Oct. 23, 1928. 1,688,746

R. J. PARSONS

TURNSTILE CONTROL MECHANISM

Filed Nov. 19, 1924

Fig. 1.

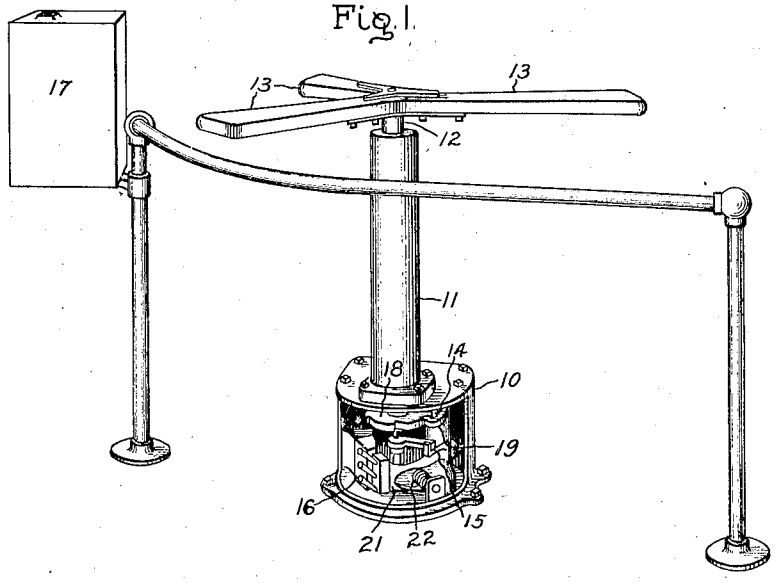
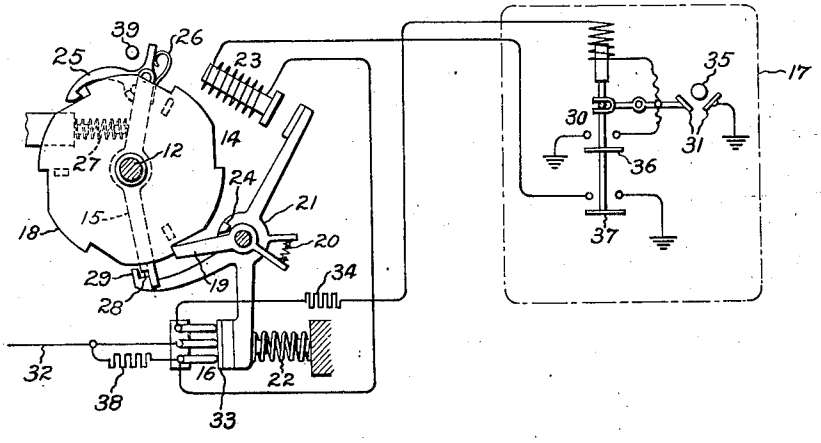


Fig. 2.



Inventor
Robert J. Parsons
by Alexander S. Lunt
His Attorney

Patented Oct. 23, 1928. 1,688,746

UNITED STATES PATENT OFFICE.

ROBERT J. PARSONS, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

TURNSTILE-CONTROL MECHANISM.

Application filed November 19, 1924. Serial No. 750,938.

This invention relates to the control of turnstiles and the like, and has for its object the provision of an improved form of control mechanism for permitting only a step by step rotation of the turnstile in one direction while at all times permitting free rotation thereof in the other direction.

Although not necessarily limited thereto, the invention is of particular advantage when embodied in an automatic turnstile which is used as both an entrance and an exit and is arranged to be freely rotated in the exit direction and coin released for limited rotation in the entrance direction.

I am aware that heretofore control mechanisms for turnstiles of the above character have been proposed which are arranged to normally lock the turnstile in the entrance direction while maintaining the turnstile unlocked in the exit direction. However, in such control mechanisms with which I am familiar, the deposit of a coin in the fare box to free the control mechanism for limited rotation of the turnstile in the entrance direction also serves to lock the turnstile against rotation in the exit direction. Hence, if for any reason the turnstile is not operated in the entrance direction, it remains locked against rotation in the exit direction. Obviously much inconvenience and even serious injury may be experienced by users of a turnstile having such a control arrangement, particularly in case of an excited rush to get out the exit.

