Aug. 5, 1941. R. L. TRIMBLE 2,251,645

STEP-BY-STEP MECHANISM

Filed April 29, 1938 6 Sheets-Sheet 1

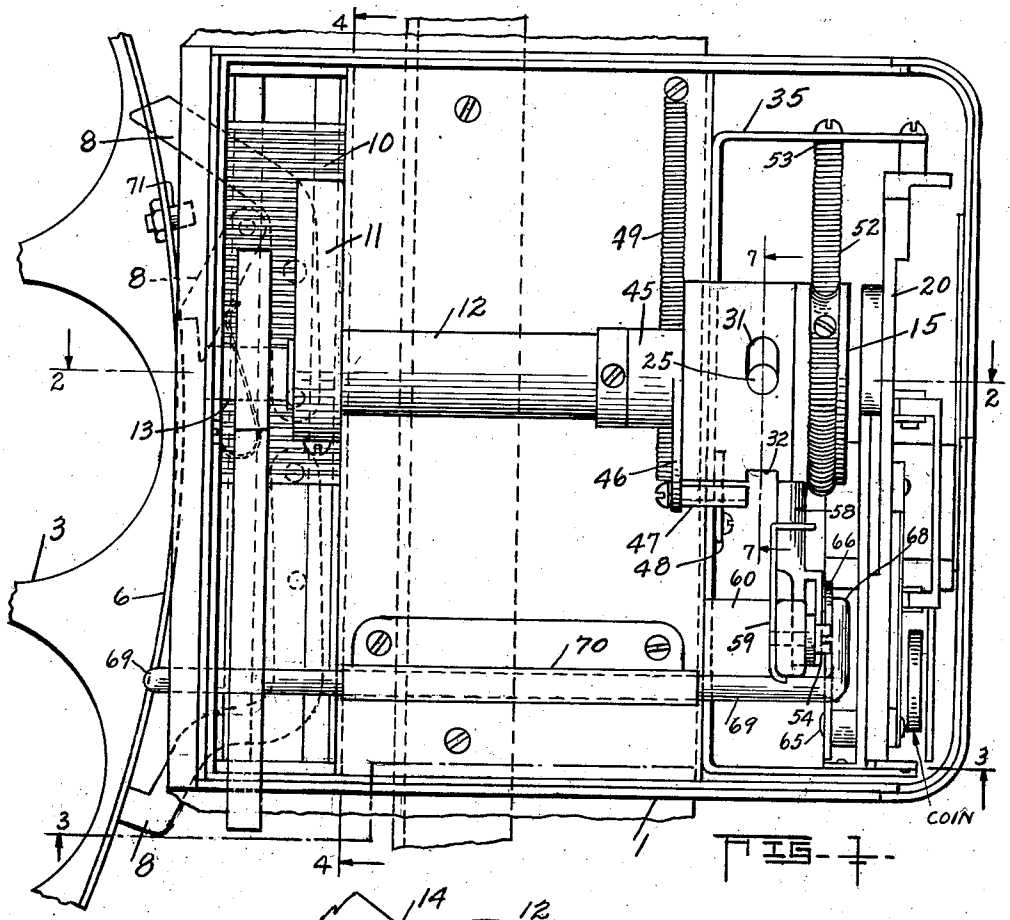


FIG. 1

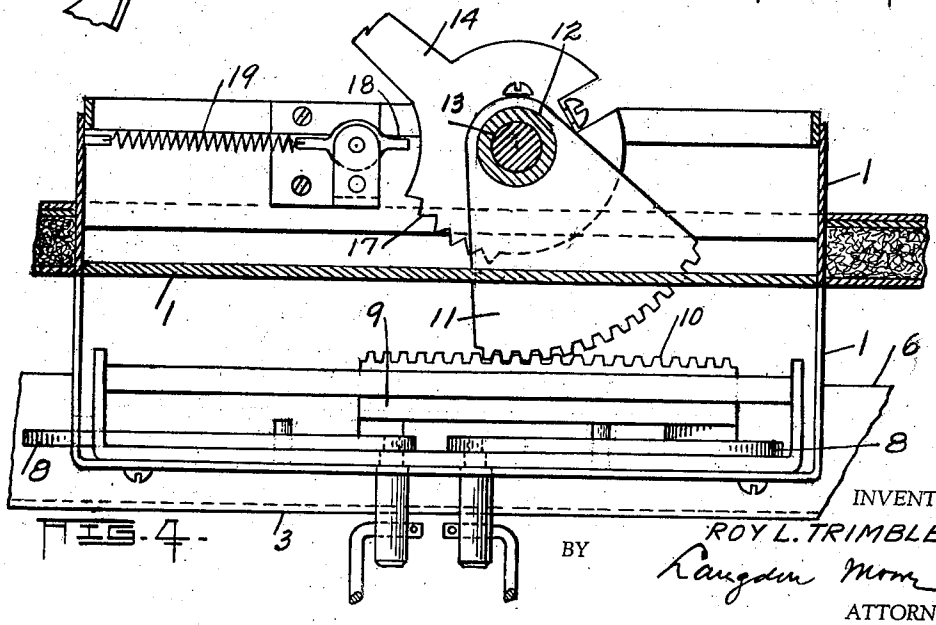


FIG. 4

