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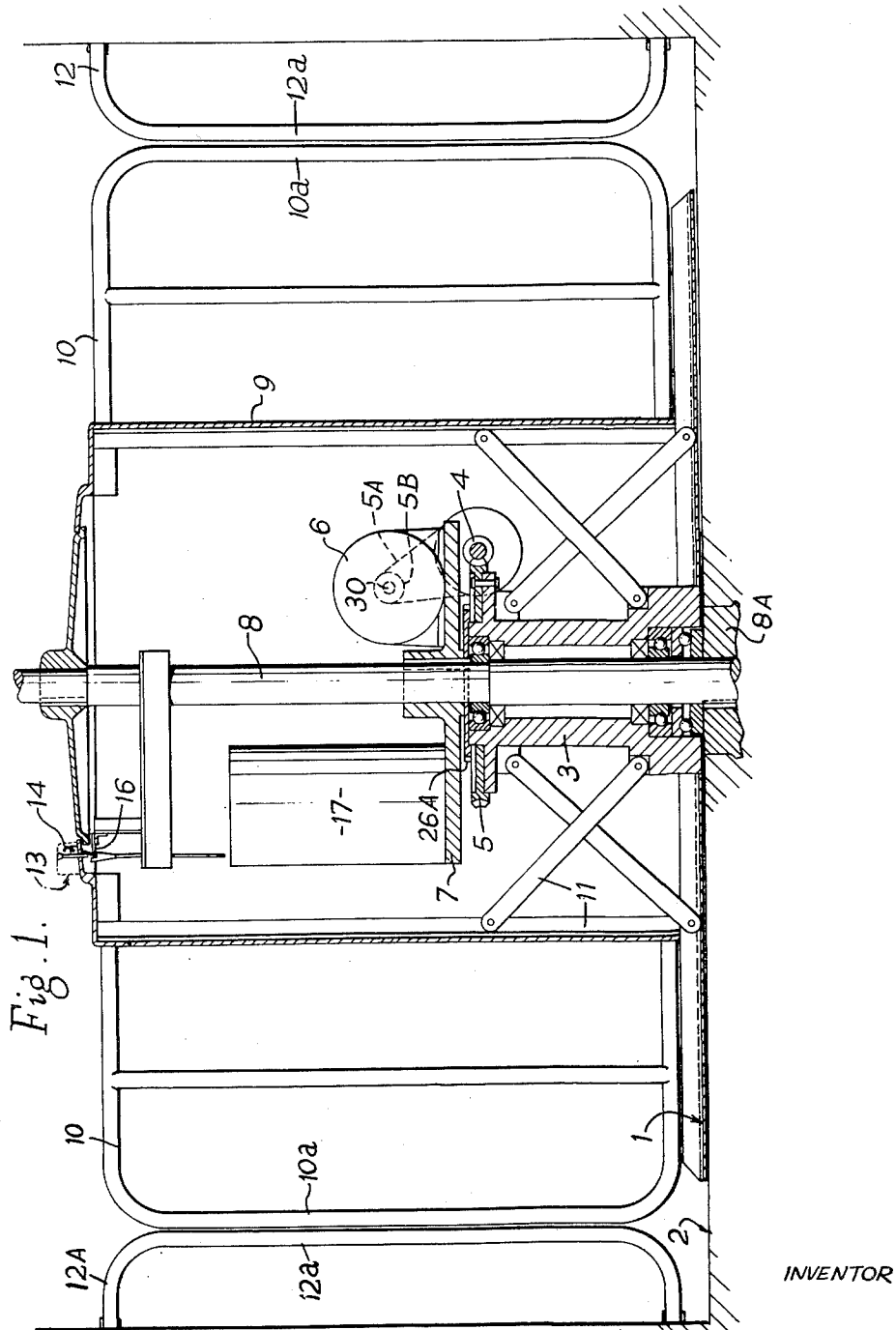
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3,019,539

