TRANSMISSION MECHANISM FOR VENDING OR LIKE MACHINES

INVENTORS

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This invention relates to transmission mechanism, its general object being to provide an improved handle-controlled construction of this character, especially, though not necessarily, designed for use in connection with vending and change making machines of the kind furnished with rotary magazine structures requiring that rotary movement be given thereto and with reciprocatory controlled carrier structures requiring that a drawing or advancing movement be imparted thereto.

The invention has for its object the provision of a handle-controlled transmission mechanism in which gearing parts are provided as the means through which to transmit the rotary movement of the handle to the rotary magazine structure, in which leverage is provided as the means through which to transmit the rocking movement of the handle into a drawing movement for the carrier structure, and in which a novel bearing support and sliding connection for the handle are so constructed and arranged that the gearing parts will not be disconnected during the rocking movement of the handle and also that the leverage parts will not be affected or actuated during the rotation of the handle.

A further object of the invention is the provision of a simple transmission mechanism of this character which will be easy to operate, reliable and positive in operation, and will not easily get out of order, and one in which the parts are especially constructed and arranged to secure increased power and dependability of action.

The present invention constitutes an improved construction over the transmission mechanism for a similar purpose disclosed in the application filed by Clifton W. Nixon on June 7, 1927, Serial No. 197,076, to which application reference may be had for more complete illustration and description of the movable magazine and reciprocatory carrier structures than are given herein. The present construction has been found by actual use to be highly efficient under all conditions of use and to possess many important features of advantage over the construction set forth in the Nixon disclosure.

Other objects will appear hereinafter. The invention consists in the details of construction and in the arrangement and combination of parts hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings forming a part of this specification, and in which:

Fig. 1 represents a vertical sectional view of a fragment of a vending and change making machine, showing our improved handle-controlled transmission mechanism in association with portions of a rotary magazine structure and a reciprocatory carrier structure, to be operated thereby;

Fig. 2 represents a view in elevation of a fragment of the casing front, showing the circular aperture and elongated slot therein for the operation of the handle;

Fig. 3 represents a sectional plan view of the handle-controlled transmission mechanism, this view being taken approximately on the line 3—3 of Fig. 1; and

Fig. 4 represents a cross section taken on the line 4—4 of Fig. 1.

Referring to Fig. 1, wherein we have shown sufficient portions of the rotary magazine structure and of the reciprocatory carrier structure to disclose a practical application of our improvements, 10 designates the top section of the rotary magazine 11, which is of skeleton form, said top section being mounted in any appropriate manner to rotate about or upon a central axis shaft 12; and in order to make provision for applying rotary movement to the magazine with a minimum of lost motion and with a high degree of smoothness, there is secured upon the section 10 an internal gear device in the form of a ring plate 13 having an inner depending flange 14 provided with closely spaced apertures 15 adapted to receive the rounded pins or studs 16 of the driven wheel 17. 18 designates the reciprocatory coin-controlled carrier structure, herein shown more or less diagrammatic in character. This carrier structure is mounted to slide to and fro be-
tween rails as 19, and in practice it is spring retracted (springs not shown) toward or against the front wall 20 of the casing and it has pivoted thereto at 21 a draw bar 22 hooked at 23 to receive the instrumentality by which the carrier structure will be drawn inwardly of the casing away from the front wall 20 and against the urge of its retracted springs.

Our invention, in its preferred form of construction as illustrated in the accompanying drawings, comprises an elongated block 24 holed through lengthwise to provide a long bearing for the rear portion of a handle 25, which extends therethrough and which is made near its front end, adjoining its knob or hand-grip 26, with a portion 27 of rectangular form in cross section designed to be rotated in a circular aperture 28 and to be introduced vertically or edgewise into a therewith communicating slot 29 in which it has intimate sliding fit, the said circular aperture 28 and slot 29 being provided both in the front wall 20 of the casing and in a front panel 30 secured thereto.

The bearing block 24 is formed at its rear end with an upwardly projecting half-round boss 31 holed transversely to receive an axis pin 32 mounted for turning movement in suitable bearings provided in the opposing side plates 33 and 34 comprising depending parts of a frame 35 which may be supported in any suitable manner, for instance, by an overhead cross beam 36 arranged within the casing structure. Under this arrangement, the handle can be rotated freely either to the right or to the left when it is in elevated position with its portion 27 occupying the extension 38, but after said portion 27 has been introduced into the slot 29 the handle is maintained against any turning movement whatever and can be moved only downwardly and upwardly.

According to an important feature of the invention, the boss 31 is secured rigidly to the axis pin 32 by screws 37 or other suitable means, so that both the bearing block 24 and axis pin 32 will turn in accompaniment with the strokes of the handle, made downwardly or upwardly in the slot 29. Now the axis pin 32 has an extension 38 which projects beyond the side plate 34, and to this extension is secured the end of a crank arm 39 which extends rearwardly as shown and is laden at its free end with a weight 40 sufficient to turn the axis pin and elevate the handle. Provision is thus made for normally maintaining the handle in elevated position, ready for rotation, and also for automatically elevating or repositioning it after each depression or down stroke when the operator removes his hand from the knob 26.

