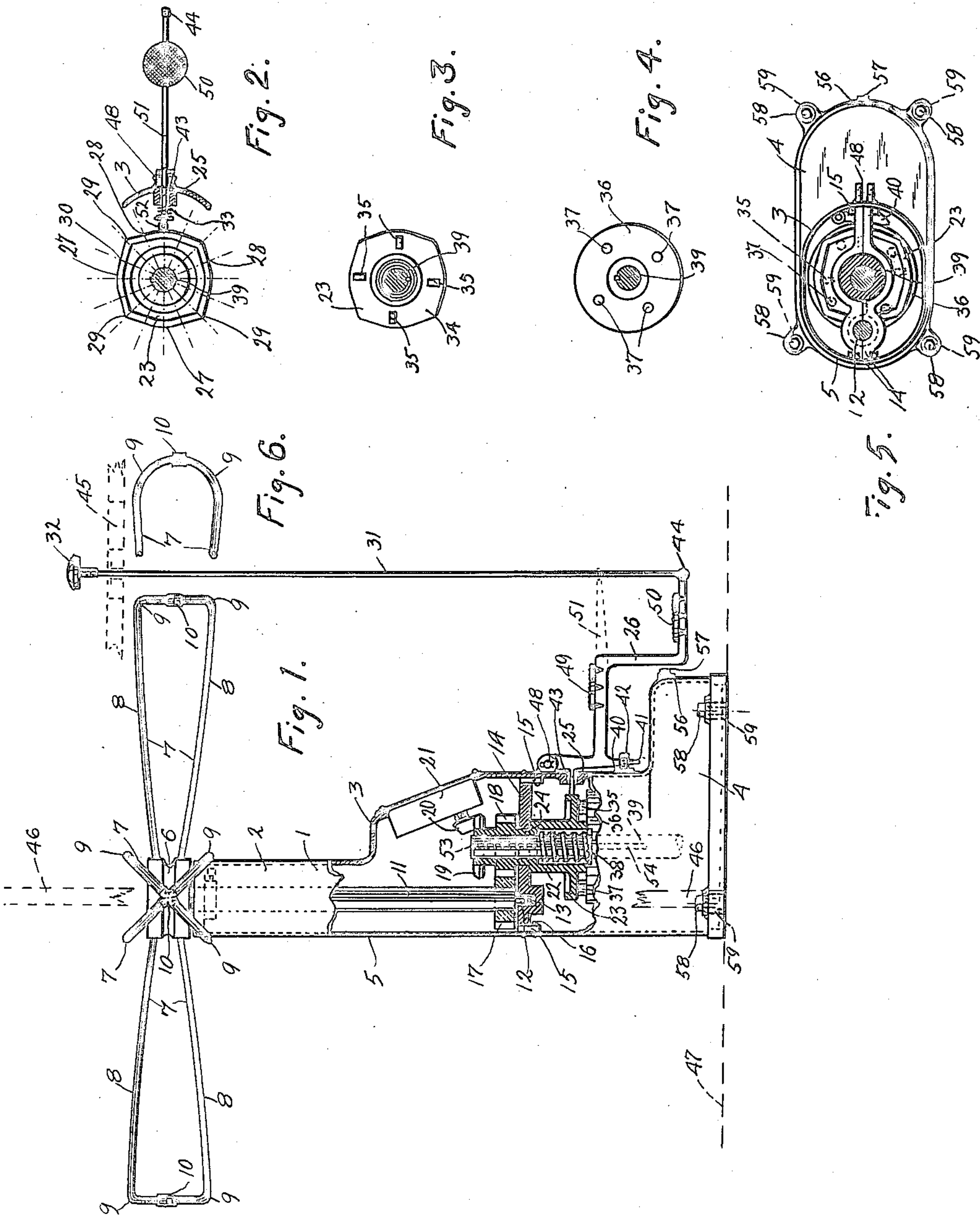


Jan. 2, 1923.

1,440,485

G. F. MYERS.  
TURNSTILE.  
ORIGINAL FILED MAY 10, 1919.



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## UNITED STATES PATENT OFFICE.

