July 30, 1940. J. METTLER 2,209,703

COIN CONTROLLED VENDING MECHANISM

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Fig. 1.

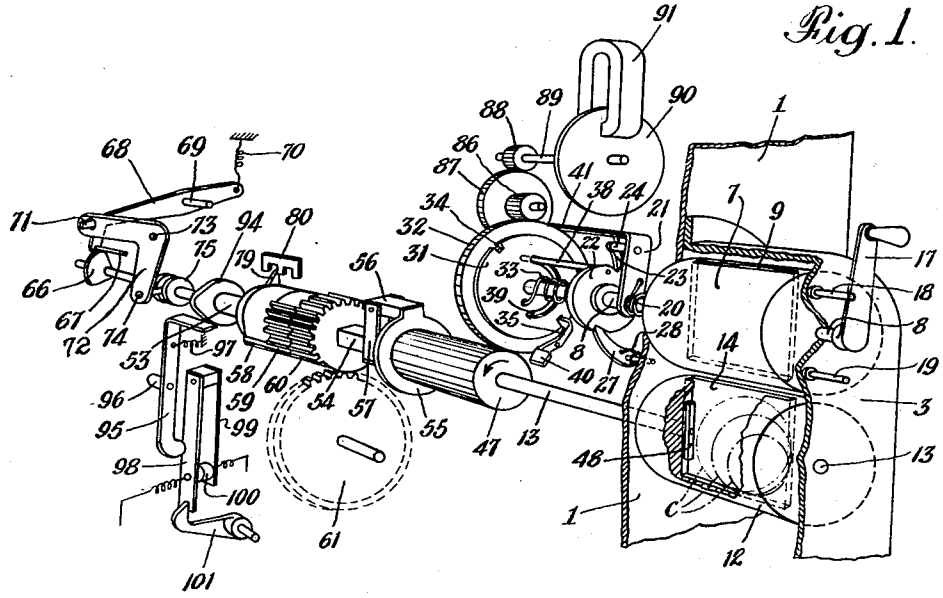
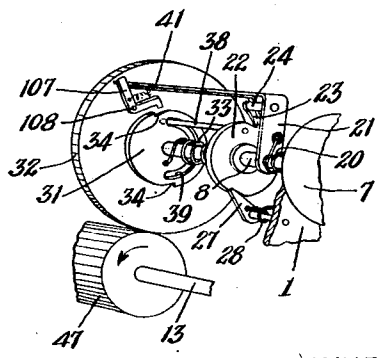


Fig. 2.



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COIN CONTROLLED VENDING MECHANISM

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5 Claims. (Cl. 194—3)

The invention relates to new and useful improvements in coin controlled vending mechanisms and more particularly to such improvements in the mechanism for setting the quantity measuring means proportionately to the value of a deposited coin.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, construction, arrangements, combinations and improvements herein shown and described.

The accompanying drawing, referred to herein and constituting a part hereof, illustrates one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawing:

Figure 1 is a perspective view of a mechanism embodying the invention; and

Figure 2 is a fragmentary perspective view of a modified form of the setting and releasing means.

Objects of the invention are to provide protection for settable energy or quantity measuring and vending mechanism from strain and injury through manual operation of coin controlled or other manually operated setting means; to further provide a power and actuating mechanism for setting the energy or quantity measuring mechanism, the power actuating mechanism being energized by the actuation of the coin controlled or coin receiving mechanism, and is then released and automatically controlled to set the energy measuring mechanism; to provide such a mechanism adapted to receive coins of different values and which will set the quantity measuring mechanism proportionately to the value of a deposited coin; to provide means whereby the action of the power actuating means on the energy measuring mechanism is regulated and controlled so as to avoid abrupt or detrimental operation; to provide in such a mechanism for automatically dispensing or measuring various quantities of energy corresponding to coins of different values which the mechanism is adapted to receive; to provide against actuation of the mechanism otherwise than by the coins which the mechanism is designed to receive.

In the present exemplary embodiment, a coin receiving device is provided which by a movement forwarding a deposited coin into the mechanism, winds the actuating spring of a power device and then automatically calls the power device into action to set the energy or quantity measuring mechanism, an interponent mechanism cooperating with the deposited coin to proportion the setting of the energy measuring mechanism by the power actuated mechanism to the value of the deposited coin, while a speed regulating device automatically controls the movement of said power actuated mechanism to avoid abrupt or other detrimental action. Other features of the invention will be set forth in connection with the subsequent full description of the mechanism, and it will be understood that the foregoing general description and the appended detailed description are both explanatory and exemplary of the invention but are not restrictive thereof.