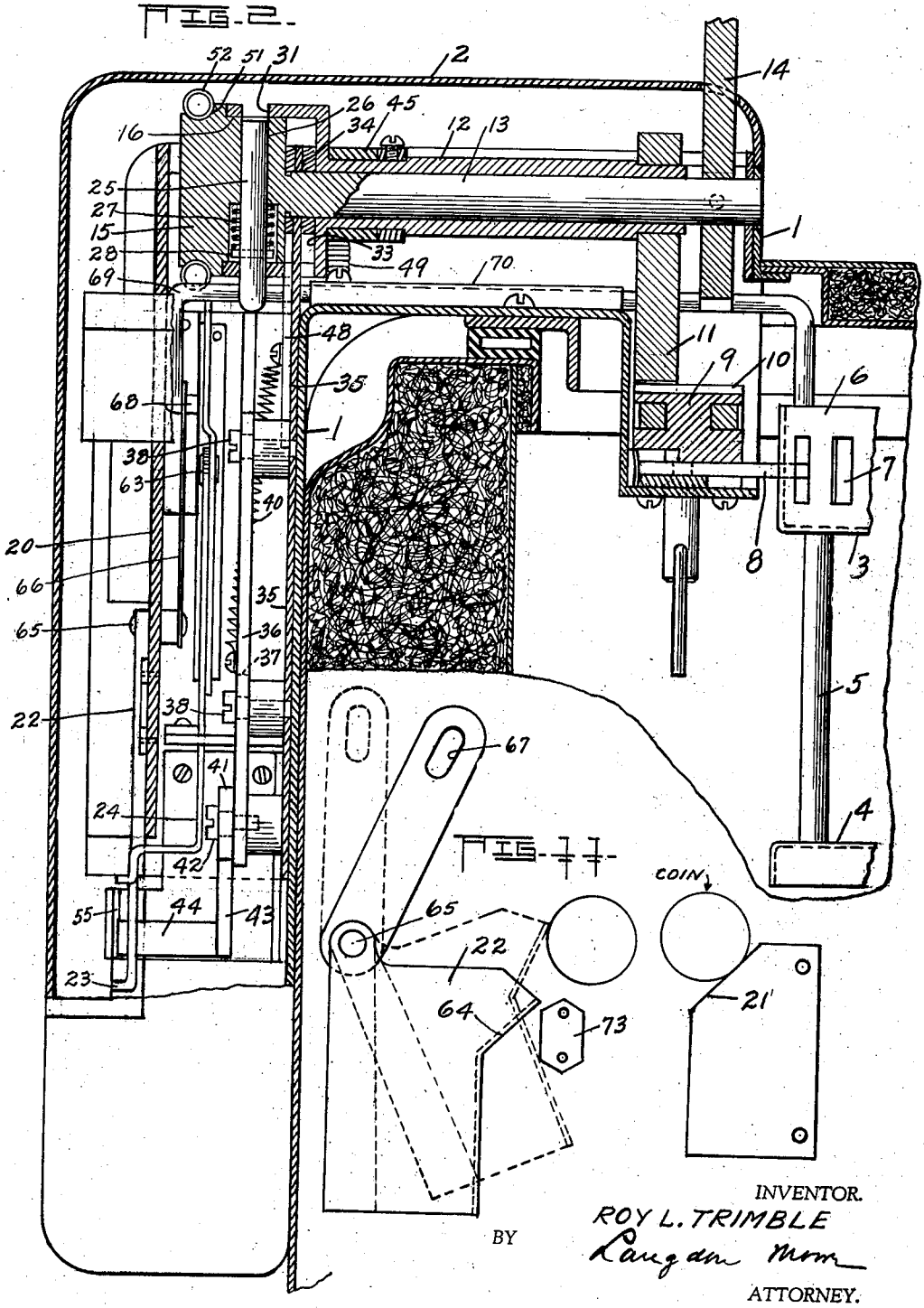
INVENTOR.
ROY L. TRIMBLE
BY
Langdon Morris
ATTORNEY.

Aug. 5, 1941. R. L. TRIMBLE 2,251,645

STEP-BY-STEP MECHANISM

Filed April 29, 1938 6 Sheets-Sheet 2

FIG. 2.