A turnstile controlled in accordance with my invention is never locked in the exit direction and when once released for limited rotation in the entrance direction is not relocked until after the said limited rotation has occurred.

The invention may be carried into effect in a preferred form, by providing a stop mechanism such as a pawl and ratchet mechanism for preventing rotation of the turnstile in the entrance direction while permitting free rotation thereof in the exit direction and arranging a latch to hold the stop or pawl released until after a predetermined angular movement of the turnstile in the entrance direction. The pawl preferably is electromagnetically released under the control of coin actuated switch mechanism and the latch preferably is arranged to be operated by the ratchet wheel of the pawl and ratchet mechanism.

A better understanding of the invention will be had by reference to the following description taken in connection with the accompanying drawing in which Fig. 1 is a perspective view of an automatic coin controlled turnstile embodying the invention, and Fig. 2 schematically illustrates the automatic control mechanism therefor.

The novel features and combinations which I believe to be characteristic of my invention are pointed out with particularity in the appended claims.

Referring to Fig. 1, the invention is shown applied to a turnstile of the usual type having a supporting base 10, a pedestal 11 mounted thereupon, through which extends the rotatable shaft 12 which carries the spaced arms 13 upon the upper end thereof. The electrically controlled pawl and ratchet mechanism 14 for preventing rotation of the turnstile in the entrance direction together with the cooperating latch 15 and control switch mechanism 16 are suitably enclosed in the base 10 and the coin actuated control switch mechanism is placed in a suitable fare box 17.

As more clearly shown in Fig. 2, the ratchet wheel 18 is secured to the lower end of the rotatable shaft 12 and the pivoted pawl 19 is biased into engagement therewith by the spring 20. In the arrangement illustrated the pawl 19 is released by means of a pivotally supported member 21 which is biased to the position shown by the spring 22 and is arranged to be operated in a counter clockwise direction by the electromagnet 23 in order to bring the finger 24 into engagement with the pawl 19 to release the same. It will be evident however that the pawl 19 may be designed to be operated directly by the electromagnet 23 if desired.

In accordance with my invention, the pivoted latch 15 is provided for maintaining the pawl 19 released until after a predetermined angular movement of the ratchet wheel 18 in a counter clockwise or entrance direction has occurred. The latch 15, as shown, is pivotally mounted intermediate its end to rotate coaxially with the rotatable shaft 12 and carries at one end the pivotally mounted pawl 25 which is biased into engagement with ratchet wheel 18 by means of the biasing spring 26. The latch 15, is, itself, biased to rotate in a clockwise direction by the spring 27 in order to bring the shoulder 28 formed on the lower end thereof into locking engage-

ment with the lug 29 on member 21 when the latter is electromagnetically operated to release the pawl 19.

The energizing circuit of operating electromagnet 23 is under the joint control of the coin actuated electromagnetic relay 30 and the switch mechanism 16 which latter is arranged to be operated by the pivoted member 21 as shown in the drawing.

As thus constructed and arranged and with the several parts in their respective positions shown in the drawing, the operation of the turnstile is as follows: The pawl 19, being biased into engagement with the ratchet wheel 18, normally locks the turnstile shaft 12 against rotation in a counter clockwise or entrance direction although it will be evident that the turnstile may be freely rotated in the exit direction due to the fact that the pawl 19 easily rides over the notches in ratchet wheel 18 when the latter is rotated in a clockwise direction.