TURNSTILES

Filed Aug. 5, 1960

6 Sheets-Sheet 1



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TURNSTILES

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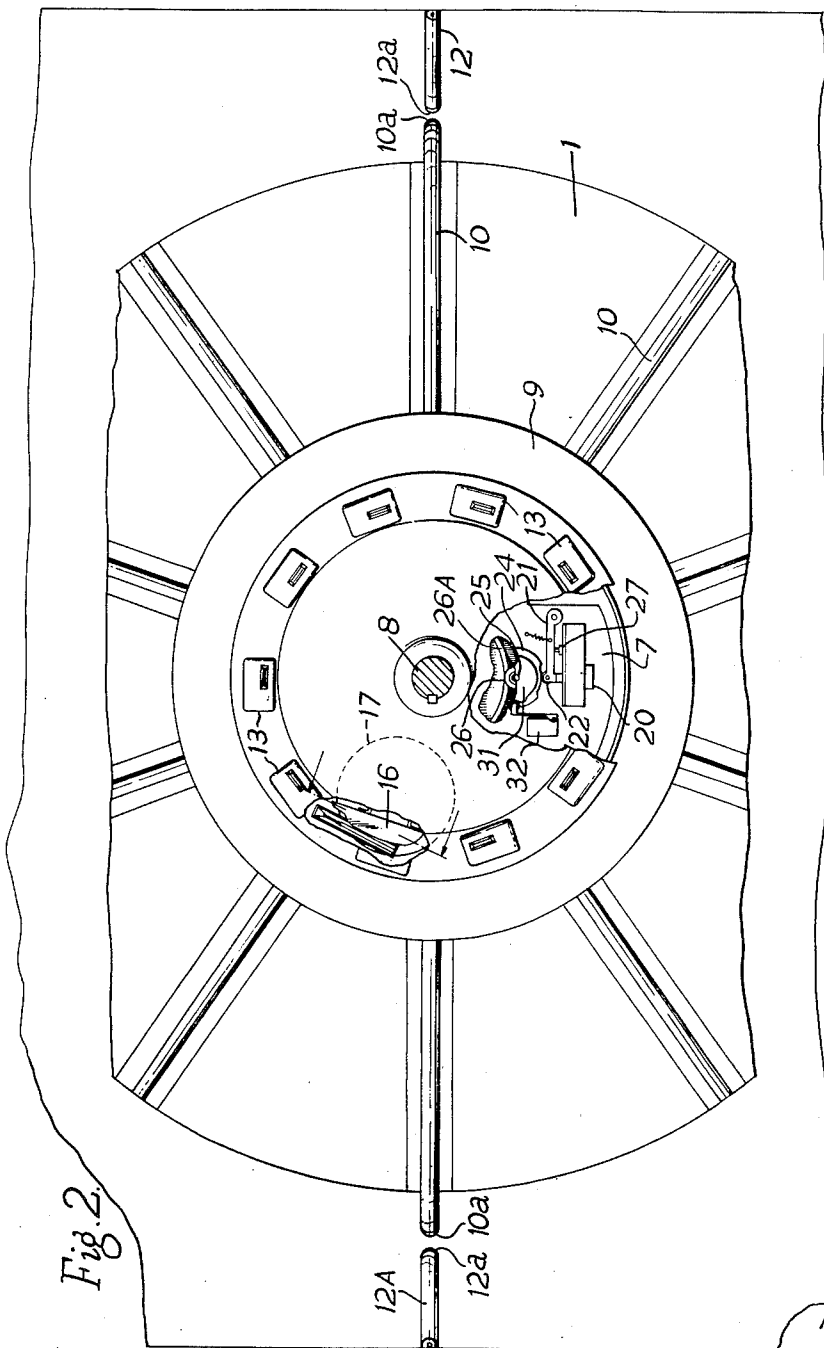


