W. E. STRATTON.

TURNSTILE.

APPLICATION FILED MAR. 30, 1909.

949,384. Patented Feb. 15, 1910.

3 SHEETS—SHEET 1.

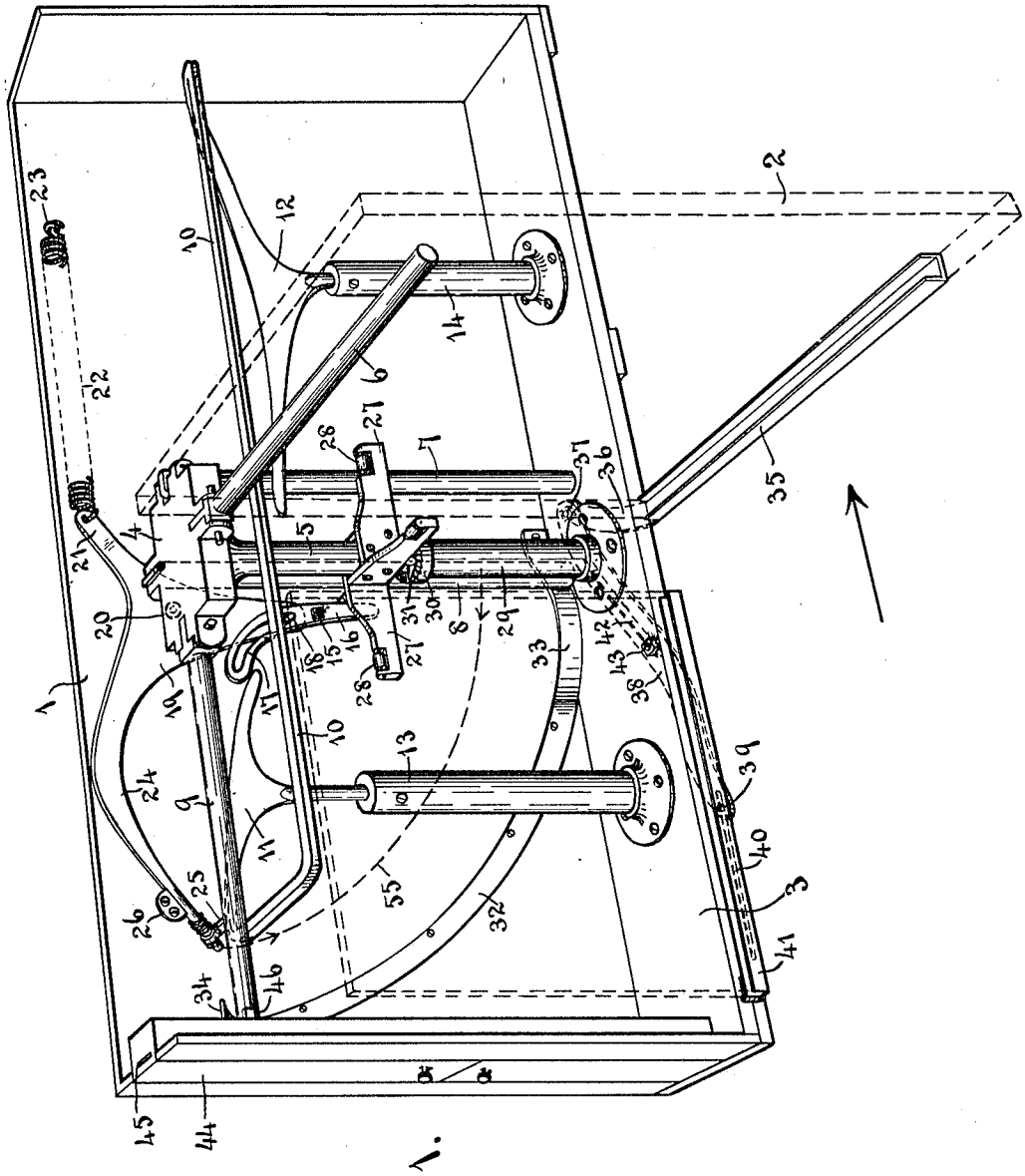

Fig. 1.