In order to release the pawl 19 to permit limited rotation of the turnstile in the entrance direction, a coin is deposited in the fare box 17 and completes a circuit between the coil receiving contacts 31 as indicated in Fig. 2. This establishes an energizing circuit for relay 30 extending from the conductor 32, which is connected to a suitable source of supply, not shown in the drawing, through the middle and the upper contact fingers and the bridging contact 33 of switch mechanism 16, the current limiting resistance 34, the operating winding of relay 30 and thence through the coin receiving contacts 31 and the coin 35 which bridges the same to ground. Upon the resulting response of relay 30, a holding circuit for the operating winding thereof is established in shunt with the coin receiving contacts 31 through the relay contact 36 and the left hand coin receiving contact 31 is operated to drop the coin 35 into a suitable money box. At the same time the operating electromagnet 23 is energized through a circuit extending from the conductor 32 through the middle and lower contact fingers and the bridging member 33 of switch mechanism 16, the operating winding of electromagnet 23 and the contact 37 of relay 30 to ground. Thereupon the pivoted member 21 is rotated by the electromagnet 23 in a counter clockwise direction against the bias of spring 22 and engages the finger 24 with pawl 19 and thereby moves the latter out of locking relation with the ratchet wheel 18. As the pawl 19 is thus released, the shoulder 28 of latch 15 is moved by the biasing spring 27 into engagement with the lug 29 on the member 21 and serves to maintain the latch 19 released independently of the operating electromagnet 23.

Also, it will be observed that as the member 21 is rotated in a counter clockwise direction to release the pawl 19, the bridging contact 33 of switch mechanism 16 is operated out of engagement with the contact fingers cooperating therewith, thereby inserting the resistance 38 in circuit with the operating winding of electromagnet 23 to reduce the energizing current thereof and at the same time interrupting the energizing circuit of relay 30. Thereupon relay 30 returns to the position shown in the drawing and interrupts the energizing circuit of operating electromagnet 23 through the contact 37.

With the pawl 19 thus maintained out of engagement with the ratchet wheel 18 by the latch 15, the turnstile is free to be rotated in either direction. Hence, should for any reason the depositor of the coin 35 fail to operate the turnstile in the entrance direction, nevertheless the turnstile may be freely used as an exit without disturbing the condition of the control mechanism therefor.

While not shown in the drawing it will be understood that a suitable centering device, such as for example a star wheel mechanism, may be provided for properly positioning the spaced arms 13 of the turnstile after operation thereof.

When the turnstile is rotated in the entrance direction after the release of pawl 19 in the manner previously described, the pawl 25 is engaged by the ratchet wheel 18 and after a predetermined angular movement of the latter, the latch 15 is rotated in a counter clockwise direction sufficiently to disengage the shoulder 28 from the lug 29 on member 21. This permits the spring 22 to rotate member 21 and thereby return the pawl 19 into latching relation with the ratchet wheel 18. Upon a slight additional movement of ratchet wheel 18, the pawl 25 is released from engagement with ratchet wheel 18 by the stop 39 in an obvious manner and the latch 15 returns to the position shown in the drawing under the bias of spring 27.

From the foregoing, it will be evident that as successive coins are deposited in the fare box 17, the cycle of operation just described will be repeated to permit step by step rotation of the turnstile in the entrance direction while at all times permitting free rotation of the turnstile in the exit direction.

In accordance with the provisions of the patent statutes, I have described the principle of operations of my invention together with the apparatus which I now consider to represent the best embodiment thereof, but I would have it understood that the apparatus shown is only illustrative and that the invention may be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. A turnstile control mechanism comprising a rotatable member, mechanism for preventing rotation of said member in one direction and for permitting unrestrained rotation of the member in the other direction, and electrically operated means for controlling

said mechanism to permit free rotation of said member in either direction until after a predetermined angular movement of said member in said one direction said means being unresponsive to rotation of said member in the other direction.

2. A turnstile control mechanism comprising a rotatable member, mechanism for preventing rotation of said member in one direction and for permitting unrestrained rotation of the member in the other direction, means for releasing said mechanism to permit free rotation of said member in either direction, and means responsive to rotation of the member in said one direction for maintaining said mechanism released until after a predetermined angular movement of said member in said one direction, said last means being unresponsive to rotation of the member in the other direction.

3. A turnstile control mechanism comprising a rotatable member, a pawl and ratchet mechanism for preventing rotation of said member in one direction and for permitting unrestrained rotation of the member in the other direction, means for releasing said pawl to permit free rotation of said member in either direction, a latch for maintaining said pawl released, and means operatively connected with said member to be responsive to rotation of the member in said one direction for releasing said latch upon a predetermined angular movement of said member in said one direction, said last means being unresponsive to rotation of the member in the other direction.