Fig. 2

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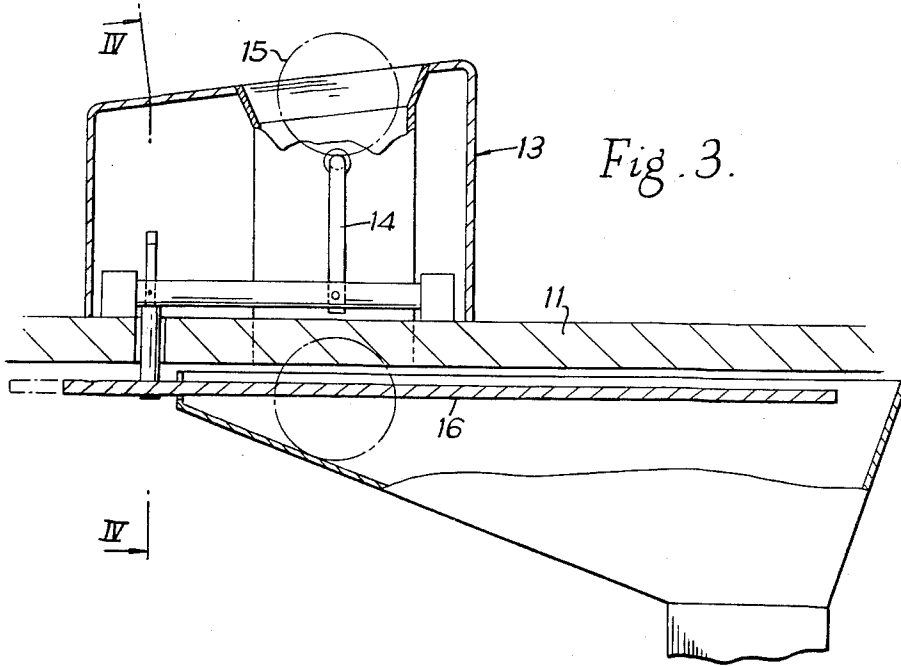


Fig. 3.

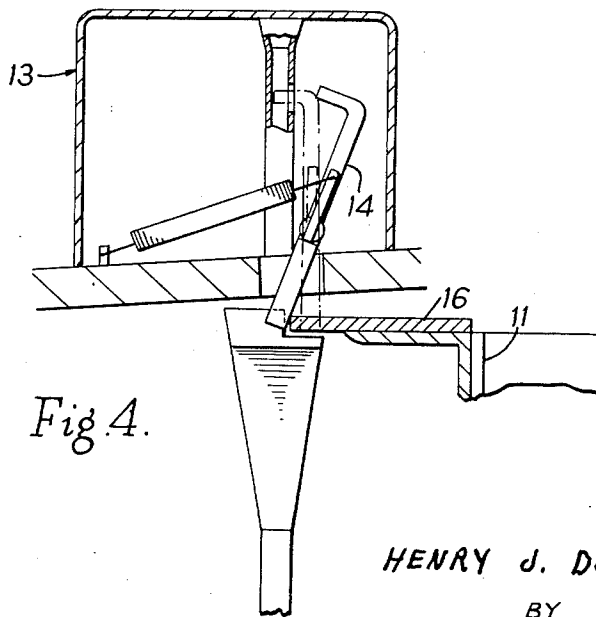


Fig. 4.

