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TURNSTILE

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2 Sheets-Sheet 1

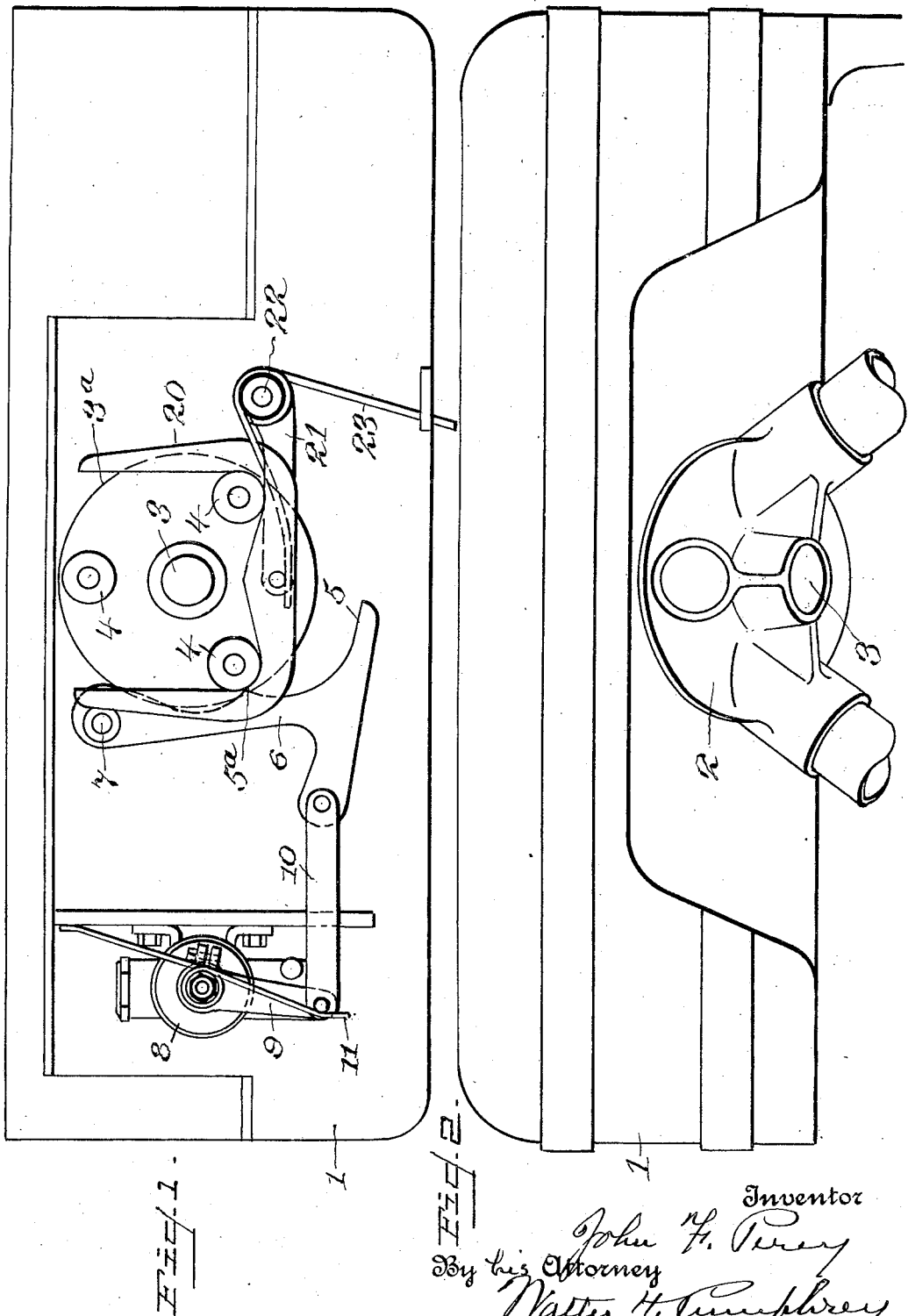


Fig. 1.

Fig. 2.