For the purpose of transmitting the rotary movement of the handle and yet permitting the down and up strokes thereof, we provide a sliding connection comprising a stem 41 carrying a blade or vane 42 with an arc-shaped rear portion adapted to have intimate sliding fit between two arc-shaped guides 44 projecting from a disk 45 which is secured to the element to be driven, in the present instance, to a stud shaft 46. The stem 41 of the blade is fixed in the rear end of the handle 25 while in the present instance the stud shaft 46 is operatively mounted in a bushing 47 fixed in an angular bracket 48 which is supported by the frame 35. Said stud shaft 46 carries a bevel gear 49 in driving engagement with a bevel gear 50 fixed on a vertical shaft 51 to which the pin wheel 17 is applied for driving the magazine structure. The vertical shaft 51 is shown as supported in brackets 45 and 52, of which the last-named is attached for its support to a cross piece 53 arranged within the casing.

Under this arrangement, when the handle is in elevated position, it can be employed to rotate the magazine structure freely, either to the right or to the left; and the bevel gears are in permanent engagement, even during the down and up strokes of the handle, since the sliding connection makes provision not only for transmitting the rotary movement of the handle but also for allowing it to have free play for its down and up strokes.

During its down stroke, the handle 25 is employed in the capacity of a lever for producing the power by which to cause the carrier structure 18 to be drawn or advanced from the front wall 20. This object is preferably accomplished through the provision of a linkage or toggle mechanism comprising a bell crank lever 54, and a link 56 which is pivotally connected at 57 to the long arm of the bell crank lever and at 58 to the draw arm 55. The bell crank lever is shown as produced with a hub portion 50 rockably mounted upon a pin 60 arranged in the side plates 33 and 34 forward of the axis pin 32, and its short arm has a slot 61 receiving a pin 62 carried by a lug 63 on the forward portion of the bearing block 24. The draw arm 55 has a hub portion 64 rockably mounted on a pin 65 arranged in the side plates 33 and 34 rearward of the axis pin 32. At its lower end said draw arm 55 is provided with a hook 66 adapted to interlock with the hook 23 of the draw bar 22, so that when the handle 25 is depressed in the slot 29, causing the pivotally connected bell crank lever, link and draw arm to be rocked rearwardly, the carrier structure will be drawn rearwardly away from the wall 20.

Near its front end, the side plate 34 has a cavity 66' in which are arranged a limitedly movable plunger 67 and a coiled spring 68 which forces the plunger outwardly for engagement with a recess or keeper 69 provided in the bearing block 24. The protruding end
of the plunger is appropriately rounded so that when engaged sharply by the bearing block it will yield inwardly to permit the bearing block to move out of or into elevated position. This plunger device, provided in position to interlock with the forward end of the bearing block, tends not only to stabilize the bearing block when it is in elevated position, but also to provide a desirable resistance at the beginning of the down stroke of the handle and at the end of the up stroke thereof.

The operation of the invention will be understood from the foregoing detailed description but it may be summarized as follows: The weighted crank arm projecting rearwardly from the axis pin with which the bearing block is made fast repositions the handle and all associated parts after each depression of the handle and it normally maintains the handle in elevated position where the plunger device stabilizes the bearing block and where the handle may be freely rotated to turn the magazine either to the right or to the left as desired. Depression of the handle, which can take place only after it has been properly aligned with the casing slot, operates the toggle mechanism whereby to cause advancing movement of the carrier structure. Because of the sliding connection, the weighted crank arm can be depended upon to reposition the handle completely within the circular aperture ready for rotation, and the handle can be manually moved from the circular aperture into the slot with ease and celerity.

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

Having thus described our invention, what we claim is:

1. Transmission mechanism for the purpose indicated comprising a handle mounted for both rotary and rocking movements; an element to be rotated; and a transversely extending sliding connection between said handle and said element arranged to transmit the rotary movement of said handle to said element and to allow free rocking movement of said handle.

2. Transmission mechanism for the purpose indicated comprising a handle mounted for both rotary and rocking movements; a rotatable element; a swingable element; means arranged to be operated by the rocking movement of said handle for actuating said swingable element; and a transversely extending sliding connection between said handle and rotatable element to transmit the rotary movement of the former to the latter and to allow rocking movement of said handle.

3. Transmission mechanism for the purpose indicated comprising a handle; a bearing block supporting said handle for rotation and mounted for rocking movement, to be induced by said handle; and means for receiving rotary movement arranged to be rotated by said handle and including a sliding transversely extending guide and vane connection adapted to allow free rocking movement of said handle with said block.

4. Transmission mechanism for the purpose indicated comprising a handle; a bearing block supporting said handle for rotation and mounted for rocking movement, to be induced by said handle; means for receiving rotary movement arranged to be rotated by the rotation of said handle including a sliding connection adapted to allow free rocking movement of said handle and block; and means independent of said handle for restoring said block to starting position.