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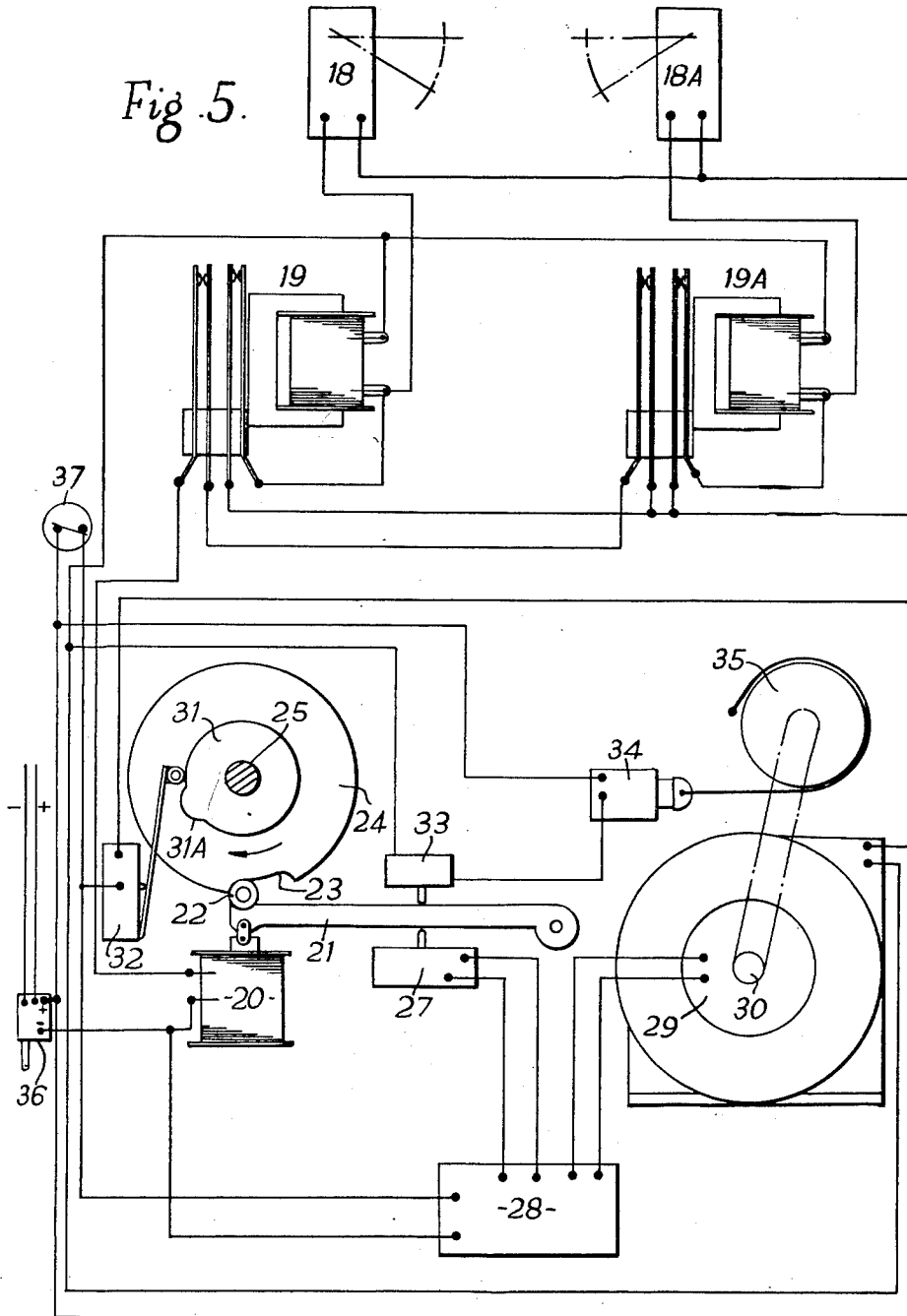
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TURNSTILES

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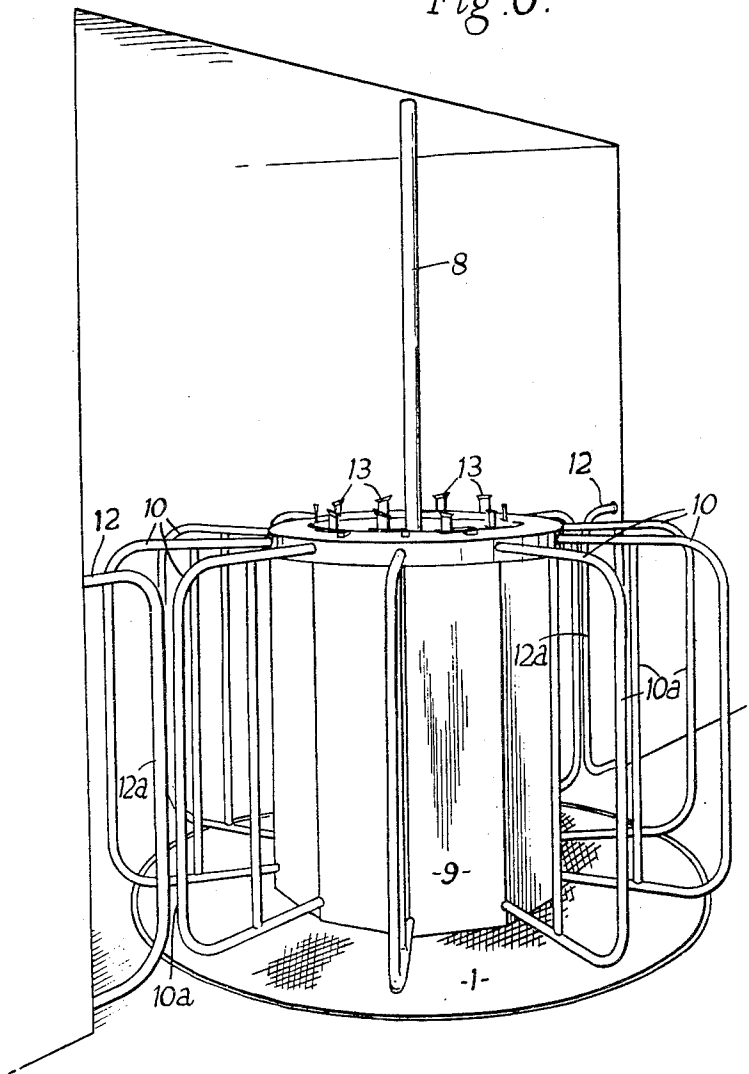
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Fig. 6.