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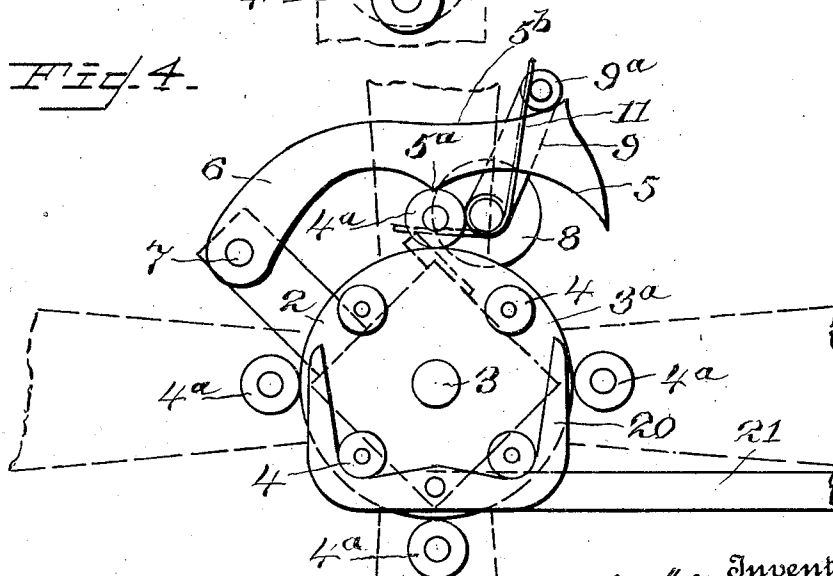
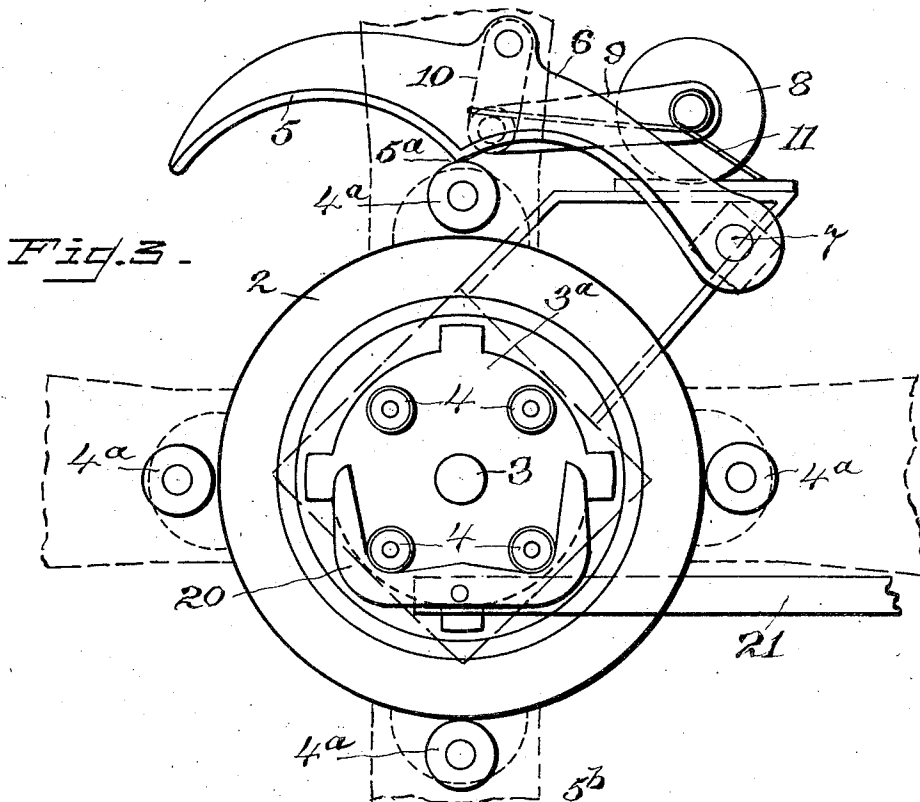
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UNITED STATES PATENT OFFICE

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TURNSTILE

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Application April 12, 1934, Serial No. 720,212

12 Claims. (Cl. 39—3)

This invention relates generally to turnstiles, gates and like passage-controlling barriers and while not limited in its application, is specially designed and adapted, as herein embodied, for use with turnstiles of the two-way type, which are rotatable in one direction to give entrance through a controlled passage and in the opposite direction for exit purposes.

The invention has for its object to eliminate all objectionable noise and produce a turnstile that is silent in operation. To this end provision is made for bringing the turnstile to a quick, easy stop at the end of each entrance or exit operation, without increasing the operation time period or causing the rotating barrier thereof to vibrate or oscillate as it reaches its home positions.

To increase the operation time period by slowing down the speed of the turnstile before it has practically completed its operation, is seriously objectionable, as it would result in reducing the capacity of the machine, which must be maintained at the maximum in order to meet traffic conditions at busy locations.