5. Transmission mechanism for the purpose indicated comprising a handle; a bearing block supporting said handle for rotation and mounted for rocking movement, to be induced by said handle; means adapted to have a drawing action connected with said block and arranged to be rendered effective by the rocking movement thereof; and means for receiving rotary movement arranged to be rotated by the rotation of said handle and including a transversely extending sliding connection adapted to allow free rocking movement of said handle and block.

6. Transmission mechanism for the purpose indicated comprising a handle; a bearing block supporting said handle for rotation and mounted for rocking movement, to be induced by said handle; means for receiving rotary movement arranged to be rotated by the rotation of said handle including a sliding connection adapted to allow free rocking movement of said handle and block; and a weighted arm associated with said axis pin for normally maintaining said block in position to be given rocking movement.

7. Transmission mechanism for the purpose indicated comprising a handle; a bearing block supporting said handle for rotation and mounted for rocking movement, to be induced by said handle; means for receiving rotary movement arranged to be rotated by the rotation of said handle including a sliding connection adapted to allow free rocking movement of said handle and block; means independent of said handle for returning said block to starting position; and means for releasably stabilizing said block at starting position.

8. Transmission mechanism for the purpose indicated comprising a handle mounted
for both rotary and rocking movements; an element to be rotated; and a sliding connection between said handle and said element adapted to transmit the rotary movement of said handle to said element and to allow free rocking movement of said handle from and to one position of use, comprising a pair of arcuate guides and an arcuate vane having sliding fit between said guides.

9. In vending and like machines, the combination with a shaft adapted to be rotated and a bearing block supported by a pivot for rocking movement relatively to said shaft, of a handle supported for rotation in said block and adapted to rock the same; and interengaging means comprising a guide and a vane having sliding contact with each other carried by said handle and said shaft, whereby to transmit rotary movement from said handle to said shaft and to allow free rocking movement of said handle and block with respect to said shaft.

10. In vending and like machines, the combination with a shaft adapted to be rotated and a bearing block supported by a pivot for rocking movement relatively to said shaft, of a handle supported for rotation in said block and adapted to rock the same; interengaging means having sliding contact with each other carried by said handle and said shaft; and means for releasably stabilizing said block in fixed relation to said shaft.

11. In vending and like machines, the combination with a support, of a bearing block supported on said support by a pivot for rocking movement; a handle for imparting rotary movement journalled for rotation in said block and adapted to rock the same; a pull arm pivoted to said support; a bell crank pivotally connecting said block with said support; and a link pivotally connecting said bell crank with said pull arm, whereby rocking movement of said handle will actuate said pull arm.

12. In a vending or like machine, the combination with a support and a rotatable shaft, of a bearing block arranged on said support for rocking movement; a handle for imparting rotary movement journalled for rotation in said block and capable of rocking the same; a pull arm pivoted to said support; a bell crank link connected with said pull arm and pivoted to said support and said block, respectively, whereby rocking movement of said handle will actuate said pull arm; and interengaging means comprising members having sliding contact with each other carried by said handle and said shaft, whereby to rotate the latter from the former and to permit free rocking movement of the former.

13. In combination, a rotary structure and driving means therefor including a power receiving shaft; a pull structure with a cooperating draw arm for imparting movement thereto; a support having a bearing block mounted thereon for rocking movement; a handle by which to rock said block having rotation therein and protruding therefrom; means connecting said support, block and draw arm to cause the operation of said draw arm on the rocking of said handle; and interengaging members having sliding contact with each other carried by said handle and said power receiving shaft, whereby to rotate the latter from the former for the operation of the rotary structure and to allow free rocking of said handle for the operation of the pull structure.

14. Transmission mechanism for the purpose indicated comprising a handle; a bearing block supporting said handle for rotation and mounted for rocking movement, to be induced by said handle; a power receiving shaft; interengaging members having sliding contact with each other carried by said handle and power receiving shaft, whereby to rotate said latter from the former to allow free rocking movement of said handle; and means for preventing the rotation of said handle during its rocking movement.

15. Transmission mechanism for the purpose indicated comprising a handle; a bearing block supporting said handle for rotation and mounted for rocking movement, to be induced by said handle; a power receiving shaft; interengaging members having sliding contact with each other carried by said handle and power receiving shaft, whereby to rotate the latter from the former and to allow rocking movement of said handle; means for preventing the rotation of said handle during its rocking movement; and means affording an application of gravitational force for returning said handle and block to starting position after each rocking movement.

16. Transmission mechanism for the purpose indicated comprising a support; an elongated bearing block supported near one end by a pivot on said support; a handle for imparting rotary movement journalled for rotation in said block and adapted to rock the same; means for limiting the rocking movement of said handle; means affording an application of force for normally maintaining said block and handle in elevated position for starting their rocking movement; and a spring urged plunger arranged in said support for releasably interlocking with the free end portion of said block as it moves into elevated position.

In testimony whereof, we have signed our names to this specification.

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