Referring now in detail to the embodiment of the invention illustrated by way of example in the accompanying drawing, the energy or quantity measuring mechanism and the setting means therefor are inclosed within a closed casing 1, which is broken away to show the mechanism within. In the embodied form of the means for receiving deposited coins and for manually energizing and releasing the power actuating means for setting the energy or quantity measuring means, a closed casing 3 is provided attached to the casing 1. Within the casing 3 is a cylinder 7, fixed on a shaft 8, journalled in the casings 1 and 3, the cylinder having a coin-receiving pocket 9. A coin is deposited in the pocket 9 through a slot in casing 3. Directly beneath the cylinder 7 is a cylinder 12, fixed to rotate with a shaft 13, which is journalled in the casings 1 and 3. In the cylinder 12 is a coin-receiving pocket 14. On a half rotation of the cylinder 7, a coin deposited in the pocket 9 will drop into the pocket 14 of the cylinder 12, and after a half rotation of the cylinder 12 the coin will drop from the pocket 14 into the coin receptacle. While the coin is in the pocket 14, mechanism cooperates therewith to control the setting of the energy or quantity measuring mechanism proportionally to the value of the deposited coin, and also to prevent actuation of the mechanism otherwise than by coins of the proper value.

Referring now to the embodied means for energizing the power actuating means, a crank 17 is fixed on the end of shaft 8, exteriorly to casing 3, and two limiting stop pins 18 and 19 project from the casing and limit the movement of crank 17 to a half rotation. Fixed to the shaft 8 within the casing 1 is a bent flat arm 21, and mounted loosely on shaft 8 adjacent to the arm 21 is a disc 22, having two diametrically opposite detent teeth in its periphery. A spring-pressed actuating pawl 23 is pivotally mounted on a pin 24 fixed to and projecting from the arm 21, and engages with one of the teeth in the disc 22. A spring-pressed holding pawl 27 is mounted on a pin 28 fixed to and projecting inwardly from the casing 1, and engages with the other tooth in the disc 22. The pawls 23 and 27, while both en-

gaging the disc 22, are out of alinement so as not to interfere one with the other when pawl 23 imparts a half rotation to disc 22. A coil spring 20 loosely encircling shaft 8, with one end fast to casing 1 and the other end fast to arm 21, returns cylinder 7 after a half rotation has been imparted to it by crank 17, and tends to hold crank 17 against pin 18, with the coin slot and pocket in vertical alinement.

Also mounted loosely on shaft 8 is a disc 31, fixed to which is a gear wheel 32. A helical spring 33 loosely encircles the shaft 8, and is fast at one end to the disc 22 and at the other end to the disc 31. The disc 31 has two diametrically opposed notches 34 formed in its periphery, and a spring-pressed holding pawl 35 is normally in engagement with one of the notches 34 so as to hold the gear wheel 32 against movement. A pin 38 is fixed to and extends from the disc 22 and projects through a semi-circular slot 39 formed in the disc 31. The spring-pressed pawl 35 is provided at its tail end with a tripping plate 40, and the arm 21 has a flat right-angled extension 41 adapted to engage with the tripping plate 40 of the pawl 35 to release the disc 31 and gear wheel 32 for a semi-rotation after spring 33 has been put under tension by turning crank 7 a half revolution.

In the present embodiment, the connections between the power actuated setting means just described and the energy or quantity measuring means are combined with the mechanism which cooperates with the coin-receiving means, previously described, to set the energy or quantity measuring mechanism proportionally to the value of a deposited coin, and to guard against improper use of the mechanism. As embodied, a broad-faced pinion 47 is fixed on shaft 13, and meshes with gear wheel 32. The pinion makes a complete rotation for each half rotation of the power actuating means just described, and cylinder 12 makes a complete rotation for each half rotation of cylinder 7. The shaft 13 is longitudinally reciprocable, by means later to be described, for the purpose of gauging the deposited coins and to vary the setting of the energy measuring means accordingly. As embodied, the outer end of shaft 13 projects into the coin pocket 14 of the cylinder 12, a head 48 being fixed to the shaft and located within the pocket 14. Thus, cylinder 12 rotates with the power actuating device and the pinion 47, while at the same time the gauging head 48 is movable longitudinally within the coin pocket 14 as the shaft 13 reciprocates, the extent of the longitudinal movement of the shaft being determined by the size of the coin *c* in the pocket 14 (see broken lines in Figure 1). In axial alinement with shaft 13 is a shaft 53 having a squared end 54, closely abutting the flat face of pinion 47. A spring coupling connects pinion 47 and this squared end 54 of the shaft 53, said coupling comprising a plate 55, fixed to pinion 47 with a lug 56 projecting therefrom and flat springs 57 fixed to the lug and embracing the squared shaft end 54 at either side. Fixed on shaft 53 are a plurality of mutilated gears shown as three in number 58, 59 and 60, and these mutilated gears are adapted to pass selectively into mesh with a gear wheel 61, which belongs to the energy or quantity measuring mechanism, the extent of the rotation of said gear wheel 61 determining the amount of energy rendered available by the deposit of a coin.