GEORGE FRANCIS MYERS, OF NEW YORK, N. Y.

## TURNSTILE.

Application filed May 10, 1919, Serial No. 296,216. Renewed December 17, 1921. Serial No. 523,245.

*To all whom it may concern:*

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

This invention relates to turnstiles, and has for its object to provide a machine of this character that can be relied upon under all conditions.

At present turnstiles are not popular with the public because of the many accidents which have occurred when passengers have run accidentally against the resisting arms of the turnstile before the operator had released the mechanism that allowed the arms to rotate. Damage suits based on the injuries sustained thereby have been instituted and won against the party operating the turnstile and this has therefore brought the turnstile into disfavor with the buyer,—both buyer and user being united against a device which is helpful to both.

The herein described device obviates this trouble by interposing a spring between the arms of the turnstile and the main working mechanism thereof so that, while it will be impossible for the passenger to force his way through the turnstile against the will of the operator, and therefore a guard or check is placed against willful neglect to pay the fare charged, yet any person who has paid this fare or who is entitled to pass through the turnstile but accidentally runs into the arms of the same suddenly will not receive any injury thereby because the master spring in the machine will yield to a certain extent and prevent the shock of collision of the passenger against the unyielding arms of the present turnstiles.

Also by the use of the cam wheel and its associated parts old style turnstiles commonly known as standard types can be made into automatically operated turnstiles by simply removing the key or set screw holding the present operating mechanism to the vertical main shaft and interposing a cam wheel and associated parts. But at any time and with the simple expedient of replacing the said key or set screw in its place as before the turnstile can be remodelled into the said standard type.

When existing turnstiles are housed in a booth or the like they are always placed so

that the center of the head holding the revolving arms is directly under the front panel or wall of the said housing in order to gain all of the advantage of the full length of the arm or arms. This however allows the forward part of the lower portion of the turnstile to project along the floor in front of the housing which projection is apt to trip up the passenger, and in any event blocks up the passageway through which the passenger must go, which passageway is none too wide under any circumstance. But by making the forward portion of the turnstile casing or frame in a vertically straight line from practically the floor line to the head thereof, the impeding of the said passageway is done away with, and the full width is given over for the convenience and comfort of the passenger.

It has been found in practice that the operator is inclined to step very heavily upon the foot rest or treadle when he wishes to stop a passenger from passing through if an automatic turnstile is used, and this is still more the case when a standard type is used which necessitates the operator using the treadle every time that a fare goes through. The foot lever therefore comes in for a great amount of strain and is often broken; but the providing of a cushioned stop so that the shock of the stamping of the operator with his foot upon the treadle will be taken up, will be of advantage as it will help to keep the treadle from being broken, and the wear and tear on the operator will be dispensed with.

Many operators when in the booth containing the turnstile prefer to stand, and therefore the operating treadle with its foot rest is placed very near the floor. But it has been found, especially with the advent of women operators, that many prefer to sit, and therefore can not reach the low-lying foot rest. For these the double tiered foot lever herein shown will be a great boon,—for whether standing or sitting they can easily reach the said lever.

In all turnstiles used at present where a hand lever and a foot lever is used, these are separate levers though interacting; but as will be noticed only one lever is used herein doing away with the complication and expense of interacting double levers.

To decrease the shock incidental to the horizontal spring in the bottom portion of



the turnstiles used at present when the same forces back the plunger, rubber collars or sleeves are used around the bolts or lag screws which hold the turnstile to the floor; thus doing away with the disadvantage of the present mode of making the floor plate and the base of the turnstile in two pieces.

The shape or contour of the projecting or revolving arm or arms of the turnstiles used at present are also open to objection from an engineering standpoint. The shape or contour shown herein obviates any structural weakness by crossing the rods of the arms at their outer extremities, so that the push on any one rod is transmitted directly through the upper rod to lower rod back to the head again, instead of through an unstable vertical member as at present; in other words the well known X bracing is employed which is admitted to be the best shape for strength and rigidity. Besides there is but one joint or connection holding the rods together instead of two as at present.

Referring now to the accompanying drawings:

Figure 1 represents a side elevation, partly broken away, showing one of the embodiments of the invention, part of the same being in section.