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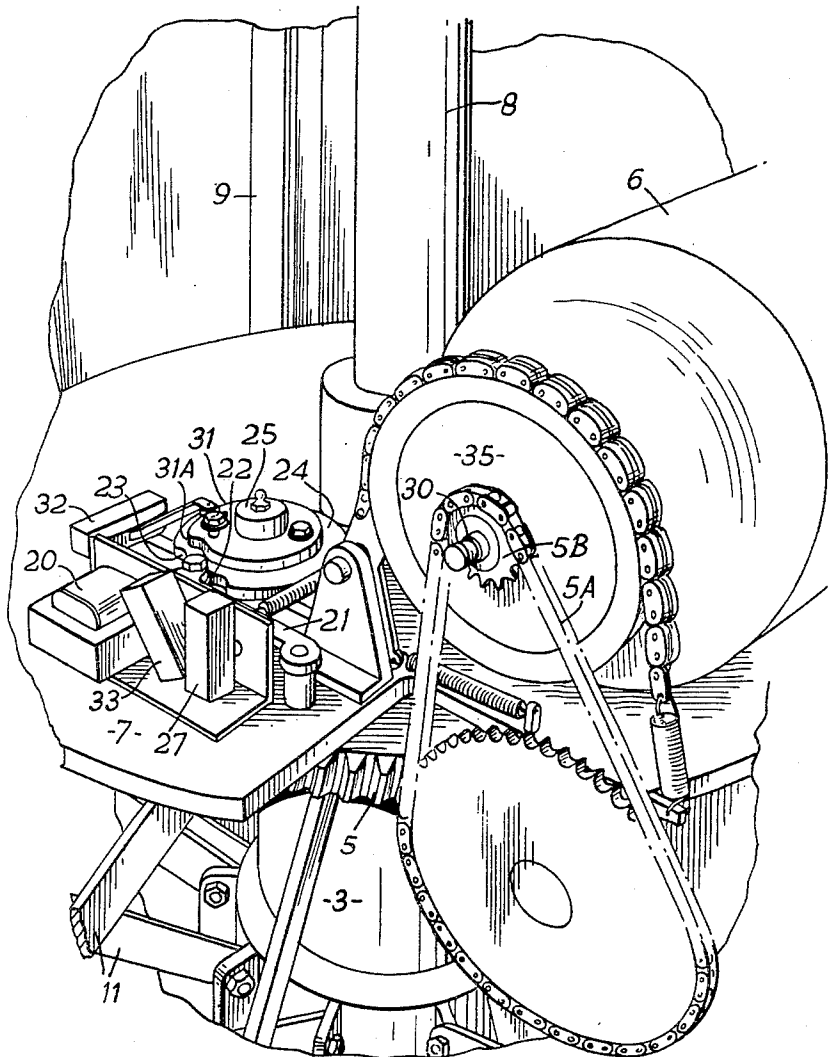
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Fig. 7.



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TURNSTILES

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Claims priority, application Great Britain Aug. 12, 1959  
4 Claims. (Cl. 39—3)

This invention relates to turnstiles, particularly those employed for regulating entrance to playing grounds and other enclosures attended by large numbers of persons.

The main object of the present invention is to provide improved forms of turnstiles which are adapted to increase materially the rate of passage of persons there-through.