WITNESSES:

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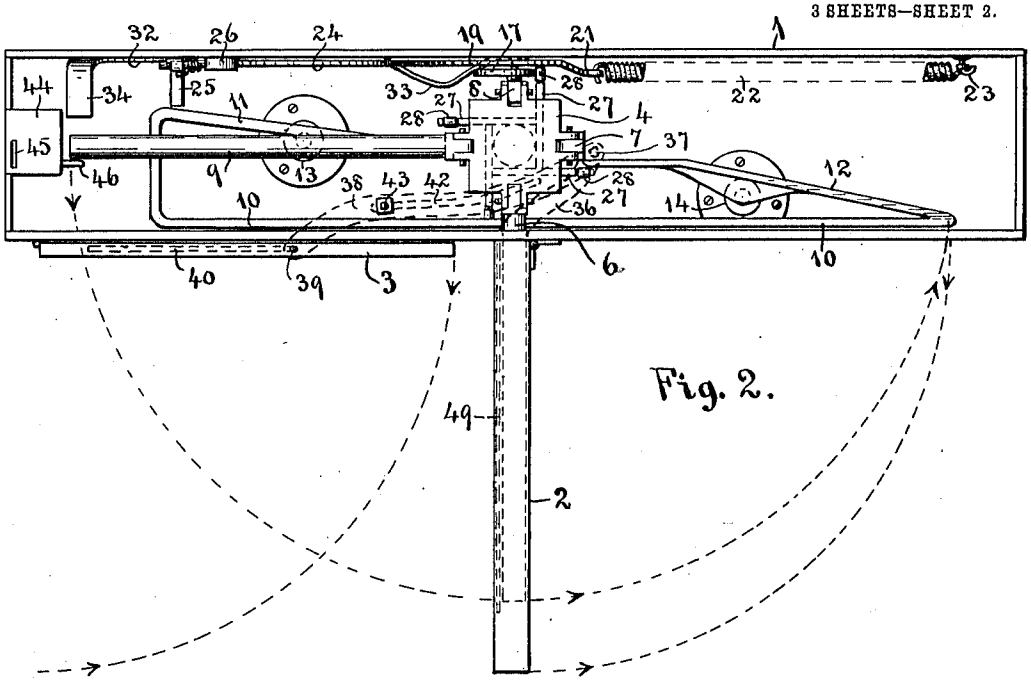

Fig. 2.

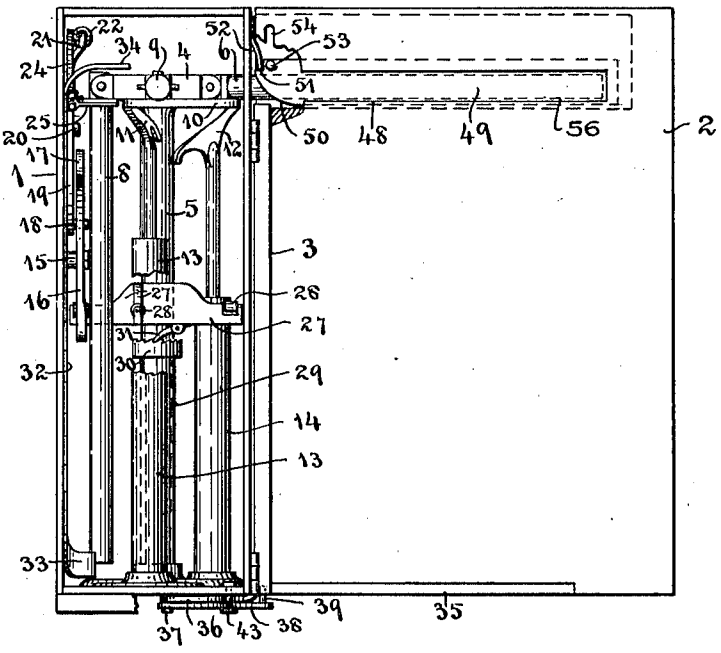

Fig. 3.

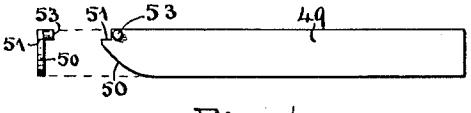

Fig. 6.