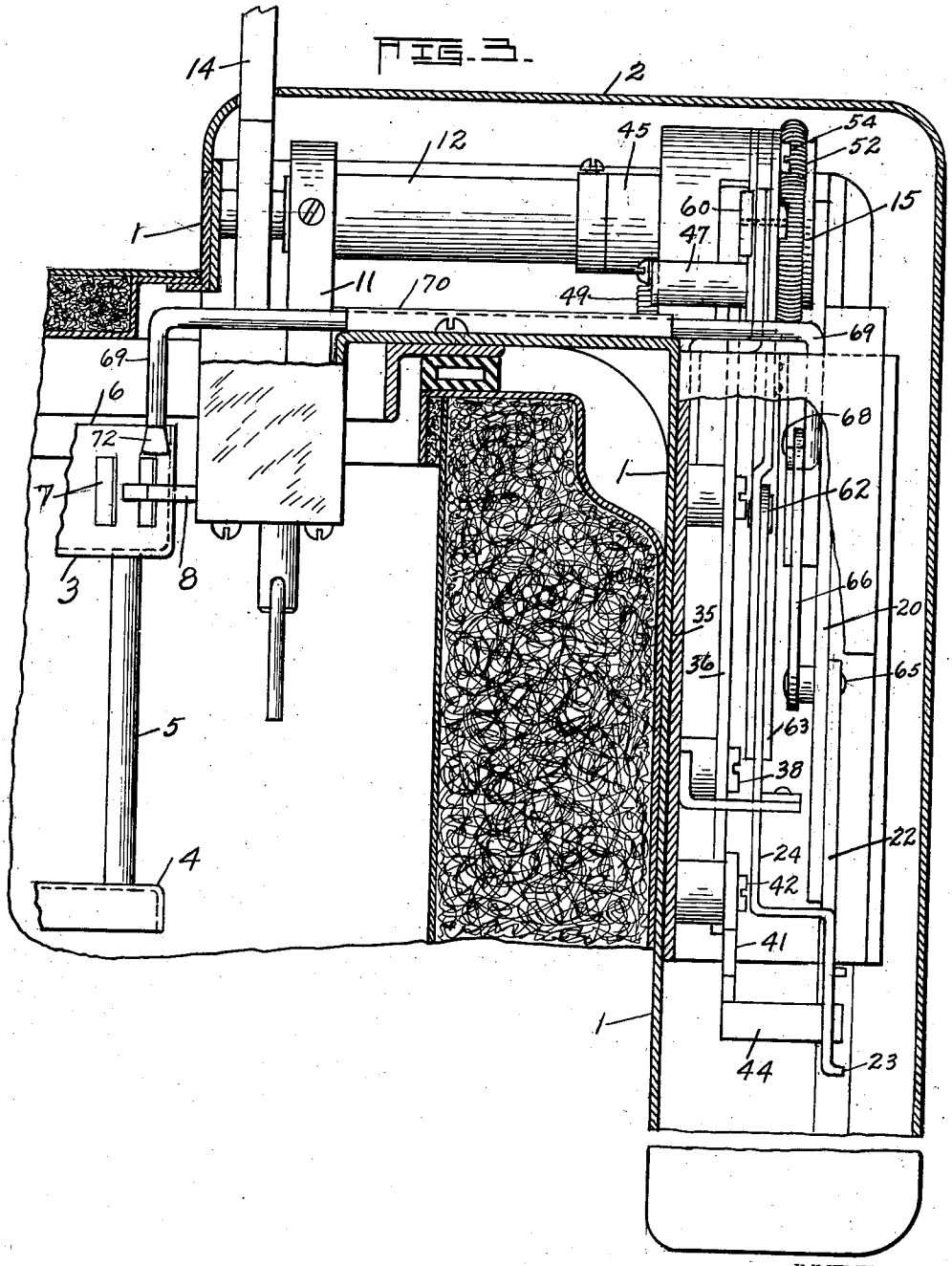
INVENTOR.
ROY L. TRIMBLE
BY Langdon Morris
ATTORNEY.

Aug. 5, 1941. R. L. TRIMBLE 2,251,645

STEP-BY-STEP MECHANISM

Filed April 29, 1938 6 Sheets-Sheet 3

FIG. 3.



INVENTOR.
ROY L. TRIMBLE

BY Langdon Munn

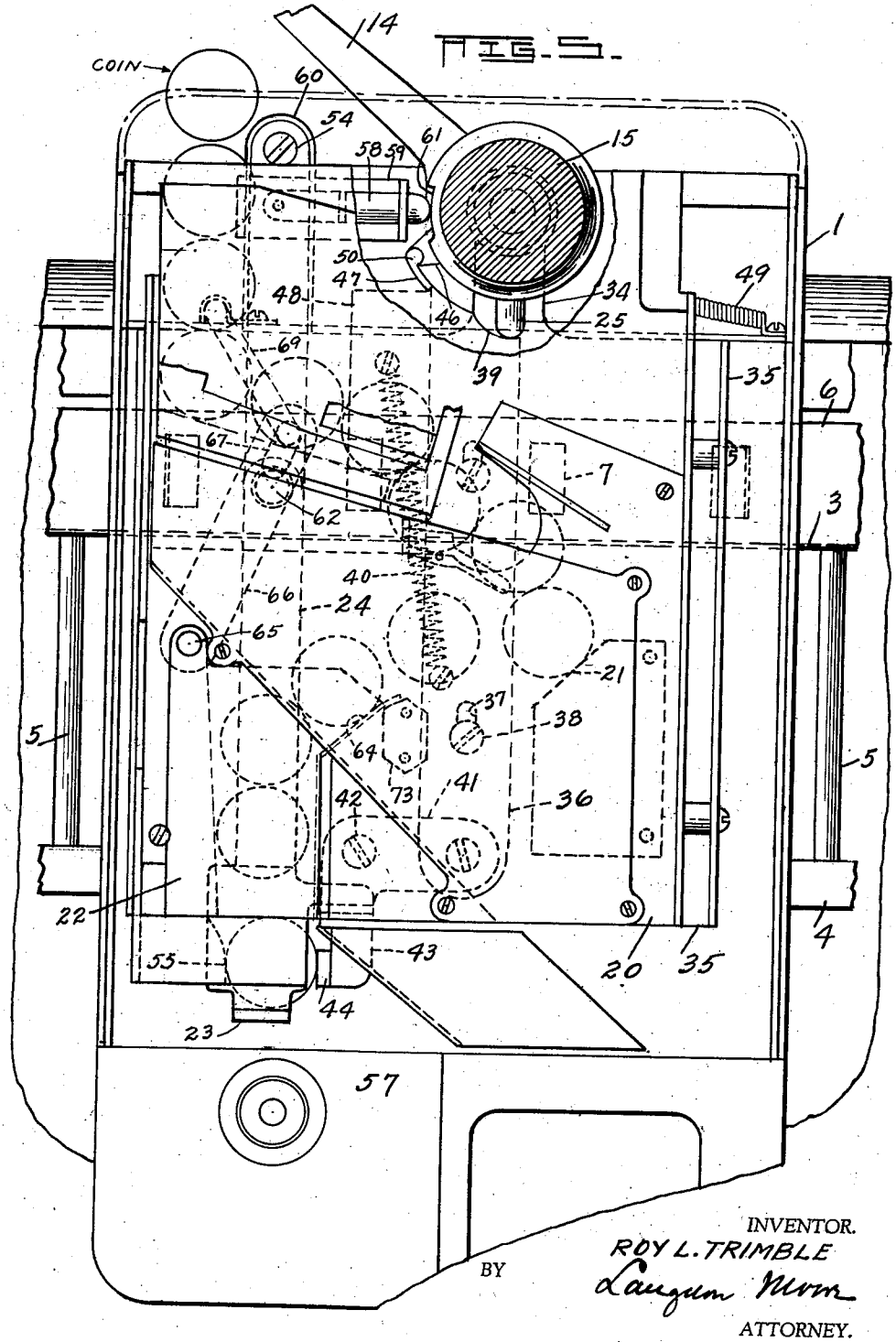
ATTORNEY.

