April 28, 1953 W. J. SUMMERS 2,636,680

COUNTING DEVICE

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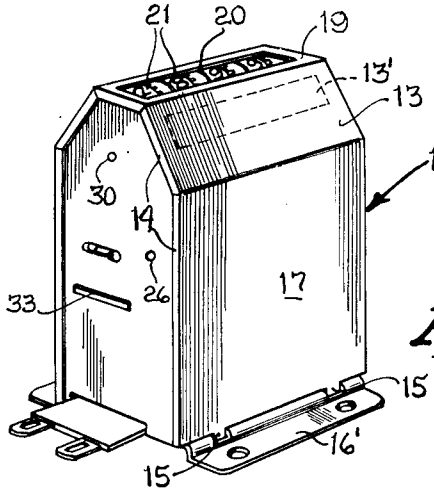

Fig. 1.

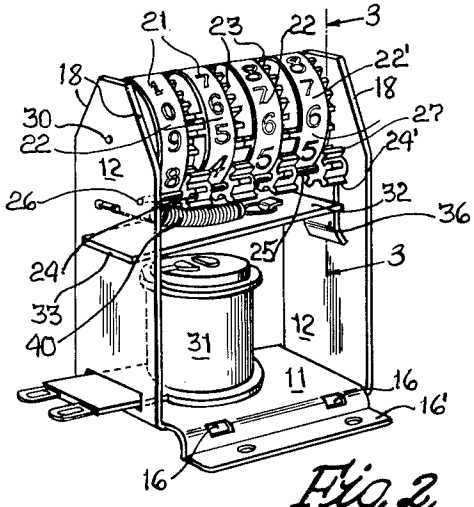

Fig. 2.

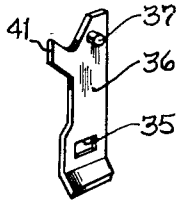

Fig. 5.

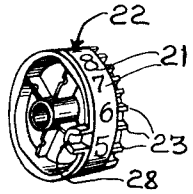

Fig. 6.

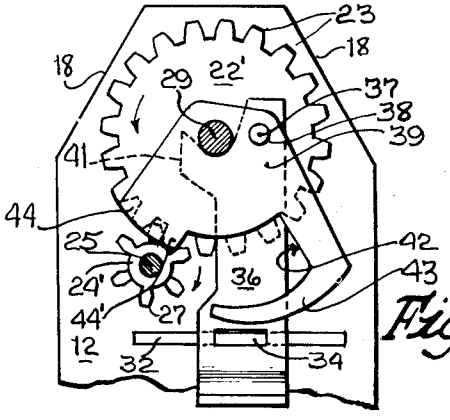

Fig. 3.

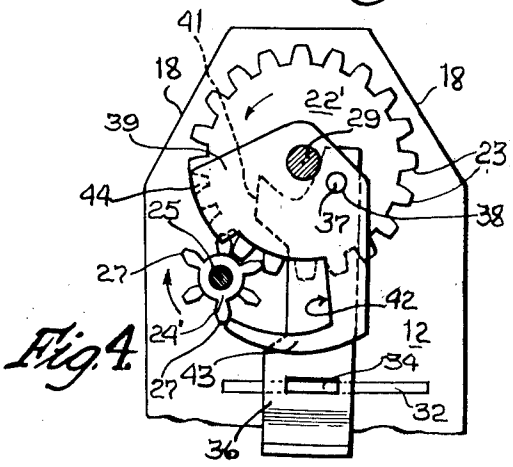

Fig. 4.

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UNITED STATES PATENT OFFICE

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COUNTING DEVICE

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3 Claims. (Cl. 235—92)

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This invention relates to certain new and useful improvements in counting devices and has for its object the provision of an improved construction of this character which will be highly efficient in use and economical in manufacture.

Among the salient objects of this invention is the provision of an arrangement for preventing the operation of the counting wheels by vibration, shock, or any method other than that of the means provided for such operation.

Devices of the character hereinafter described are especially useful in recording the number of coins deposited in a vending machine or a coin-operated amusement device.

It has been found that by violently shaking or striking the machine the counting wheels can be caused to rotate. The invention has for its object the provision of a simple arrangement for preventing the operation of the counting device in the above manner.

Yet another and equally important object of the invention is the provision of a device of this character which comprises the minimum number of parts, thereby resulting in economical assembly and manufacture.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

Fig. 1 is a perspective view of the invention;

Fig. 2 is a perspective view of the same showing the cover thereof removed;

Fig. 3 is a fragmentary sectional detail view taken substantially on line 3—3 of Fig. 2;

Fig. 4 is a fragmentary sectional detail view similar to Fig. 3 but showing the parts thereof in different positions with respect to each other;

Fig. 5 is a perspective view of a pull link embodied in the invention; and

Fig. 6 is a perspective view of one of the counting wheels embodied in the invention.

In the drawings my improved counting device is shown as comprising an enclosure 10. This enclosure includes a bottom wall 11 and side walls 12 formed integral therewith, and a cover 13, the bottom wall 11 constituting a mounting plate. The cover is formed substantially U-shaped and has flanges 14 which overlap adjacent end portions of the side walls. The cover 13 provides attaching lugs 15 which, after projection through slots 16 formed in the bottom wall 11, are bent upon the bottom wall to complete connection between the cover and such wall. The upper portions of the walls 17 of the cover taper inwardly to conform to the tapered upper portions 18 of the side walls 12. These tapered portions of the cover are formed integral with a flat intermediate portion 19. This portion 19 is provided with an elongated slot 20 preferably, though not necessarily, closed by a transparent closure of plastic or like material. Through this slot 20 are viewed the indicia or numbers 21 of the counting wheels 22, the numbers running from zero to nine. Each wheel 22, along one peripheral edge thereof, is provided with circumferential teeth 23 which mesh with the teeth of an adjacent gear 24 rotatably mounted on a shaft 25 having its ends journaled in the side walls as at 26.