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3 SHEETS—SHEET 3.

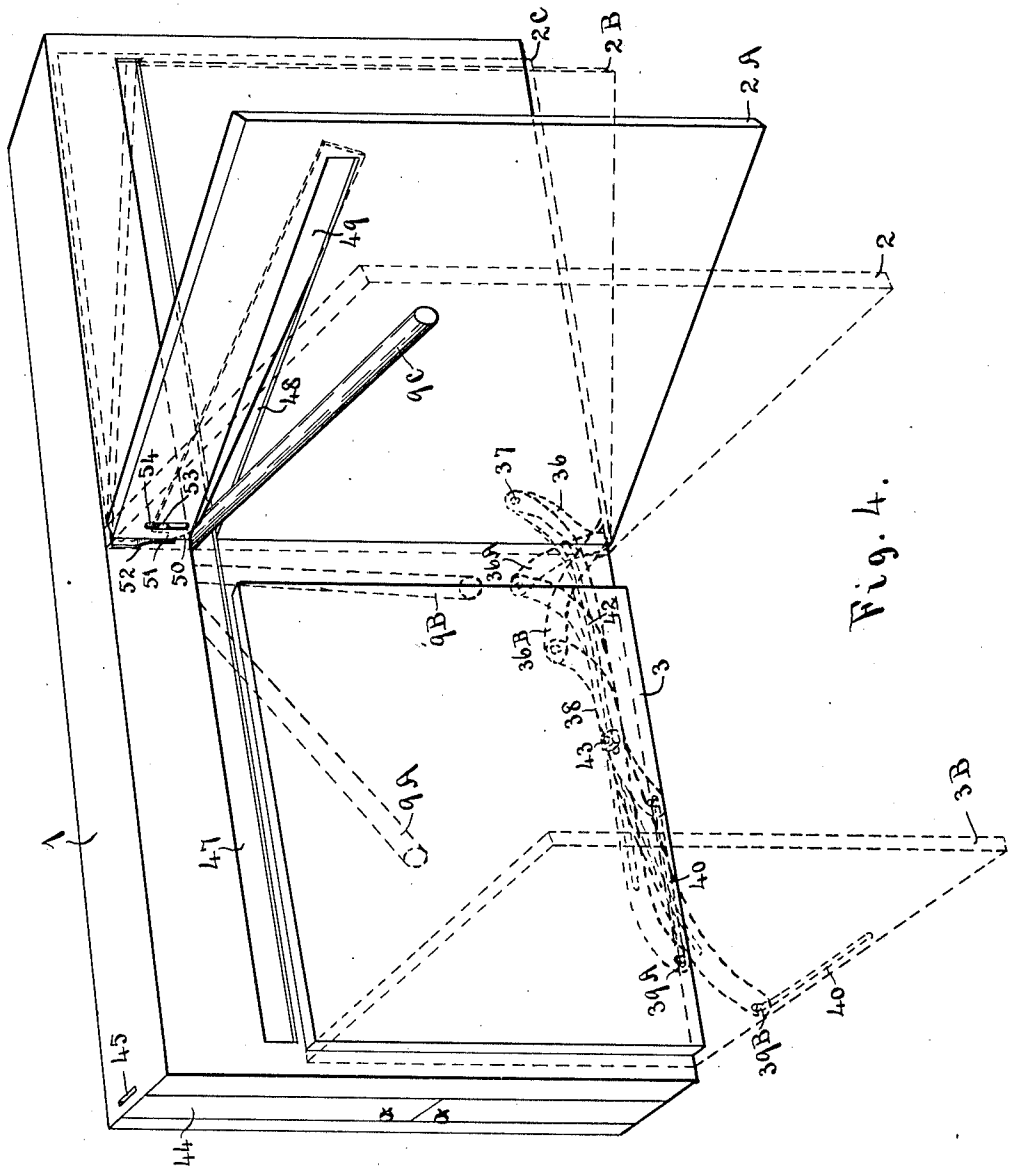

Fig. 4.