Aug. 5, 1941. R. L. TRIMBLE 2,251,645

STEP-BY-STEP MECHANISM

Filed April 29, 1938 6 Sheets-Sheet 4

FIG. 5.



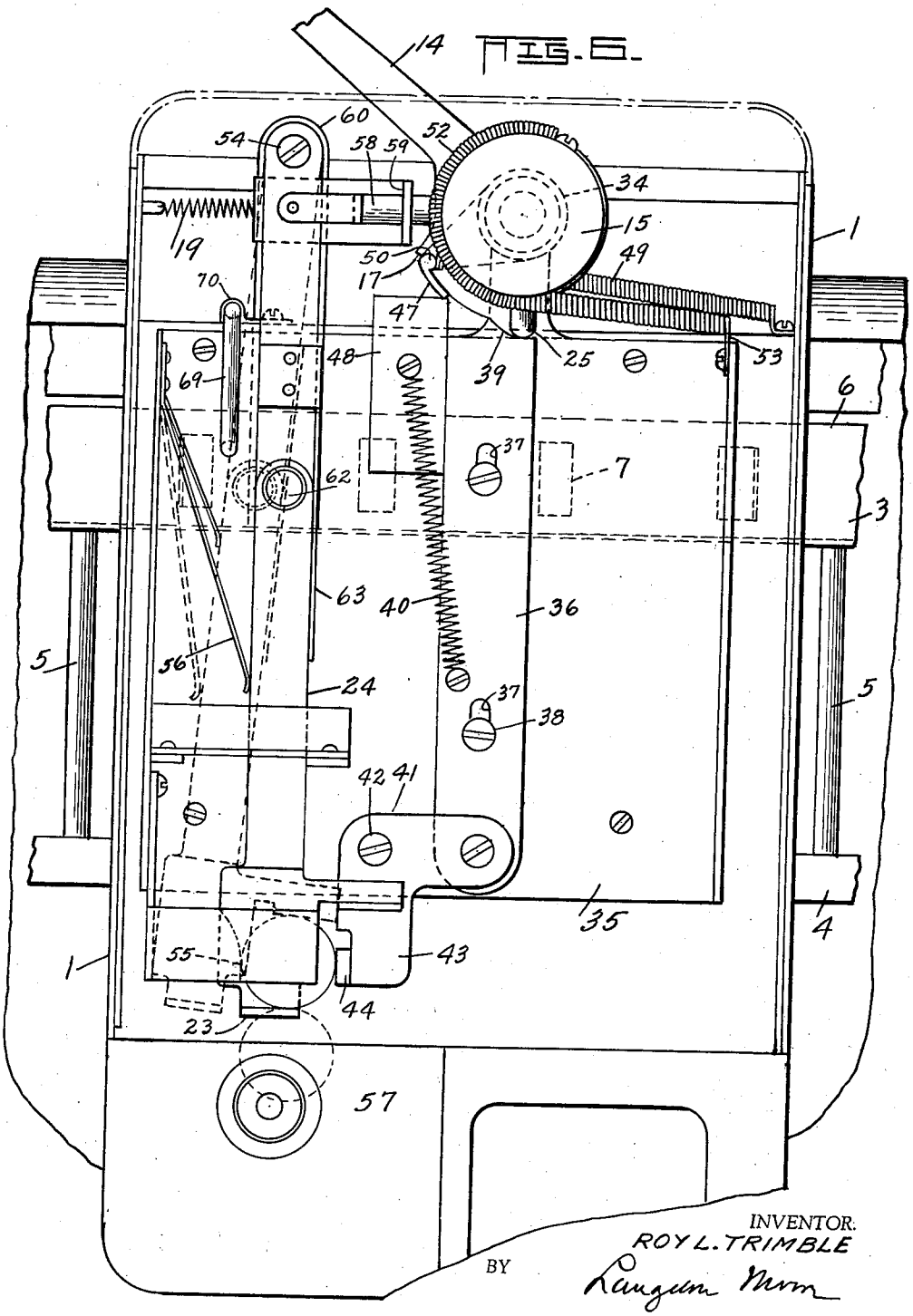
INVENTOR.
ROY L. TRIMBLE
BY
ATTORNEY.