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Alternate teeth of the gear 24 are shorter than the adjacent tooth of said gear and the longer teeth 27 of such gear are adapted to be engaged by a driving lug 28 formed on each of the wheels 22 whereby to successively advance the wheels 22 one step.

Such an arrangement is well known in the art and constitutes no part of the present invention. These wheels 22 are mounted for individual rotation upon a shaft 29 having its ends 30 journaled in the side walls.

Mounted on the plate 11 is an electromagnetic coil 31. Associated with this coil 31 is an armature plate 32 having one end 33 journaled in one of the side walls 12. The opposite end portion of the armature plate 32 provides a lug 34 which projects into a slot 35 of a pull link 36. This pull link 36 has a lateral pin 37 which projects into an opening 38 formed in a rocker arm 39.

The armature plate 32 is normally urged to project upwardly from the coil 31 by means of a spring 40. This upward movement of such armature plate 32 is limited by a stop finger 41 formed as a part of the pull link 36.

The rocker 39 is mounted for pivotal movement upon the shaft 29 as shown in Figs. 3 and 4. It provides a cut-out portion 42 forming a finger 43 which is adapted to engage an adjacent long tooth of the adjacent gear 24' of the gears 24 to impart rotation to such gear in the direction indicated by the arrow in Fig. 4. This operation takes effect when the armature plate is attracted to the coil 31.

Upon return of the armature plate to its initial starting position by action of the spring 40, a shoulder or nose 44 provided by the rocker arm 39 will engage an adjacent long tooth of the gear 24' and complete the cycle of rotation of such gear so as to advance the adjacent wheel 22' of

the wheels 22 one step. When in the position shown in Fig. 3, the corner 44' of the rocker arm 39 will be disposed in position to engage an adjacent long tooth of the gear 24' whereby to latch the gear 24' against rotation by reason of vibration, shock, or the like.

From the foregoing description it is apparent that the counting device embodying my invention is provided with an effective arrangement for advancing the counting wheels and for latching said counting wheels against rotation other than by the electromagnetic coil. The device comprises relatively few parts, enabling economical assembly.

It will be particularly noted that the wheels 22 are of like construction and as such greatly facilitate the assembly of the device.

If desired, the opening 20 may be formed in either of the tapered wall portions 13 as shown in dotted lines 13'.

The bottom wall or mounting plate 11 provides mounting flanges 16' by which the device may be mounted in a desirable position upon a stationary support.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A mechanism for rotating a driving gear of a counting device in which gear the alternate teeth thereof are of longer length than the remaining teeth, comprising a number wheel bearing shaft, a rocker member pivotally mounted on one end of said shaft and comprising a nose portion and a driving finger adjacent the nose portion, said nose portion and said finger being arranged at one side of said driving gear and adapted to alternately engage adjacent ends of said long teeth of said driving gear, said finger adapted to advance said driving gear in one direction and said nose portion adapted to prevent rotation of said gear in an opposite direction, a pull link having pivotal connection with said rocker member and adapted to pivot said nose portion and said finger into alternate engagement with said long teeth of said driving gear, and an electromagnetic coil including an armature having pivotal connection with said link, and means for moving said armature upwardly to dispose said nose portion for engagement with said adjacent long teeth.

2. A mechanism for rotating a driving gear of a counting device in which gear alternate teeth thereof are of longer length than the remaining teeth, comprising a number wheel bearing shaft, a rocker member pivotally mounted on said shaft and comprising a nose portion and a driving finger adjacent the nose portion, said nose portion and finger being arranged at one side of said driving gear and adapted to alternately engage adjacent ends of long teeth of said driving gear, said finger adapted to advance said gear in an opposite direction, a pull link having pivotal connection with said rocker member and adapted to pivot said rocker and move said finger and said nose portion into alternate engagement with said long teeth of said gear, an electromagnetic coil including an armature having pivotal connection with said pull link and adapted to pivot said pull link in a downward direction, and spring means for moving said armature upwardly to dispose said nose portion for engagement with said adjacent long teeth, and a stop lug on said pull link adapted to engage said shaft to limit upward movement of said link and said armature by said spring means.

3. A counting device comprising an enclosure, number bearing wheels rotatably arranged in the enclosure, interdriving connections between said wheels comprising driving gears having a plurality of teeth with every other tooth wider than the adjacent tooth thereof, an electromagnetic coil arranged in the enclosure and including an armature plate, a rocker arm pivotally arranged in the enclosure and including a nose portion and an oppositely exposed driving finger, said nose portion and said finger being arranged at one side of said driving gears and adapted to alternately engage adjacent ends of the long teeth of one of said driving gears, said finger adapted to advance said gears in one direction and said nose portion adapted to prevent rotation of said gears after said advancement in an opposite direction, and a pull link having pivotal connection with said rocker member and with an end portion of said armature for alternately engaging the finger and the nose portion with said adjacent long teeth of one of said gears to impart rotation to said driving gears in one direction and to latch one of said gears from rotation in an opposite direction.

WILLIAM J. SUMMERS.

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