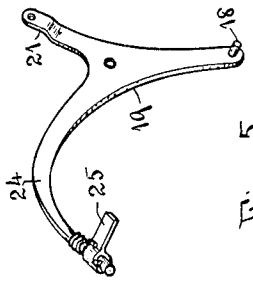

Fig. 5.

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UNITED STATES PATENT OFFICE.

WALLACE E. STRATTON, OF NEW YORK, N. Y.

TURNSTILE.

949,384. Specification of Letters Patent. Patented Feb. 15, 1910.

Application filed March 30, 1909. Serial No. 486,772.

To all whom it may concern:

Be it known that I, WALLACE E. STRATTON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Turnstiles, of which the following is a specification.

This invention relates to improvements in coin controlled turnstiles, whereby the collection of fares on street cars, subway and elevated railroads, and the price of admission to places of amusement, where a coin of a single denomination is charged, will be automatically made without loss.

My object is to provide a turnstile of this character which will take up the least possible room, in order that it may be positioned in narrow passageways: to so arrange the mechanism that it may be contained in a narrow case, adapted to be fitted into the end walls of a car or into or against the wall of a building entrance, or the like: and, finally, to provide a combination of turnstile bars and doors whereby the passage of more than one person at a time will be effectually prevented, and which will not inconvenience a person in passing through any more than would an ordinary swing door, except for the slight pause required to insert a coin to release the mechanism.

I attain my objects by constructing the turnstile in the manner illustrated in the accompanying drawings, in which—

Figure 1 presents a perspective view of the turnstile mechanism, with the front and top of the case removed, and the doors shown in broken lines; Fig. 2, a plan view thereof with the top of the case removed; Fig. 3, an end view looking from left to right in Figs. 1 and 2, with the end of the case and box containing the coin mechanism removed; Fig. 4, a perspective view showing the closed case and the doors turned in several positions to illustrate the relative movements of the doors and turnstile bars; and Figs. 5 and 6, details of the bar elevating lever and the main door slot shutter, respectively.

Like numerals designate like parts in the several views.

The mechanism is inclosed within a narrow oblong case 1, the width inside of which need not be over eight inches. At the outward side of the case a door 2 is hung on spring hinges midway between the ends to swing in the direction indicated by the arrow; and a second door 3 is hinged to the case at the end of approach, this second door being lower than the first to permit the turnstile bars to pass over it. Within the case is a turnstile-head 4, carried upon a revoluble standard 5. Attached to this head are four bars, 6, 7, 8, and 9, by pivotal connections, so that they may swing from horizontal position downward into vertical position, and up again to horizontal position, as they pass through the case. A guide rail 10 supports these turnstile bars when in horizontal position; said rail having downwardly inclined return bends at 11 and 12, to guide the rise and fall of the arms in passing through the case. The rail ends 11 and 12 are supported on the standards 13 and 14, respectively.

Pivotally mounted at 15 on the back of the case is a lever 16, provided with a curved cam slot at 17, in engagement with which is a pin 18, on a three arm oscillating lever 19, which is pivoted at 20 on the back of the case. The arm 21 of this lever is coupled to a spring 22, attached at 23 to the back of the case; and the third arm 24 is provided at its end with a spring actuated arm 25, standing at right angles to the arm 24, and adapted to be turned about the arm against the tension of the spring, when passing to the rear of a turnstile bar, as will presently appear. A stop block 26 is fastened to the back of the case to limit the motion of arm 24 in its upward throw. Around the standard 5 there are fastened four arms 27, projecting out from one another at angles of 90°, and provided at their outward ends with rollers 28, which, as the standard revolves are brought into engagement with the lower end of the lever 16.

The fixed support 29, upon which the revoluble standard 5 is mounted, is provided at 30 with ratchet teeth, in engagement with which is a pawl 31, carried by one of the arms 27, whereby the backward rotation of the standard is prevented.

The lower ends of the turnstile bars, as they rise from vertical to horizontal position, engage the curved metal track plate 32, fastened to the back of the case, said track being provided at its lower end with an outward curve 33; and being bent over at its upper end at 34, for purposes hereinafter described.