In the embodied form of means for reciprocating the shaft 13 so as to gauge a deposited coin and to move the energy measuring gear 61 proportionally, a cam 66 is fixed on shaft 53 and a pin 67 cooperates with the cam. This pin is fixed on one branch of the forked end of a lever 68, pivoted at 69, and acted on by a spring 70. The other branch 71 of forked lever 68 projects through an opening in one end of bell-crank lever 72, which is pivoted at 73. At its other end, lever 72 carries a pin 74 which projects into an annular groove cam 75 fixed on shaft 53. When gear wheel 32 rotates pinion 47, shaft 53 is rotated, and the rotation of cam 66 permits spring 70 to draw lever 68 upwardly, thereby rocking bell-crank lever 72, and moving shaft 53 and shaft 13 to the right in Fig. 1. The extent of this longitudinal movement of shaft 13 is determined by the size of the coin *c* in the pocket 14, as shown in broken lines in Figure 1. This longitudinal movement of shaft 13 brings the corresponding one of the three gears 58, 59 or 60 into mesh with the energy measuring gear 61, and the amount of rotation to be imparted to gear 61 for each semi-rotation of the gear 32 is thereby determined.

Means are provided for preventing actuation of the mechanism by other than the predetermined coins, and as embodied an arm or tooth 79 is fixed on shaft 53 to rotate therewith, and cooperating therewith is a stationary notched plate 80. The tooth 79 and plate 80 are proportioned and positioned so that when a coin of the proper size is in the pocket 14, the tooth 53 will be in alinement with one of the notches in the plate 80, and one of the pinions 58, 59 or 60 will be in mesh with the gear wheel 61, and as shaft 53 rotates tooth 79 will pass through the alined notch in plate 80. If a coin of any other size be deposited in the pocket 9 and therefrom dropped into the pocket 14, the power actuated means will be operated, and pinion 47 and shaft 13 will be rotated, but tooth 79 will be out of alinement with any of the notches in the plate 80, and will strike the plate and will hold the shaft 53 from rotation, and there will be no rotation or setting of the energy measuring gear 61. However, spring clutch 57 will yield, and thus permit one rotation of the pinion 47, and the coin will drop from the pocket 14 into the coin receptacle.

Means are provided for controlling the movement of the power actuated means previously described, and for preventing violent or sudden operation, and as embodied this is effected by a magnetic brake mechanism. A pinion 86 meshes with gear 32, and a gear 87 is fixed to pinion 86. A pinion 88 is fixed on shaft 89 and meshes with gear 87. A disc 90 is likewise fastened on shaft 89, and a magnetic brake 91 acts on disc 90 to control its speed of rotation.

Means are also provided for closing a power circuit on the deposit of a coin and the actuation of the energy measuring gear 61. As embodied, a cam 94 is fixed on shaft 53, and cooperates with the angled end of a lever 95, this angled end permitting the cam to slide along the lever while remaining in operative relation thereto. Lever 95 is pivoted at 96, and is acted on by spring 97. Lever 95 acts on a spring switch 98, 99 provided with line terminals 100. When cam 94 rocks lever 95, switch arm 98 is moved inwardly, thereby closing the circuit at 100, and the arm is caught and held by the detent 101. When the purchased energy has been consumed, detent 101 will be rocked by suitable mechanism to release the spring arm 98 and the power circuit will be opened.

The manner of operation of the foregoing mechanism may be summarized as follows: A coin is dropped through the slot in casing 3 into the pocket 9, and a half rotation is imparted to the crank 17. Cylinder 7 thereby receives a half rotation and the coin drops into the pocket 14 in cylinder 12. At the same time shaft 8 and arm 21 are given a half rotation, placing spring 20 under tension, and pawl 23 imparts a half rotation to the free disc 22, which is then held by pawl 27, the pin 38 at the same time traveling idly in the arcuate slot 39. The rotation of disc 22 places spring 33 under tension as disc 22 is rotated and disc 31 is held. On the completion of the half rotation as described, crank 17 is stopped by pin 19, and at that time the arm 41 of lever 21 engages the tripping plate 40, and detent 35 releases disc 31 and gear wheel 32 for a half rotation until again stopped by the detent 35. In the meantime spring 20 has restored the previously-described mechanism to the position shown in Fig. 1. The driving action of the spring 33 is controlled by the braking or damping mechanism including the magnetic brake 91.