Fig. 2 is a top plan view of the cam feature shown in Fig. 1 with its associated parts.

Fig. 3 is a bottom plan view of the said cam feature showing more particularly the lugs or stops on the bottom side thereof.

Fig. 4 is a top plan view of the ratchet wheel ordinarily employed in present turnstiles, but with the addition of upright counter stops or lugs.

Fig. 5 is a top plan view of the split bridge and associated parts; and Fig. 6 is a fragmentary side elevation of a modification of the arm of the turnstile.

The invention is substantially and preferably constructed and operated as follows, and consists of or includes or comprises—that is besides other things it has—a frame or casing 1, the upper part of which is of small section. The section 3 immediately below 2 is enlarged, and a third or ground floor section 4 is of still larger dimension. But the sections 2, 3 and 4 are placed eccentric one to the other in such a manner that their front sides make practically one straight vertical line 5 reaching from substantially the floor to the head 6 of the turnstile.

Mounted above the said section 2 is the said head with its projecting arm or arms 7. These arms as will be seen are curved to an outward or convexed curvature 8, and after being bent at right angles at 9 the four rods are fastened in the connection 10.

Dependent from the head 6 is the shaft 11 having a step 12 rotatable in the cup bear-

ing 13 mounted on the bridge 14 which is suitably fastened by the lugs 15 and rivets or bolts 16 to the frame or casing. On the lower end of the shaft 11 is keyed the pinion 17 meshing in the pinion 18.

The pinion is shown integral with the bevel wheel 19 meshing with the small pinion 20 which drives the mechanism of the registering apparatus 21. Also the pinion 18 is one with the sleeve or bell shaped portion 22 having the cam wheel 23 at its lower portion. The bridge 14 is split in order to be easily assembled over the neck 24 of the said sleeve 22.

The cam wheel 23, more particularly shown in Fig. 2 is contoured in such a manner that when it is revolved by the arms 7 through the head 6, shaft 11 and the pinions 17 and 18, it will permit the reciprocation of the pin or arm 25 of the lever 26.

The pin or arm 25 in Fig. 2 is shown on a neutral position or point 27; and as the cam 23 revolves, say clockwise, 25 will not be reciprocated until the cam 23 has advanced so that the point 28 thereof is directly under 25 then the said pin will be pushed out until the high point 29 is reached, after which the cam will permit the pin or arm 25 to recede. In other words the cam 23 is so designed that between the points 28 and 29 the said pin is being pushed out, and between the points 29 and 30 the pin is retracted, either by the weight of the lever 26 and its associated parts as the rod 31 and the handle 32, or the pin may be retracted by a spring 33 as shown in Fig. 2.

On the lower face 34 of the cam 23 are stops 35 and projecting from the upper surface of the ratchet wheel 36 which is used in most turnstiles at present, are the lugs or stops 37. These two sets of stops are normally placed some distance apart somewhat as shown in plan in Fig. 5.

Inside the bell shaped portion or sleeve 22 is coiled the large or master spring 38 fastened to the jack shaft 39 or to the inside of 22, and at its lower portion to the ratchet wheel 36; the shaft 39 being keyed to the upper portion of the sleeve 22.

As shown, if the stops 35 are mounted a short distance away from the stops 37 a certain amount of leeway or lost motion can be given to the arms 7; and a person after paying his fare and trying to rush for his train for instance before the operator had released the mechanism permitting the arms to rotate would not find solid bars resisting his advance, but would instead find a yielding device, thus taking away one of the greatest objections to the turnstile.

When however the two stops come together; then the two wheels 23 and 36 become as one and the mechanism of the turnstile contained in the bottom portion 4 is operated by throwing out the dog or pawl 40 by the



lower portion 41 of the lever 26 engaging the extended portion 42 of the said pawl and drawing back the same from engagement with the teeth of the ratchet wheel.