The door 2 has its lower edge set into a

metal channel piece 35, from which a curved arm 36 projects under the bottom of the case, where it is coupled at 37 to a bar 38; the outward end of said bar 38 being provided with an upwardly projecting pin 39, to engage a slot 40 provided therefor in the bottom edge of the door 3, said slot being preferably formed in a metal channel piece 41, into which the door is fitted. The bar 38 is slotted at 42 to slide upon a pin 43 fastened to the bottom of the case.

The coin mechanism is contained in a box 44, provided at its upper end with a coin slot 45, said mechanism being adapted to release a latch 46, which normally stands across the path of the turnstile bars. Any suitable coin controlled mechanism may be employed for operating this latch.

The outward side of the case is provided with a slot 47, through which the turnstile bars pass out from and back into the case, as they rotate. The door 2 is also provided with a slot at 48, through which the bars pass. Within a space 56 provided therefor in the door, on the side of approach, as indicated by the broken lines in Figs. 2 and 3, is a vertically movable shutter 49, which is adapted to drop down after a bar has passed beyond it through the slot 48, to prevent the door from moving forward until the turnstile bars are released by the coin mechanism. This shutter, at its inward end, is cut on an incline at 50, which incline, when the door 2 swings back to its normal position across the passageway, rides up the then projecting turnstile bar, thereby causing the shutter to rise up and pass over the bar. The shutter is notched at 51 to receive the end of a flat spring lock 52, which projects into the shutter space in the door to engage said notch when the door is in closed position. When the door is pushed open, the end of the shutter is turned away from engagement with the lock and is released, so that it may be free to ride over the next turnstile bar, when the door is again closed. The shutter at its inward end is also provided with a pin 53, which engages a vertical slot 54 in the door, to prevent endwise motion of the shutter and permit it to tilt as it rides over the bars.

The operation of the turnstile is as follows: After depositing a coin in the slot 45, and thereby releasing the mechanism, the person passing the turnstile pushes the door 2, as he would an ordinary swing door. This sets the mechanism inside the case in operation; the rotation of the bar 6 with the door 2 rotating the turnstile-head, and with it the other bars, and also the arms 27. This causes one of said arms 27 to turn the cam lever 16, and through it the lever 19, thereby causing the outward end of arm 24 on said lever to travel downward on the curve indicated by the broken lines 55 in Fig. 1. As this arm 24 descends, the spring arm 25 meets the turnstile bar 8, which is then moving in the opposite direction, the spring permits the arm to turn and pass by the bar 8, the bar being held from swinging outward from the standard, so as to interfere with the passage of the arm, by the outward curve 33 on the track 32. After the arm 25 has passed back of the bar 8, it will spring back into position to engage the bar, and at the same time the lower end of cam lever 16 will be released from engagement with the roller on arm 27, which will have passed completely under said arm, thereby freeing lever 19, which, under the action of spring 22, will be thrown back into its normal position. During this return movement of the lever the arm 25 will press bar 8 forward and upward, thereby rotating the turnstile bars, and positioning the end of the bar 8 in line with the top of the guide rail 10, the bar being prevented from being thrown above this position by means of the curve 34 at the top of the track 32 and being guided in its upward travel by track 32 on the one side and the portion 11 of the guide rail 10 on the other side. The bar 6 will then have passed back into the case, and onto the downwardly inclined portion 12 of the rail 10, down which it will slide of its own weight into the position before occupied by the bar 7, thereby effecting the completion of the quarter turn; bar 7 being carried around to the position of bar 8, and the bar 9 being turned out of the case into the position of bar 6. Bar 8 will thus be brought into engagement with the latch 46 of the coin mechanism, and further operation of the turnstile will be prevented until another coin has been deposited. By this manner of operation, the bars are in horizontal position through 180° of their travel, or throughout their movement through the passageway. During this movement of the turnstile bars the doors 2 and 3 will operate conjointly therewith as follows:—When the door 2 arrives in the position indicated at 2^A in Fig. 4, the turnstile bar 9 will have passed out through slot 47 into position 9^A, and the pin 39 on bar 38 will have passed along slot 40 in door 3 to the position 39^A, where it engages the end of the slot. Further movement of door 2 will then cause an opening of the door 3, and when door 2 is in position 2^B, door 3 will have been thrown across the passageway into position 3^B, and the bar 9 will have assumed the position 9^B. When the door 2 arrives at the position 2^A it will be noted that the bar 9, being at right angles to the bar 6, which is being carried forward with the door 2, will project into the passageway sufficiently to block the way against a person following. As, in this position 2^A, the door 2 will not permit the first person to pass out of the pas-