Aug. 5, 1941. R. L. TRIMBLE 2,251,645

STEP-BY-STEP MECHANISM

Filed April 29, 1938 6 Sheets-Sheet 5

FIG. 6.



INVENTOR.
ROY L. TRIMBLE
BY
Langdon Mann
ATTORNEY.

Aug. 5, 1941. R. L. TRIMBLE 2,251,645

STEP-BY-STEP MECHANISM

Filed April 29, 1938 6 Sheets-Sheet 6

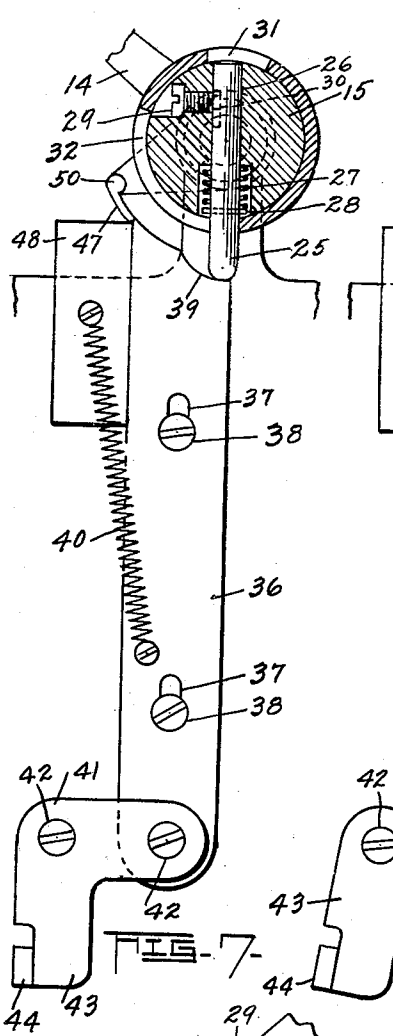


FIG. 7.

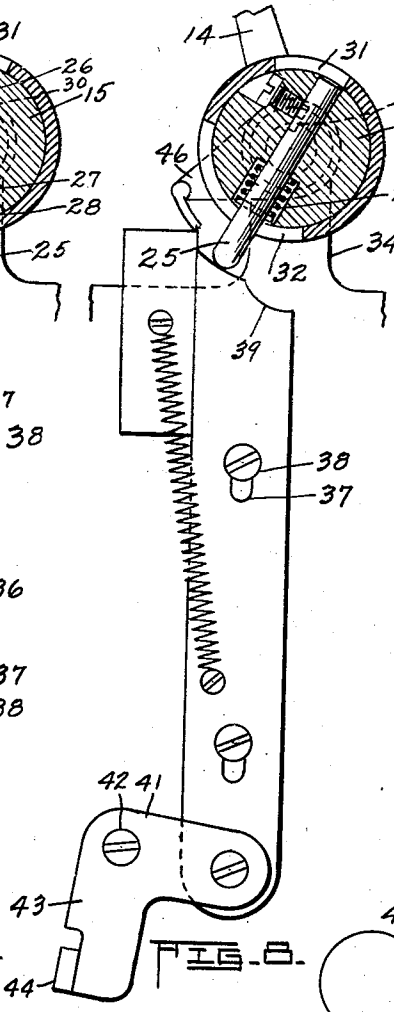


FIG. 8.

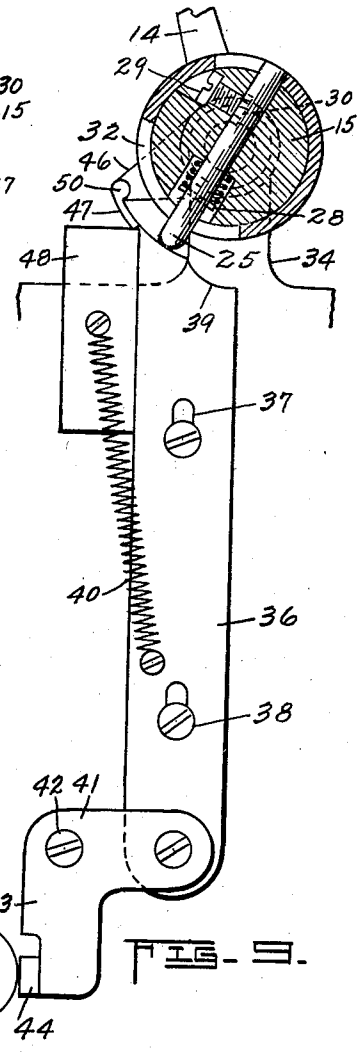


FIG. 9.

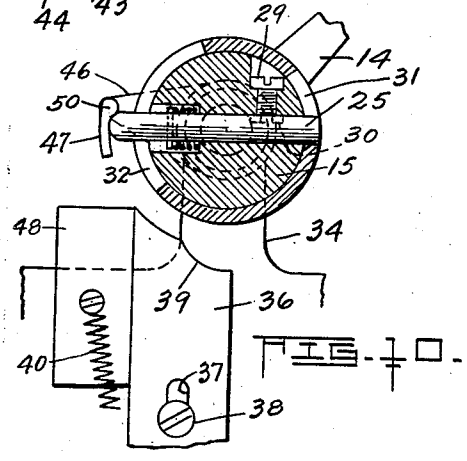


FIG. 10.