5 The lever 26 is a bent lever and has the rod 31 attached to the end thereof as at 44 and extends upwardly to the board 45 inside the housing or booth of which 46 represents the front portion broken away, and the level  
10 of the floor by the dotted line 47. The lever 26 is hinged at 48 and the pin or rod 25 slides through the opening 43 cored in the intermediate portion 3 of the casing 1. A handle 32 is arranged at the upper end of  
15 the rod 31, and two steps or foot rests 49 and 50 are arranged on the lever 25, one of the said foot rests being placed higher up on the same than the other.

Instead however of a bent lever with two  
20 rests thereon, as shown in Fig. 1, a straight lever 51 with one rest 50 may be used as shown in Fig. 2; and also if it be desired a roller 52 may be attached to the end of the rod 25 the more easily to travel over the  
25 cam 23.

By means of the said push handle or foot rests the pawl or dog 40 may be prevented from unlatching the cam and the cam finger from functioning; and the passenger can  
30 not go through the turnstile.

The shaft 39 has two keyways 53 and 54, and one key is made to fit either keyway. So that if the said key is placed in the upper keyway the machine will function as  
35 an automatic turnstile, and the shaft 11 and the shaft 39 therefore act, and in fact are practically one shaft; but if the said key be placed in the lower keyway the sleeve 22 will not function at all and the turnstile  
40 will be operated as an ordinary or standard machine.

If the two stops 35 and 37 be brought together and the spring 38 be removed, the machine would function exactly like the  
45 present turnstiles with all of their inherent defects.

The floor bolts or lag screws 56 have resilient collars or sleeves 57 so that the rebound of the heavy spring usually employed  
50 in present turnstiles will be taken up and dissipated.

Instead of making the arms 7 as shown in Fig. 1, with square corners 9, they can be made more like those shown in Fig. 6, that  
55 is with rounded corners.

As this invention is in some of its aspects generic, I do not limit myself to the particular construction shown or described, but also contemplate the employment of such  
60 equivalents as fairly fall within the scope of the claims.

In this connection it may be said that the invention is not limited, for instance, to making the main working shaft of the turn-  
65 stile in two or more eccentrically placed sec-

tions as shown, but instead the said shaft may be made in sections longitudinally and the spring coiled about the same for the purpose specified; nor to making the pin or arm 25 integral with the lever 26; the gears  
70 or pinions 18 and 19 may be made separate from the sleeve 22 and the latter can be slipped through the bridge 14 without having the said bridge made in two parts as shown; instead of one lever combining the  
75 hand and foot features two separate levers may be employed; the cam wheel 23 and its associated parts can be attached to the main vertical shaft of the ordinary turnstile without hardly a change except tapping the ex-  
80 isting ratchet wheel 36 for the lugs 37, and then attaching the same; and the secondary shock absorbers 57 may be either of rubber or may be springs.

It will therefore be understood that vari-  
85 ous changes may be made in the form, proportion, size and detail of the several structures shown, as well as the number and position of certain elements used, without departing from the spirit of the invention. 90

I claim:

1. A turnstile comprising a rotatable arm, a ratchet wheel, a pawl, and means for automatically releasing the said pawl from the said wheel by the rotation of the said  
95 arm.

2. A turnstile comprising a rotatable arm, a ratchet wheel, a pawl, and means for automatically releasing the said pawl from the said wheel by a limited rotation of the said  
100 arm.

3. A turnstile comprising a rotatable arm, a ratchet wheel, a pawl, means for automatically releasing the said pawl from the said wheel, and means for preventing the  
105 said pawl from functioning.

4. A turnstile comprising a head, a plurality of arms projecting from the said head and rotatable therewith, a shaft, a ratchet  
110 wheel rotated by the said shaft, a pawl engaging the said wheel, and means for automatically releasing the said pawl from the said wheel.

5. A turnstile comprising a head, a plurality of arms projecting from the said head  
115 and rotatable therewith, a shaft, a ratchet wheel rotated by the said shaft, a pawl normally engaging the said wheel, means for automatically releasing the said pawl from the said wheel, and means for preventing  
120 the said pawl from functioning.

6. A turnstile comprising a head, a plurality of arms projecting from the said head and rotatable therewith, a shaft, a ratchet  
125 wheel rotated by the said shaft, a pawl engaging the said wheel, and means for automatically releasing the said pawl from the said wheel by a limited rotation of the said arms.