Another object of the present invention is to provide a turnstile installation comprising a turnstile in combination with a turntable set level with the ground so that persons can be conveyed thereby through a barrier associated with the turnstile, at a much higher rate of passage than possible when a turnstile revolves in accordance with the rate of passage of persons walking through the turnstile.

A further object of the invention is to provide such an installation, so constructed that when the turnstile is not operating with a continuous run of passengers, individual people may admit themselves singly without having to have an attendant present.

This turnstile-turntable is adapted normally to be rotated by power means. Each compartment moving one position forward as the appropriate coin or coins are released at the entrance position, but continuity of motion is provided for by the sequence of the insertion of the coin or coins operating suitable control mechanism which may be located adjacent the compartment following the entrance position. An over-riding control is preferably provided which may be applied as required by an attendant.

An embodiment of the invention is illustrated, by way of example, in the accompanying drawings, wherein:

FIGURE 1 is a vertical cross-section through the turnstile-turntable and

FIGURE 2 is a plan view thereof,

FIGURE 3 is a longitudinal section through a coin receiving unit and

FIGURE 4 is a cross-section on line IV—IV of FIGURE 3,

FIGURE 5 is a diagram of an electrical control system,

FIGURE 6 is a perspective view of the complete turnstile installation and

FIGURE 7 is a perspective view looking at turnstile-turntable driving and control mechanism which is housed within a casing rotating with the turntable and from which casing the turnstile arms radiate.

In the embodiment of the invention illustrated a turntable 1 is mounted for rotation substantially at ground level about a vertical shaft 8, firmly fixed in a base plate 8A which is approximately flush with the ground. A rotary motion may be imparted to the hub 3 of the turntable 1 through a worm pinion and a worm-wheel 4, 5 respectively, via a chain 5A and a clutch sprocket 5B from an electric motor 6. The motor 6 is mounted on a platform 7 secured to the fixed vertical shaft 8 which may be steadied at its upper end as shown in FIGURE 6, by a bridge member 3B forming part of a barrier structure.

The platform 7 with the motor 6 supported thereon is housed within a casing 9 carried by said hub 3 and outside the casing radially extend a plurality of turnstile arms 10 (for example, ten arms) to provide between them

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ten passenger compartments, the floors of which are constituted by the upper face of the turntable 1.

The turnstile arms 10 are secured to the casing framework 11 so that the casing 9 and arms 10 move together, being supported by the turntable hub 3, so as to move in unison with the turntable 1. The radial turnstile arms 10 preferably extend at least out to the periphery of the turntable 1 and as the arms 10 rotate the outermost substantially vertical limbs 10a thereof are carried just clear of similar vertical limbs 12a of two barriers 12, 12A set alongside of the turnstile-turntable.

The two barriers 12, 12A are conveniently disposed one on each side of the turnstile and normally in a common diametrical plane, one or both of said barriers preferably being spring mounted so as to yield slightly to pressure in one direction; that is, on both the entrance and exit sides of the turnstile the barriers yield slightly only in the same direction as that of turnstile rotation, which would usually be anticlockwise. The yielding of the said barrier is to provide means for operating a cut-out switch 37 (see FIGURE 5) in case of a person becoming trapped between the turnstile arms and the barrier 12A.

Coin control of a turnstile-turntable according to this invention may be effected by associating with each passenger compartment its own coin slot which partakes of the turntable movement and thus remains always in the same position relatively to the appropriate turnstile compartment.

Alternatively a single coin slot may be provided into which each of the passengers in the passing turnstile compartments must insert the appropriate coinage in order to prevent arresting of the rotation of the turntable.

In either case it is provided that if a passenger neglects to insert the required entrance charge into the appropriate coin slot the turnstile will automatically stop before the compartment he is occupying passes the barrier 12A.

One form of the first kind of coin control referred to above is illustrated in the drawings in which a plurality of coin receiving units 13 are provided, one to each turnstile compartment, all of which have a common till adjacent a single release point. Each coin receiving unit 13 comprises a pivoted support 14 (FIG. 4) which temporarily retains coin 15 (that is, one or more coins) in a partially inserted position, enabling the turnstile passenger to withdraw the coin at any time prior to reaching a point of common coin discharge, whereat a fixed cam plate 16 effects tilting of the pivoted support 14 of the oncoming unit to release the coin 15 for operating the appropriate switch or switches to either start the turnstile or to maintain rotation, if already running, after passing through any desired coin check operation, the coin then dropping into common till 17.