BY

INVENTOR.
ROY L. TRIMBLE
Langner Mann
ATTORNEY.

Patented Aug. 5, 1941 2,251,645

UNITED STATES PATENT OFFICE

2,251,645

STEP-BY-STEP MECHANISM

Roy Lane Trimble, Bloomington, Ill., assignor to Williams Oil-O-Matic Heating Corporation, Bloomington, Ill., a corporation of Illinois

Application April 29, 1938, Serial No. 204,940

14 Claims. (Cl. 194—72)

This invention relates to improvements in dispensing cabinets having a step-by-step movement and more particularly to the mechanism for operating the step-by-step movement.

It is an object of this invention to provide a dispensing cabinet designed to completely enclose the articles contained therein and prevent the removal of an article until a coin is deposited, which will release a manual operator to impart a step-by-step movement whereby the articles are successively dispensed one at a time and which requires the deposit of a coin each time before an article may be removed from the cabinet.

With these and other objects in view, reference is made to the accompanying sheets of drawings which illustrate a form of this invention with the understanding that detail changes may be made without departing from the scope thereof.

In the drawings:

Figure 1 is a top plan view of a casing, with cover removed, containing the manually operated mechanism for actuating a step-by-step movement shown in association with a turn table of a dispensing cabinet, rotated by the step-by-step mechanism, with parts broken away.

Figure 2 is a view in vertical section taken on the line 2—2, Figure 1, looking in the direction of the arrows.

Figure 3 is a similar view taken on the line 3—3, Figure 1, looking in the direction of the arrows.

Figure 4 is a view partly in end elevation and partly in vertical section, taken on the line 4—4, Figure 1.

Figure 5 is a view in front elevation of the mechanism casing, with cover removed, showing a coin chute for directing a coin into position to render the manual means operable to actuate the step-by-step movement and with the enlarged end of the manually operated shaft shown in vertical section and with the front of the dispensing cabinet broken away.

Figure 6 is a similar view of the casing with the plate mounting the coin chute removed, showing in full lines a coin in position to render the manual means operable, and in dotted lines the position of the coin retainer after it has released a coin.

Figure 7 is a detail view in vertical section of the manually operated shaft and sleeve connection taken on the line 7—7, Figure 1, looking in the direction of the arrows, and showing in elevation the reciprocating cooperating cam plate in normal position before a coin has been deposited.

Figure 8 is a view similar to Figure 7 illustrating the position of the parts shown in Figure 7 after movement of the manually operated shaft has been initiated.

Figure 9 is a similar view illustrating the position of the parts after a coin has been deposited to render the mechanism operable, as shown in Figure 6, and the movement of the manually operated shaft has been initiated.

Figure 10 is a view similar to Figure 9, with parts broken away, illustrating the position assumed by the parts when the initial movement has been continued and approaches completion.

Figure 11 is a detail diagrammatical view in elevation illustrating in full lines the normal relation of the coin ejector, abutment and anvil shown in Figure 5, and in dotted lines the position of the ejector when moved into operative position after the last article has been removed from the cabinet.

In the embodiment of the invention illustrated upon the drawings, the mechanism for operating the step-by-step movement is contained in an L-shaped casing 1 having an L-shaped cover 2 upon the upper and outer sides of the casing. The casing is designed to be supported upon a side of the dispensing cabinet with the shorter leg of the L secured upon the top of the cabinet and the other leg of the L in engagement with a side of the cabinet, as shown in Figures 2 and 3. Within the cabinet shown in Figures 1, 2 and 3, a cylindrical rotating article carrier is mounted, preferably including trays 3 and 4 spaced apart from each other by a plurality of posts 5. The upper tray 3 is provided about its circumference with an upstanding annular flange 6 having equally spaced apertures 7 adapted to be engaged by the pivoted dogs 8 carried by the step-by-step movement carried within a depending portion of the casing 2. The step-by-step movement shown includes a reciprocating bar 9 which mounts the intermediate dog 8 for engagement with an opening 7 in the flange 6 to impart movement to the trays 3 and 4. It is preferable to construct the step-by-step mechanism actuated by the movement of the reciprocating bar 9 in the manner disclosed in Patent 2,152,818 of Chester A. Ropp, and also owned by the assignee of this application, and, therefore, needs no detail description other than the statement that the upper surface of the bar 9 is provided with a rack 10 meshing with a segment gear 11 carried on one end of a sleeve 12 rotatably mounted upon an operating