The prevention of vibration or oscillation of the rotating barrier, on arriving at its home positions, is also required for the same reason and to avoid confusing and injuring persons rushing through the controlled passage.

To meet the above stated requirements, I employ a brake, preferably of the hydraulic type, which is arranged to be automatically operated at or near the end of each entrance or exit operation of the turnstile, when the rotating barrier thereof is moving at its highest speed. The action of the brake is such as to effect, practically, an instantaneous speed check, which, however, is cushioned to prevent either noise or damaging shock or jar to the turnstile mechanism.

Supplementing the action of the brake but acting independently of it, both for entrance and exit operations of the turnstile, there is a device in the nature of a vibration or oscillation check for the barrier, which operates to steady it as it comes into its home positions and yieldingly maintains it against movement in either direction.

Several mechanisms, suitable for carrying my invention into effect, are illustrated in the accompanying drawings. These mechanisms, while differing somewhat in structural detail, all operate on the same general principle and will serve as practical examples of the application of the invention to a present day turnstile.

In the drawings—

Fig. 1 is a top plan view of a turnstile, showing my invention applied. As the turnstile shown is a well known three-arm type, in extensive use, a complete showing is not necessary and it has accordingly been limited to such parts or members as have direct cooperative relation to the

invention. In this type of turnstile, the deck or base plate on which the operating mechanism is mounted is tilted at more or less of an angle to the horizontal but, for clearness of illustration, it is here shown in a horizontal plane in Fig. 1.

Fig. 2 is a view in elevation of the side of the turnstile which faces the passage it is intended to control.

Fig. 3 is a top plan of a four-arm type of turnstile, showing the application of a modification of the invention, and

Fig. 4 is a like view of a further modification.

Referring now to the drawings, 1, represents the head casing of the turnstile with the cover plate removed. The head casing is supported in the usual manner on a suitable standard, pedestal or the like (not shown).

The armed barrier of the turnstile is indicated at 2, and is mounted fast upon a short shaft or spindle 3. In Figs. 1 and 2, the barrier spindle is inclined downward at an angle of about 45 degrees and the three equi-spaced barrier arms stand at such an angle to the spindle as to cause them to successively extend in a horizontal plane when in barrier position or across the passage the turnstile is intended to control.

A disk 3^a, fast on the barrier spindle 3, has three equi-spaced rollers 4, 4, etc., mounted upon it which are relatively positioned to successively cooperate with the brake applying and releasing cam, as the armed barrier is rotated.

The cam referred to, indicated at 5, is formed in part with a lever 6, pivoted at 7, and is so shaped that when engaged by one of the rollers 4, it will cause the lever to move in a direction to apply the brake and check and regulate its movement in the opposite direction, under the action of a spring, to, in effect, reset the brake preparatory to the next operation.

Normally, or when the barrier is in a home position, that is, with one of its arms across or barring the turnstile-controlled passage, one of the rollers 4 is at rest at the high point 5^a of the cam 5, as shown in Fig. 1. In other words, the roller has traversed half of the cam to apply the brake and bring the turnstile to a stop to complete its operation and has come to rest at the mid-point of the cam. In the first part of the next operation of the turnstile, the roller traverses the second half of the cam, which permits the brake to be restored to normal before again being applied to check the barrier, as will be hereinafter more fully explained.

The brake 8, as above stated is of the hydraulic type and as no claim is made for novelty in its structural details, it will not be necessary to illustrate or describe the same. It suffices to say, it is a well known form provided with an actuating arm or lever 9, the outer end of which is connected to the cam-faced lever 6, by a link 10, through

which motion is transmitted from the cam to the brake. A retractile spring 11, is employed to restore the brake to normal after each operation and, acting on the linked end of the brake-actuating arm 9, the spring also serves to yieldingly maintain the cam-faced lever 6, in cooperative relation with the rollers 4.

To offset the tendency of the armed barrier to vibrate or oscillate when brought to a stop by the brake, I employ a positioning shoe 20, which is so shaped as to engage the rollers 4, in pairs, as shown in Fig. 1. The shoe is approximately U-shaped and is pivotally mounted on the end of a lever 21, pivoted at 22, and yieldingly maintained in cooperative relation with the rollers by means of a spring 23.

This shoe, acting through the rollers, exerts considerable braking power on the barrier as the rollers approach the home position shown in Fig. 1, and, in addition, by causing one engaged roller to act against and oppose the movement of the other engaged roller, in whichever direction the machine operates, the shoe effectively checks any tendency of the barrier to vibrate or oscillate at the end of its operation.