Continued rotation of the turntable is preferably made dependent on the insertion of the appropriate coinage in sequence in the coin receiving units by means of an electrical control system, of which one form will now be described. A suitable electrical control system is illustrated diagrammatically in FIG. 5, parts of the operating mechanism being shown also in FIG. 2.

The particular control system illustrated makes provision for a further feature, that is, the case where the required gate money is of a value that needs to be met by two or more coins, usually of dissimilar size and possibly requiring different kinds of checking for acceptance. The two coins payable by each passenger may be inserted in a single coin slot or in separate coin slots, and on release from the coin receiving unit operate respectively two series-connected switches diagrammatically represented as 18, 18A in FIG. 5, which bring about energisation of series-connected self-holding relays 19, 19A respectively.

Energisation of both relays 19, 19A is necessary in this case for operation of the system, but it will be readily understood that for one-coin operation all that is necessary is to isolate (or remove) one of the switches 18 or 18A and its associated relay 19 or 19A.

Operation of the relays 19, 19A effects in turn the energisation of a solenoid 20 to cause rocking of a pivoted lever 21 resulting in retraction of a detent roller 22 from a notch 23 in a disc cam 24 keyed to a spindle 25. The spindle 25 is driven through a pinion 26 (FIG. 2) from the turntable gearwheel 26A at a 1:10 ratio, that is, the disc cam 24 makes one complete revolution for each one-tenth of a revolution of the turnstile, and since the turnstile has ten passenger compartments, one revolution of disc corresponds to the angular distance between successive compartments.

The lever 21 when rocked closes a normally-open switch 27, which, through a suitable rectifier and control box 28 actuates an electro-magnetic clutch 29 which engages the output shaft 30 of the electric motor 6 which is in continuous rotation, whereupon rotary motion is imparted to the turnstile-turntable through the gearing 4 and 5, via chain 5A driven by sprocket 5B attached to clutch 29. The lever 21 and switch devices operated thereby or associated therewith are supported by the platform 7.

When cam disc 24 has turned the length of notch 23, roller 22 will ride on the outer edge of disc 24, thus preventing lever 21 from moving forward and releasing switch 27 and also from making switch 33. The turnstile therefore, must keep turning until the notch 23 can re-engage roller 22. Meanwhile cam 31 turning with disc 24 re-releases relays 19 and 19A by breaking switch 32, the switch being reset as the lobe 31A passes through. The control circuit is then in a condition to receive the coins for the next operation. If the next coin is received before notch 23 re-engages roller 22 solenoid 20 will be energised thus preventing roller 22 dropping in notch 23 and thus allows turnstile to continue turning as long as the sequence is maintained. The movement of lever 21 also allows of, or effects opening of a normally closed switch 33 in circuit with solenoid 34 which applies a brake 35 to the clutch 29 to prevent spinning of drive to worm 4 via chain 5A and thus over run of turnstile past the barrier if coin has not been inserted.

It should be noted that switch 33 is made as switch 27 is broken, thus when clutch 29 is disengaged, the brake 35 is applied to prevent over run.

I claim:

1. A turnstile installation comprising a barrier structure including a pair of side wings defining an opening; a combined turnstile-turntable structure comprising a vertical shaft bisecting said opening, a turntable substantially at ground level rotatable about said shaft, a turnstile consisting of equi-distantly spaced radially extending arms moving with said turntable and defining a plurality of compartments of which the turntable constitutes the floors thereof; power means including an electric motor for imparting rotation to said turnstile-turntable; a plurality of coin receiving units carried by said turnstile and accessible to passengers in said turnstile compartments, one unit for each compartment, each said unit having a movable coin detent for temporarily supporting an inserted coin; coin-operated switch means carried by said casing; electrically actuated mechanical stop means for arresting turnstile-turntable rotation; cyclically operating control means moving synchronously with said turnstile-turntable to operate said mechanical stop means unless periodically influenced by said coin-operated switch means, and a common detent operating device for moving said coin detents of said coin receiving units to dislodge for collection said supported coins as said turnstile-turntable rotates.