shaft 13 mounted in horizontal position in bearings within the top and shorter leg of the L-shaped casing 1. The operating shaft 13 adjacent the segment gear 11 mounts an operating handle 14 which extends through an opening provided therefor in the removable cover 2 and may be keyed to the shaft or secured thereto by a set screw, as shown in Figure 4. The other end of the operating shaft 13 extending above the vertical portion of the casing is provided with a concentric enlarged head 15. The portion of the sleeve 12 adjacent the enlarged head 15 is concentrically expanded to surround and contain a reduced shouldered portion 16 of the head 15, as shown in section in Figure 2. Reciprocating means is mounted within the enlarged head 15 adapted to engage and disengage the sleeve 12 to the shaft 13, as hereinafter described. When the shaft 13 is engaged to the sleeve 12, the handle 14 may be manually operated to oscillate the segment gear 11 to reciprocate the bar 9. It is preferable to provide a portion of the handle 14 concentric with the shaft 13 with an arcuate rack 17, the teeth of which are adapted to wipe over a pawl 18 pivotally mounted upon the casing 1, as shown in Figure 4. The pivoted pawl 18 is a double-acting pawl and normally maintained in the position shown in Figure 4 by the spring 19, whereby, when movement to the operating handle in one direction has been initiated, the pawl 18 will engage a tooth of the rack 17 to prevent counter-movement until the original movement imparted to the handle has been completed and vice versa.

From the above, it is seen that when the shaft 13 is not in operative engagement with the sleeve 12, the handle 14 may be operated without imparting any movement to the bar 9 of the step-by-step movement. In order that the depositing of a coin may complete an operative engagement between the sleeve 12 and shaft 13, a coin chute mechanism for selecting and directing a coin into the desired position to render the step-by-step mechanism operative, is mounted upon a plate 20 within the vertical or longer leg of the casing 1. This coin chute mechanism for selecting and directing a coin and the plate carrying the same is of commercial construction and forms no part of this invention, and, therefore, only a brief description of the same is required. This mechanism is illustrated in elevation upon the plate 20 in Figure 5 with parts broken away, and the path of coins passing through this mechanism is illustrated in dotted lines showing a coin passing through an aperture provided therefor in the cover 2, and traveling in a vertical direction into the interior of the casing to be engaged by a directional portion of the commercial mechanism to deflect its course until the coin strikes the angular surface of an anvil 21, also forming part of the commercial mechanism, from which a coin is deflected into a coin-receiving chute 22 to then pass in a vertical direction to be engaged by the angular foot 23 of a pivoted coin-retaining lever 24 to retain the coin in position to render the manually actuated step-by-step mechanism operative.

The reciprocating means mounted within the head adapted to engage and disengage the sleeve 12 to the shaft 13, above referred to, includes a pin 25 mounted in a passage 26 extending through a diameter of the head and normally projecting from the under side thereof under tension of a coil spring 27 surrounding the pin within an enlarged portion of the passageway 26 on the under side and bearing upon a collar 28 secured upon the pin. The movement of the pin is limited by a set screw 29 entering through the side of the head 15 to engage in a slot 30 in the pin. The spring 27 normally maintains the pin with the upper end of the slot in engagement with the stop or set screw 29. The portion of the sleeve 12 extending over the pin on the upper side is cut away to form a slot 31 to receive the upward end of the pin 25 when at the end of its movement in that direction so that upon rotation of the shaft the end of the pin when extended will engage one end or the other of the slot 31. The under side of the sleeve is provided with a corresponding slot 32 for the passage of the pin on the under side and with an additional slot 33 for the passage of the forward bearing member 34. A cam plate for cooperation with the pin 25 is mounted upon the back plate 35 secured to the back of the vertical portion of the casing 1. This cam plate is in the form of a reciprocating bar 36 having elongated slots 37 adapted to travel over screw-headed posts 38 carried upon the back plate 35 so that the bar will reciprocate in a vertical direction with one edge approximately in alignment with a diameter of the head 15. The upper edge forms a cam track 39 adapted to be traveled over by the end of the pin 25. The cam track 39 is held in engagement with the end of the pin 25 by a coil spring 40 secured to the bar 36 intermediate the bearing pins 38 and an upper portion of the back plate 35. This spring normally maintains the bar 36 at the end of its upward movement and when the operating handle of the shaft 13 has been rotated to the end of its movement preparatory to reciprocating the step-by-step mechanism, the pin 25 is in a vertical position and the lower end is in engagement with the lower end of the cam track 39. If the handle 14 is operated while the parts are in this position, the tension upon the spring 27 is sufficient to cause the end of the pin riding over the cam track to depress the bar 36 to the lower end of its movement, and upon oscillation of the handle in the opposite direction, the end of the pin again engages the top of the cam track and first depresses the bar and then allows it to return to its uppermost position, as shown in Figure 7. The lower end of the bar 36 is pivotally mounted upon one arm 41 of a bell crank lever pivotally mounted at its apex upon a stud 42 carried on the back plate 35 with the other arm 43 of the lever held in the vertical position when the bar 36 is at the end of its upward travel. The lowermost portion of the arm 43 is provided with an angular extension 44 adapted to be engaged by a coin when the coin is held in position shown in Figure 6, by resting upon the upper side of the angular foot 23 of the coin retaining lever 24. As long as the coin is held in this position and the handle 14 is moved in the direction to operate the setp-by-step movement, the cam track 39 is held immovable by the connection between the lower end of the bar 36 and the other end of the bell crank lever 41, as shown in Figure 9, and the movement of the head 15 will cause the end of the pin 25 to ride over the cam track 39 and extend the other end of the pin into the slot 31 so that the end of the pin engages the portion of the sleeve 12 at the end of the slot and will impart a rotation of the sleeve in unison with the shaft 13. As long as the end of the pin 25 is traveling over the cam track 39, the tension of the spring 27 is increased, and to prevent it returning the pin to its normal position as the end of the pin travels beyond the cam