7. A turnstile comprising a head, a plu- 130



- ality of arms projecting horizontally from the said head and rotatable therewith, a shaft, a ratchet wheel rotated by the said shaft, a pawl engaging the said wheel, means for automatically releasing the said pawl from the said wheel by a limited rotation of the said head and arms, and manually operated means for preventing the said head and arms from rotating.
8. A turnstile comprising a rotatable arm, locking means for preventing the said arm from rotating, and automatically operated means for unlocking the said locking means by a limited movement of the said arm.
9. A turnstile comprising a rotatable arm, a member rotated by the said arm, a locking device and means mounted on the said member for unlocking the locking device which holds the said member from rotating.
10. A turnstile comprising a rotatable arm, a member rotated by the said arm, a locking device and means mounted on the said member for automatically unlocking the locking device which holds the said member from rotating.
11. A turnstile comprising a rotatable arm, a shaft rotated by the said arm, a wheel on the said shaft, a locking device for locking the said shaft from rotating, and an intermediate device between the said wheel and the said locking device to release the said locking device.
12. A turnstile comprising a rotatable arm, a shaft rotated by the said arm, a cam wheel on the said shaft, a cam finger, a locking device, and means for unlocking the said locking device by the said wheel through the intermediacy of the said cam finger.
13. A turnstile comprising a rotatable arm, a shaft rotated by the said arm, a cam wheel on the said shaft, a cam finger, and a locking device unlocked by the movement of a cam finger operated by the said cam wheel through the intermediacy of a lever.
14. A turnstile comprising a rotatable arm, a shaft rotated by the said arm, a cam wheel on the said shaft, a cam finger, a lever operated by the said finger, a ratchet wheel, a pawl normally in engagement with the said ratchet wheel, the said pawl being withdrawn by the rotation of the said arm.
15. A turnstile comprising a rotatable arm, a depending shaft rotatable by the said arm, a cam wheel fixedly mounted on the said shaft, a ratchet wheel loosely mounted on the said shaft, and a locking device normally in engagement with the said ratchet wheel operated by the said cam wheel.
16. A turnstile comprising a rotatable arm, a depending shaft therefor, a cam wheel resiliently mounted on the said shaft, and a locking device normally in engagement with a ratchet wheel operated by the said cam wheel.
17. A turnstile comprising a rotatable arm, a depending shaft rotatable by the said arm, a cam wheel, lugs projecting from the said cam wheel, a ratchet wheel, and lugs projecting from the said ratchet wheel and adapted to engage the said first mentioned lugs.
18. A turnstile comprising a rotatable arm, a vertical shaft, a second vertical shaft driven by the said first mentioned shaft, and mechanism mounted on said second shaft for automatically operating the locking device of the machine.
19. A turnstile comprising a rotatable arm, a locking device normally preventing the said arm from rotating, means for manually releasing the said locking device and permitting the said arm to rotate, the said means permitting the said locking device to function automatically.
20. A turnstile comprising a rotatable arm, a ratchet wheel, a pawl normally in engagement with the said ratchet wheel, means for manually releasing the said pawl from engagement with the said ratchet wheel, and means for automatically releasing the same, both of the said means permitting the said arm to rotate.
21. A turnstile comprising a rotatable head, an arm thereon, a dependent shaft, a cam wheel loosely mounted on the said shaft, means for fastening the said cam wheel on the said shaft, a ratchet wheel also loosely mounted on the said shaft, means for fastening the said ratchet wheel on the said shaft, and a locking device operative either by the said cam wheel or without the aid of the same.
22. A turnstile comprising a rotatable head, an arm thereon, a dependent shaft, a cam wheel loosely mounted on the said shaft, a ratchet wheel also mounted on the said shaft, and means interchangeable for fixedly fastening either the said cam wheel or the said ratchet wheel to the said shaft.
23. A turnstile comprising a rotatable head, an arm therefor, a dependent shaft rotated by the said head, mechanism for operating the turnstile, and resilient means interposed between the said shaft and the operating mechanism of the turnstile, for the purpose specified.
24. A turnstile comprising a rotatable head, an arm therefor, a vertical shaft, a ratchet wheel and a pawl in engagement therewith, means for unlocking the said pawl from the said ratchet wheel, and a spring interposed between the said head and the said wheel for the purpose specified.
25. A turnstile comprising a rotatable head, an arm therefor, a vertical shaft, a spring one end of which is fastened fixedly to the said shaft, and a releasable locking device for the said shaft, the said spring being mounted between the said head and the said device.