Broad faced pinion 47 is on a two-to-one ratio, and shaft 13 makes a complete rotation for each half rotation of the gear wheel 32, and this gives a complete rotation of the drum 12, the coin dropping from the pocket 14 and the pocket continuing to rotate back to the top position in line to receive the next coin from the pocket 9. As shaft 13 begins to rotate, shaft 53 turns with it, and lever 68 and bell-crank lever 72 are rocked to longitudinally move the two shafts and bring the head 48, acting as a gauge, up against the coin which is resting in pocket 14. This brings the corresponding pinion 58, 59 or 60 into mesh with the gear wheel 61, which is then rotated an amount proportional to the value of the deposited coin, a proportional amount of energy being thus rendered available to the customer. The coin detecting mechanism and the switch closing mechanism have already been described.

In Figure 2 of the drawing a modification is shown wherein the release of the power actuating mechanism is delayed until the crank 17, and the mechanism rotated thereby, is returned to initial position. The mechanism is substantially the same as that previously described, except that the spring detent 35 is omitted and a bell-crank detent 107 is pivotally mounted at 108 on the face of the gear wheel 32 and engages with the two notches 34 in disc 31. The tail of this detent 107 is engaged by the arm 41 when the mechanism is returned to initial position, as described, and the release of power actuating mechanism is delayed to that extent.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:

1. Energy vending mechanism comprising a driven gear wheel, a driving gear wheel, adjustable means interposed between said wheels for rotating the former from the latter, means for rotating said driving wheel, comprising a disk secured to said wheel, a member rotatable relative to said disk, spring means connecting said disk and member, locking means normally holding said disk against rotation, whereby rotation of said member will act to tension said spring means, manual means for rotating said member, means operated by said manual means for releasing said locking means, a coin receptacle for receiving coins of various sizes and means associated with said adjustable means and controlled in accordance with the diameter of a coin in said receptacle for setting said adjustable means.

2. Coin controlled vending mechanism, comprising a driven gear wheel, a driving gear wheel, means for driving said driving gear wheel, said driving means including a disk secured to the driving gear wheel, means normally locking said disk, a spring in driving relationship with said disk, manual means for tensioning said spring, said manual means including means for releasing said disk from its locking means after the spring has been tensioned a predetermined amount, selectively positionable means for connecting said driving and driven gear wheels in varying ratio, a coin receiving receptacle, and gauge means, engageable with different sized coins in said receptacle and operable by said selectively positionable means, for controlling the positioning of said positionable means in accordance with the diameter of a coin in the receptacle.

3. Coin controlled vending mechanism, comprising a driven gear wheel, a driving gear wheel, means for driving said driving gear wheel, including a disk secured thereto, means normally locking said disk, a spring in driving relationship with said disk, manual means for tensioning said spring, said manual means including means for releasing said disk from its locking means after the spring has been tensioned a predetermined amount, selectively positionable means, including a longitudinally movable shaft and a plurality of different sized gears thereon interposed between said gear wheels, and selectively engageable with the driven gear wheel, for connecting said driving and driven gear wheels in varying ratio, a coin receiving receptacle, and gauge means, engageable with different sized coins in said receptacle and with said longitudinally movable shaft, for controlling the positioning thereof in accordance with the diameter of a coin in the receptacle.

4. Coin controlled vending mechanism, comprising a driven gear wheel, a driving gear wheel, means connecting said driven and driving gear wheels, including a longitudinally movable shaft, a broad-faced pinion on said shaft in engagement with said driving gear wheel, the driving gear and said pinion being in 1 to 2 ratio whereby a half revolution of said driving gear effects a complete revolution of said shaft, manual means for effecting only a half revolution of said driving gear for each actuation thereof, said driving means further including a plurality of different sized gears on said shaft and rotatable therewith and selectively engageable with said driven gear wheel, in accordance with the longitudinal position of said shaft, and means for controlling the longitudinal position of said shaft, including a coin receptacle and gauge means, engageable wtih different sized coins in said receptacle and with said shaft.

5. The combination as claimed in claim 4, including also a normally open controlling switch and means, carried on said shaft, and operatively engageable with said switch, for closing it.

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