sageway, he must further open the door, and as he does so the door 3 is thrown backward against the next person to follow, thereby forcing him back out of the passageway, should he attempt to pass through with the first person. The action of the door 2, in turning from 2^A to 2^B, is to suddenly and quickly throw the door 3 backward across the passageway, and door 3 will be held across the passageway during any further movement of door 2 beyond position 2^B, if required to permit the passage of the first person completely through the passageway; in other words, during the turning of door 2 from position 2^B to 2^C, where it is completely open. As soon as door 2 is released it swings back into position across the passageway at right angles to the case, and during its backward swing it throws the door 3 to normal open position. As the door 2 swings back, the shutter 49 at its inward end will be brought into engagement with the bar 9, which is then in position at right angles across the passageway; and the shutter will rise and slide over the bar in the manner illustrated in the full line position of the door in Fig. 4. As soon as the door is back in its closed position, the shutter will drop down in rear of the bar 9, so that the door cannot be pushed open until the turnstile bars are released by the coin mechanism. As soon as the shutter is dropped into position in rear of the bar, the spring lock 52 will engage notch 51 on the shutter, thereby preventing the shutter from being raised to release the door. The turnstile bars cannot be lifted or depressed while moving through the passageway and there is not room for two persons to pass through between bars. Should a person attempt to crawl under a bar behind another person preceding, or to squeeze by the end of the bar, he will be caught and held by the door 3, which must close before the person preceding can open door 2 sufficiently to even squeeze himself through.

Having thus described the features of construction involved in my invention, and without confining myself to any specific details thereof, what I claim as my invention and desire to secure by Letters Patent is—

1. A turnstile comprising a plurality of bars pivotally mounted upon a revoluble standard, means whereby each of said bars consecutively will be made to travel in a horizontal plane during a portion of its revolution, means whereby the bar will be allowed to drop to vertical position and so remain during a further portion of its revolution, and means operated by the turning of the standard whereby the bar will be elevated in a substantially vertical plane to horizontal position during the remainder of its revolution.

2. A turnstile comprising a case provided with a horizontal slot across one side, a revoluble standard within the case centrally located with relation to the slot, bars pivotally mounted upon said standard, means whereby the bars in succession will be made to travel in a horizontal plane and through said slot during substantially one-half of a revolution, and means for permitting the depression of the bars and means for elevating the bars in substantially vertical planes within the case during the remainder of a revolution.

3. A turnstile comprising a case provided with a horizontal slot across one side, a revoluble standard within the case centrally located with relation to the slot, bars pivotally mounted upon said standard, means whereby the bars in succession will be made to travel in a horizontal plane and through said slot during substantially one-half of a revolution, means for permitting the depression of the bars and means for elevating the bars in substantially vertical planes within the case during the remainder of a revolution, a swing door hinged to the side of the case in alinement with the standard, said door normally standing, when closed, at right angles to the case and adapted to be opened in the direction of rotation of the bars, a slot in said door through which the bars will pass, a shutter within the door adapted to drop down behind a bar when within the slot, means whereby the shutter will be raised to permit the passage of a bar upon the return of the door to closed position, and a lock and releasing device for limiting the movements of the bars to consecutive quarter revolutions.

4. A turnstile comprising a revoluble standard positioned at one side of a passageway, bars on the standard adapted to rotate in horizontal position through the passageway, a swing door hinged at the side of the passageway adjacent the standard, said door normally standing across the passageway in alinement with the standard and adapted to be opened in the direction of rotation of the bars, a slot in said door through which the bars will pass, means for closing said slot behind a bar when within the slot, means for opening the slot to receive the next bar when the door returns to closed position, and means for locking and releasing the bars at each quarter revolution thereof.