26. A turnstile comprising a rotatable head, an arm therefor, a dependent shaft, a ratchet wheel, a cam wheel, and a spring lying adjacent mounted between the said wheels.

27. A turnstile comprising a rotatable head, an arm therefor, a dependent shaft, a cam wheel fixedly mounted on the said shaft, a ratchet wheel loosely mounted on the said shaft, and a spring fastened to and between the said wheels.

28. A turnstile comprising a rotatable head, an arm therefor, a shaft, a cam wheel having a bell shaped hub fixedly mounted on the said shaft, a ratchet wheel loosely mounted on the said shaft, and a spring fastened to the inside of the said bell shaped hub and the said ratchet wheel.

29. A turnstile comprising a rotatable head, an arm therefor, a working shaft attached to the said head and rotatable with the same, a member concentric with the said shaft but not fastened thereto, and a spring coiled about the said shaft, one end of the said spring lying adjacent to the said rotatable part and the other end to the said member, for the purpose specified.

30. A turnstile comprising a rotatable head, an arm therefor, a main working shaft attached to the said head and rotatable with the same, a member concentric with the said shaft but not fastened thereto, a countershaft and a spring coiled about the said countershaft, one end of the said spring lying adjacent to the said rotatable part and the other end to the said member, for the purpose specified.

31. A turnstile comprising a rotatable head, an arm therefor, a frame or housing mounted below the said head and arm, and means mounted between the said frame and the floor on which the turnstile stands to take up the shock of the internal mechanism of the turnstile.

32. A turnstile comprising a rotatable head, an arm therefor, a frame or housing below the said head and arm, bolts or the like for holding the said frame to the floor on which the turnstile stands, and resilient sleeves between the said bolts or the like and the said frame.

33. A turnstile comprising a rotatable head, and an arm therefor the rods thereof crossing at their outer portions.

34. A turnstile comprising a rotatable head, and an arm therefor bending outwardly or convexedly both in its upper and in its lower portions.

35. A turnstile comprising a rotatable head, and an arm therefor including a plurality of rods curved upwardly or convexedly.

36. A turnstile comprising a rotatable head, and an arm therefor including a plurality of rods crossing at their outer por-

tions and held together with a central connection adjacent to their point of crossing.

37. A turnstile comprising a rotatable head, and an arm therefor including a plurality of rods curved upwardly or convexedly both above and below the said head.

38. A turnstile comprising a rotatable head, and an arm therefor including a plurality of rods curved upwardly or convexedly and crossing at the outer portions.

39. A turnstile comprising a rotatable head, and an arm therefor including a rod projecting outwardly from the upper end of the said head diagonally downwardly and back to the lower part of the said head.

40. A turnstile comprising a rotatable head, an arm therefor including a plurality of rods curved and projecting from the upper part of the said head outwardly and then diagonally downwardly and back to the lower part of the said head and curved downwardly, and a connection mounted adjacent to the point of crossing of the said arms at the outer extremities.

41. A turnstile comprising a rotatable head, a plurality of arms attached to the said head and including each a plurality of rods curved upwardly or convexedly and crossing at their outer extremities, a connection holding the said rods adjacent to their point of crossing, a shaft depending from the said head, a second shaft driven by the said first mentioned shaft, a cam wheel resiliently mounted on the said second mentioned shaft, a cam finger operable by the said cam wheel, a ratchet wheel loosely mounted on the said second mentioned shaft, a pawl in engagement with the said ratchet wheel, and a combined double stepped and manually operable lever for operating the said pawl manually the said lever permitting the said pawl to be operated automatically.