4. A turnstile control mechanism comprising a rotatable member, a pawl and ratchet mechanism for preventing rotation of said member in one direction and for permitting unrestrained rotation of the member in the other direction, means for releasing said pawl to permit free rotation of said member in either direction, a latch operable upon the release of said pawl to maintain said pawl released and an additional pawl and ratchet mechanism for releasing said latch after a predetermined angular movement of said member in said one direction, said additional pawl and ratchet mechanism being unresponsive to rotation of said member in the other direction.

5. A turnstile control mechanism comprising a rotatable member, mechanism for preventing rotation of said member in one direction and for permitting unrestrained rotation of the member in the other direction, electroresponsive means for releasing said mechanism to permit free rotation of said member in either direction, switch mechanism arranged to render said electroresponsive means ineffective upon the release of said mechanism, and means connected through a one-direction driving connection with said rotatable member for independently maintaining said stop mechanism released until after a predetermined angular movement of said member in said one direction.

6. A turnstile control mechanism comprising a rotatable member, a pawl and ratchet mechanism for preventing rotation of said member in one direction, electroresponsive means for releasing said pawl to permit free rotation of said rotatable member, switch mechanism associated with said pawl and arranged to be operated upon the release thereof to render said electroresponsive means ineffective, and latching mechanism controlled by said rotatable member for independently maintaining said pawl released until after a predetermined angular movement of said member in said one direction.

7. A turnstile control mechanism comprising a rotatable member, a stop biased into engagement with said member to prevent rotation thereof in one direction and arranged to permit unrestrained rotation of the member in the other direction, an electromagnet for releasing said stop to permit free rotation of said member in either direction, means for controlling the energization of said electromagnet comprising a switch arranged to be operated upon the release of said stop to de-energize said electromagnet, and a latch operatively connected through a one-direction driving connection with said rotatable member for maintaining said stop released until after a pedetermined angular movement of said member in said one direction.

8. In an electrically controlled turnstile, the combination of a rotatable shaft, a ratchet wheel secured to said shaft, a pivotally supported pawl biased into engagement with said ratchet wheel to prevent rotation of said shaft in one direction and arranged to permit unrestrained rotation of the member in the other direction, an electromagnet for releasing said pawl to permit free rotation of said shaft in either direction, a latch biased to maintain the said pawl released independently of said electromagnet, and a second pawl operatively associated with said ratchet wheel for releasing said latch upon a predetermined angular movement of said shaft in said one direction.

9. In an electrically controlled turnstile, the combination of a rotatable shaft, a ratchet wheel secured thereto, a pivotally supported pawl biased into engagement with said ratchet wheel to prevent rotation of said shaft in one direction, an electromagnet for releasing said pawl to permit free rotation of said shaft in either direction, means for maintaining said pawl released comprising a pivotally supported latch a second pawl associated with said pivotally supported latch to be responsive to rotation of said ratchet wheel in said one direction and arranged to operate the latch to release said first pawl upon a predetermined angular movement of said ratchet

wheel in said one direction, and means for releasing said second pawl upon the completion of said predetermined angular movement of said ratchet wheel in said one direction.

10. In an electrically controlled turnstile, the combination of a rotatable shaft, a ratchet wheel secured thereto, a pivotally supported pawl biased into engagement with said ratchet wheel to prevent rotation of said shaft in one direction, and means for operating said pawl to permit step by step rotation of said shaft in said one direction comprising a movable member biased to one position and operable to another position to release said pawl, an electromagnet for operating said member to said other position, a switch for controlling said electromagnet and arranged to be operated to deenergize said electromagnet upon the operation of said member to said other position, a pivotally supported latch biased into latching engagement with said member to maintain the same in said other position, and means operatively connecting said ratchet wheel with said latch to operate the same out of said latching relation upon a predetermined angular movement of said wheel in said one direction.

In witness whereof, I have hereunto set my hand this 18th day of November, 1924.

ROBERT J. PARSONS.