5. A turnstile comprising a revoluble standard positioned at one side of a passageway, bars on the standard adapted to rotate in horizontal position through the passageway, a swing door hinged at the side of the passageway adjacent the standard, said door normally standing across the passageway in alinement with the standard and adapted to be opened in the direction of rotation of the bars, means whereby said door will open in conjunction with the quarter turn of a bar,

a second door hinged to swing outwardly from the side of the passageway against the direction of travel, said door being positioned to the rear of the first door and below the line of travel of the bars, and means actuated by the first door when partially opened to throw the second door across the passageway.

6. The combination, with a turnstile, of a door normally standing across the passageway controlled by the turnstile in alinement with the axis of the turnstile, said door being hung to open in the direction of rotation of the turnstile bars, means whereby said doors will open only in conjunction with the quarter turn of a bar, a second door positioned to the rear of the first door and normally standing open, and means whereby the opening of the first door will cause the second door to close across the passageway against the direction of travel and whereby the return of the first door to closed position will open the second door.

7. The combination, with a turnstile, of a door normally standing across the passageway controlled by the turnstile in alinement with the axis of the turnstile, said door being hung to open in the direction of rotation of the turnstile bars, a slot in said door to permit the passage therethrough of a turnstile bar, a vertically movable shutter in the door adapted to close the slot behind a bar when the door is in closed position, means for locking the shutter when closed, said locking means being released from the shutter when the door opens, and means whereby the shutter will be raised to permit the passage through the slot of a following bar when the door returns to closed position.

8. The combination, with a turnstile, of a door normally standing across the passageway controlled by the turnstile, a second door to the rear of the first door normally standing open against the side of the passageway adjacent the turnstile, a lever on the first door, a bar coupled to said lever at one end and at the other end to the second door by a pin and slot joint, a fixed guide pin engaging a longitudinal slot in said bar whereby, after the first door has been opened part way, its further opening will act to throw the second door across the passageway against the direction of travel, and means whereby the first door will open only in conjunction with the quarter turn of a turnstile bar.

9. A turnstile comprising a revoluble standard, bars pivotally mounted upon the head of the standard, a horizontal guide rail upon which the bars ride in horizontally extended position through a portion of a revolution, a drop at one end of the guide rail whereby the bars are permitted to swing down into vertical position and to remain during a further portion of a revolution, and means independent of the guide rail operated by the turning of the turnstile during the last portion of a revolution of each bar for elevating the bar and depositing it upon the guide rail.

10. A turnstile comprising a revoluble standard, bars pivotally mounted upon the head of the standard, a horizontal guide rail upon which the bars ride in horizontally extended position through one-half of a revolution, a drop at one end of the guide rail whereby the bars are permitted to swing down into vertical position, an oscillating lifting lever having a laterally projecting spring actuated arm positioned to swing down past the bars at the beginning of their last quarter revolution and to engage the bars from behind, a cam lever pivoted below the lifting lever and provided with a cam slot, a pin on the lifting lever in engagement with said slot, arms projecting from the standard and adapted to engage the free end of the cam lever and through said lever to depress the lifting lever, said arms releasing the cam lever when the lateral spring arm on the lifting lever is in position behind a turnstile bar, a spring acting to return the lifting lever to normal position and thereby raise the bar to horizontal position, and guides at each side of the bar during this portion of its travel to maintain it in engagement with the lifting lever.

11. A turnstile comprising a revoluble standard positioned at one side of a passageway, bars pivotally mounted upon the head of the standard, a horizontal guide rail between the standard and the passageway and extending in both directions from the standard parallel to the passageway, a right angle inward bend and a downwardly inclined return bend at one end of the rail, a downwardly and inwardly inclined bend at the other end of the rail, and mechanism operated by the turning of the standard to elevate the bars consecutively into horizontal position and deposit them upon the inward horizontal bend of said rail at the one end, said bars sliding down the incline at the other end of the rail to hang vertically until brought into position to be engaged by said elevating mechanism.

In testimony whereof I have affixed my signature, in presence of two witnesses.

WALLACE E. STRATTON.

Witnesses:
GEO. A. CHAPMAN,
E. J. STICH.