42. A turnstile comprising a base integral therewith, a rotatable head and a resilient member interposed between the said base and the said head for the purpose specified.

43. A turnstile comprising a shaft normally locked against rotation and having a series of radially disposed arms fast thereon, and means for mounting the said shaft and part of its locking mechanism to yield to a limited degree to the application of pressure to one or more of the said arms.

44. A turnstile comprising a shaft normally locked against rotation and having a series of radially disposed arms fast thereon, a stationary casing below the said arms and encompassing the said shaft, and means for mounting the said shaft to yield to a limited extent to the application of pressure to one or more of the said arms.

45. A turnstile comprising a rotatable head, an arm fixedly attached thereto, locking mechanism for the said head and arm,



and means for unlocking the said head and arm by a limited rotation of the said head and arm.

46. A turnstile comprising a rotatable head and arm, a shaft depending from the said head, a casing enclosing the said shaft, a locking device also enclosed by the said casing, and means also mounted within the said casing for automatically unlocking the said locking device.

47. A turnstile comprising a rotatable head and arm, a member rotated by the said head and arm, a casing enclosing the said member, a locking device, and means mounted on the said member for automatically unlocking the said head and arm by the said locking device.

48. A turnstile comprising a rotatable head, an arm therefor, and resilient means interposed between the said head and the operating means of the turnstile for driving the said last mentioned means.

49. A turnstile comprising a rotatable head, an arm therefor, a working shaft for driving the operating mechanism of the turnstile, and a resilient member interposed between the said head and the said mechanism for driving the same.

50. A turnstile comprising a rotatable head, an arm therefor, a working shaft for driving the operating mechanism of the turnstile, and a spring coiled about the said shaft for the purpose of driving the said mechanism.

51. A turnstile comprising a shaft normally locked against rotation and having a series of radially disposed arms fixed thereon, and means for mounting the said shaft to yield to a limited extent to the application of pressure to one or more of the said arms.

52. A turnstile comprising a shaft normally locked against rotation and having an arm fixed thereon, and means for mounting the said shaft to yield to a limited extent to the application of pressure to said arm.

53. A turnstile comprising a rotatable head, an arm therefor, and a casing of approximately the same cross section as the said head and mounted below the said head and arm having its front portion perpendicular to its floor portion and extending in a straight line substantially from the said floor portion to the said head.

54. A turnstile comprising a rotatable head, an arm therefor, and a casing below

the said head and arm consisting of three integral tiers or portions, one of small diameter or size, a second of larger diameter or size, and a third of still larger diameter or size, each of the said tiers being eccentric one to the other with one of their sides or faces in vertical alignment.

55. A turnstile comprising a rotatable head, an arm therefor, and a casing below the said head and arm of bottle shape but having the neck portion thereof eccentric to the contiguous lower portion.

56. A turnstile comprising a rotatable head, an arm therefor, a locking device, and a lever for operating the said locking device having two foot rests thereon spaced apart.

57. A turnstile comprising a rotatable head, an arm therefor, a locking device, and a lever for operating the said locking device having two foot rests spaced apart at different levels.

58. A turnstile comprising a rotatable head and arm, and a casing mounted below the said head and arm and having a horizontal cross section adjacent to the said head of approximately the cross section of the said head, a cross section midway to the floor of greater cross section, and a base of still greater cross section, and having its front portion perpendicular to the floor and extending in a straight line from the floor to the top of said casing.

59. A turnstile comprising a rotatable head and arm, and a casing mounted below the said head and arm and having a horizontal cross section adjacent to the said head of approximately the cross section of the said head, a cross section midway to the floor of greater cross section, and a base of still greater cross section, all of the said cross sections of the said casing having approximately the same contour, and having its front portion perpendicular to the floor and extending in a straight line from the floor to the top of the said casing.

60. A turnstile comprising a rotatable arm, a shaft rotated by the said arm, depending lugs rotated by the said shaft, and a second set of depending lugs rotated by the said shaft and projecting upwardly and adapted to engage the said first mentioned lugs, there being intervening spaces between the working faces of the said upper and the said lower sets of lugs.

GEORGE FRANCIS MYERS.