In the modification shown in Fig. 3, the rollers 4, are limited to cooperation with the positioning shoe in the manner above described and an additional set of four rollers, indicated at 4^a, 4^a, etc., is provided for cooperation with the cam-faced lever. These rollers 4^a, are mounted on the underside of the barrier arms on lugs extending from the hub of the barrier, otherwise the construction and operation follow the above description given with reference to Figs. 1 and 2.

In the further modification shown in Fig. 4, the additional set of rollers 4^a, is employed as in Fig. 3 to cooperate with the cam-faced lever but here we dispense with the link 10, of Figs. 1, 2 and 3, which connects the cam-faced lever with the actuating arm of the brake and provide an additional cam face 5^b, which cooperates with a stud or roller 9^a, carried by the free end of the brake-actuating arm 9.

As the operation and various important advantages of the invention will be apparent from the foregoing, it will not be necessary to further describe the same.

Having described my invention, I claim:

1. A turnstile combining a rotatable armed barrier, an hydraulic brake, a plurality of members rotatable with the barrier and adapted to cooperate successively with the brake to apply the same near the end of each operation of the barrier, and a cam interposed between said members and the brake to control and regulate the transmission of motion between the same.

2. A turnstile combining a rotatable armed barrier, an hydraulic brake, a plurality of members rotatable with the barrier and adapted to cooperate successively with the brake to apply the same near the end of each operation of the barrier, and a spring-retracted cam interposed between said members and the brake to control and regulate the transmission of motion between the same.

3. A turnstile combining a rotatable armed barrier, an hydraulic brake, a plurality of members rotatable with the barrier and adapted to cooperate successively with the brake to apply the same near the end of each operation of the barrier, and a pivoted cam-faced lever interposed between said members and the brake to control and

regulate the transmission of motion between the same.

4. A turnstile combining a rotatable armed barrier, an hydraulic brake, a plurality of members rotatable with the barrier and adapted to cooperate successively with the brake to apply the same near the end of each operation of the barrier, and a spring-retracted cam-faced lever pivotally interposed between said members and the brake to control and regulate the transmission of motion between the same.

5. A two-way turnstile combining an armed barrier rotatable in either direction, an hydraulic brake, a plurality of members rotatable with the barrier and adapted to cooperate successively with the brake to apply the same near the end of each entrance and exit operation of the barrier, and a cam interposed between the said members and the brake to regulate the transmission of motion between the same.

6. A two-way turnstile combining an armed barrier rotatable in either direction, an hydraulic brake, a plurality of members rotatable with the barrier and adapted to cooperate successively with the brake to apply the same near the end of each entrance and exit operation of the barrier, and a spring-retracted cam pivotally interposed between the said members and the brake to regulate the transmission of motion between the same.

7. A two-way turnstile combining an armed barrier rotatable in either direction, an hydraulic brake, a cam link-connected to the brake for actuating the same, and a plurality of members rotatable with the barrier and adapted to cooperate successively with the cam to apply the brake near the end of each entrance and exit operation of the barrier.

8. A two-way turnstile combining an armed barrier rotatable in either direction, an hydraulic brake, a spring-retracted cam-faced lever pivotally mounted and link-connected to the brake for actuating the same, and a plurality of members rotatable with the barrier, and adapted to cooperate successively with the cam to apply the brake near the end of each entrance and exit operation of the barrier.

9. A turnstile combining a rotatable armed barrier, a plurality of equi-spaced members rotatable with the barrier, and a barrier-positioning device comprising a spring-held lever provided with an independently movable member adapted to engage the barrier members in pairs.

10. A turnstile combining a rotatable armed barrier, a plurality of equi-spaced members rotatable with the barrier, and a barrier-positioning device comprising a spring-held lever provided with a pivoted terminal shoe adapted to engage the barrier members in pairs and cause one of said engaged members to oppose movement of the other engaged member.

11. A turnstile combining a rotatable armed barrier, a plurality of equi-spaced rollers carried by the barrier, and a barrier-positioning device comprising a spring-held lever provided with an approximately U-shaped terminal shoe adapted to engage the barrier rollers in pairs.

12. A turnstile combining a rotatable armed barrier, a plurality of equi-spaced members rotatable with the barrier, and a barrier-positioning device comprising a spring-advanced shoe approximately U-shaped and adapted to engage the barrier members in pairs.

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