2. A turnstile installation comprising a barrier structure including a pair of side wings defining an opening; a

combined turnstile-turntable structure comprising a vertical shaft bisecting said opening, a hub rotatable about said shaft, a gear wheel secured on said hub for rotation about said shaft, a casing supported on said hub for rotation therewith, a fixed platform within said casing, a turntable substantially at ground level rotatable about said shaft, a turnstile consisting of equi-distantly spaced radially extending arms moving with said turntable and defining a plurality of compartments of which the turntable constitutes the floors thereof; power means mounted on said fixed platform and including an electric motor and transmission means co-operating with said gear wheel for imparting rotation to said turnstile-turntable; a plurality of coin receiving units carried by said turnstile and accessible to passengers in said turnstile compartments, one unit for each compartment; coin-operated switch means carried by said casing; electrically actuated mechanical stop means for arresting turnstile-turntable rotation, and cyclically operating control means moving synchronously with said turnstile-turntable to operate said mechanical stop means unless periodically influenced by said coin-operated switch means.

3. A turnstile installation comprising a barrier structure including a pair of side wings defining an opening; a combined turnstile-turntable structure comprising a vertical shaft bisecting said opening, a turntable substantially at ground level rotatable about said shaft, a turnstile consisting of equi-distantly spaced radially extending arms moving with said turntable and defining a plurality of compartments of which the turntable constitutes the floors thereof; power means including an electric motor for imparting rotation to said turnstile-turntable; a plurality of coin receiving units carried by said turnstile and accessible to passengers in said turnstile compartments, one unit for each compartment; coin-operated switch means carried by said casing; said coin-operated switch means comprising at least one selfholding relay conditioned for operation by insertion of a coin in a selected one of said coin receiving units; electrically actuated mechanical stop means for arresting turnstile-turntable rotation, and cyclically operating control means moving synchronously with said turnstile-turntable to operate said mechanical stop means unless periodically influenced by said coin-operated switch means, said control means including a notched disc rotating synchronously with the turnstile-turntable, a retractable detent for co-operating with said notched disc, solenoid means in circuit with the turnstile-turntable motor for periodically retracting said detent, cam means rotating synchronously with said notched disc, and a reset switch operable by said cam means to release said conditioned selfholding relay.

4. A turnstile installation comprising a barrier structure including a pair of side wings defining an opening; a combined turnstile-turntable structure comprising a vertical shaft bisecting said opening, a hub rotatable about said shaft, a gear wheel secured on said hub for rotation about said shaft, a casing supported on said hub for rotation therewith, a fixed platform within said casing, a turntable substantially at ground level rotatable about said shaft, a turnstile consisting of equi-distantly spaced radially extending arms moving with said turntable and defining a plurality of compartments of which the turntable constitutes the floors thereof; power means mounted on said fixed platform and including an electric motor and transmission means co-operating with said gear wheel for imparting rotation to said turnstile-turntable; a plurality of coin receiving units carried by said turnstile and accessible to passengers in said turnstile compartments, one unit for each compartment, each said unit having a movable coin detent for temporarily supporting an inserted coin; coin-operated switch means carried by said casing, said coin-operated switch means comprising at least one self-holding relay conditioned for operation by insertion of a coin in a selected one of said coin receiving units; electrically actuated mechanical stop means for



arresting turnstile-turntable rotation; cyclically operating control means moving synchronously with said turnstile-turntable to operate said mechanical stop means unless periodically influenced by said coin-operated switch means, said control means including a notched disc rotating synchronously with the turnstile-turntable, a retractable detent for co-operating with said notch disc, solenoid means in circuit with the turnstile-turntable motor for periodically retracting said detent, cam means rotating synchronously with said notched disc, and a reset switch operable by said cam means to release said conditioned self-holding relay, and including also a brake for rapid arresting of the

turnstile-turntable and switch means operable by said notched disc detent to apply said brake, and a common detent operating device for moving said coin detents of said coin receiving units to dislodge for collection said supported coins as said turnstile-turntable rotates.

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