track 39, a retainer for the pin is provided. This retainer includes a sleeve 45 rotatably mounted upon the sleeve 12 at the rear of the enlarged portion, as shown in Figures 1 and 2. This sleeve is provided with a radially extended arm 46 having an angular foot 47 at the free end thereof, which normally forms an extension of the cam track 39 and is normally held in engagement therewith by the upper edge of a plate 48 mounted upon the back plate 35. The retainer is normally held in this position by a spring 49 engaging the end carrying the end of the arm 46 on the side opposite the foot 47 passing under the sleeve 45 and is secured to the bottom of the casing 1 adjacent the side most distant from the foot 47. When the head 15 is rotated to cause the pin to pass beyond the cam track 39, as shown in Figure 9, the end of the pin engages the upper side of the retaining foot 47, as shown in Figure 10, until the short handle 14 has completed the movement in that direction. The upper side of the foot 47 is enlarged to form a stop 50 to prevent the end of the pin passing therebeyond and will be held by the tension of the spring 49 in contact with the pin 25 until the handle has been reciprocated in the opposite direction to again return the end of the pin to engage the cam track 39. The head 15 adjacent the exterior end is provided with a circumferential groove 51 in which is mounted a coil spring 52 secured at one end in the upper side of the circumferential groove and is passed about the head within the circumferential groove to an anchor 53 formed on the back plate 35 whereby the handle 14 is normally held at one end of its movement with the pin 25 in the extended position, as shown in Figures 6 and 7, and when the handle is rotated to the other end of its travel, tension will be placed upon the spring 52 to return the handle to its first position when it is released.

In the event that the handle is operated before a coin is deposited, the pin 25 in the head 15 will depress the bar 36, as shown in Figure 8, without extending the pin to engage in the slot 31, and tension of the spring 27 will maintain the pin in this position and allow the handle to complete an oscillation without operating the step-by-step mechanism.

The coin retaining lever 24 is pivoted at its upper end upon a stud 54 and is normally held with its angular foot 23 to retain a coin in operative position with one side in engagement with the extension 44 and the opposite side in engagement with an abutment or bearing 55 upon the side of the lever 24 opposite the pivoted bell crank lever. The lever 24 is caused to rotate about its pivot 54 away from the bell crank lever extension 44 to release a coin to drop into the coin receptacle 57 after the handle 14 has moved sufficiently to initiate the movement of the pin 25 to engage the sleeve 12 by a pin 58 pivotally mounted at one end upon the lever 24 adjacent its pivot 54 and passing through a bracket 59 carried upon a bracket 60 mounted on the base plate 35 to cause the free end of the pin 58 to engage in a depression 61 upon the outer surface of the enlarged portion of the head 15 when the lever 24 is idle and the handle 14 is in the position shown in Figure 5. When the handle 14 is moved to the right upon initiation of movement the pin 58 rides out of the depression and travels upon the exterior of the surface of the head 15 to swing the lever 24 against the tension of spring 56 shown in Figure 6. This depression 51 is so arranged that this action takes place just after the pin 25 engages the slot 31 so that after movement is imparted to the segment gear 11, the coin is released. The double-acting pawl 18 and segmental rack 17 prevent a reverse movement being imparted to the handle 14 until the bar 9 of the step-by-step movement has completed its movement in one direction. The pressure of the spring 56 immediately returns the lever 24 into its operative position as soon as the handle 14 has returned to its idle position and allows the end of the pin 58 to enter the depression 61. In the event that a coin is improperly directed and jams the lever 24 in its operative position, it would prevent the pin 58 from riding out of the depression 61 and to prevent such an action the lever 24 is formed in two sections pivoted to each other by the pivot 62, as shown in Figure 6, and the two sections are maintained in alignment normally by the flat spring 63 engaging the sides of both sections adjacent the bar 36 so that if the lower end of the lever 24 is held in the position shown in Figure 6, the pivot 62 will allow the upper portion to be rotated about its pivot 54 when the pin 58 passes out of the notch 61.

In order to prevent a coin from assuming the operative position on the coin retaining lever 24 after the last receptacle has been removed from the cabinet, the coin chute 22 includes a spout 64 extending in the direction of the approaching coin and normally adapted to receive the coin within the chute, as shown in the diagrammatical view of Figure 11. The coin chute 22 is mounted on a stud 65 passing through an aperture therefor in the mechanism plate 20 and mounts upon the other side of the plate an upwardly extending arm 66 provided with an elongated slot 67 adjacent its free end to receive a bent-in end 68 of an arm 69 which extends upwardly adjacent the back of the plate 20 and then at right angles thereto to pass through a bearing 70 upon the bottom of the casing 1 to extend therebeyond into the interior of the dispensing cabinet where it is continued at right angles and in a vertical position to be terminated just below and adjacent the exterior of the top of the annular flange 6 upon the table 3. The table 3 is provided with a stud or abutment 71 so positioned that as the step-by-step movement advances the last article into a dispensing position, the abutment 71 engages the end 72 of the rod 69, and in wiping thereover imparts a rotation to the bent portion at its opposite end in engagement with the slot 67 of the arm 66 to impart a movement thereto which in turn raises the spout 64 to the position shown in dotted lines in Figure 11. Thereafter, the coins, after striking the anvil, will not be directed into the coin chute but will be engaged by the under side of the spout 64 to fall upon an abutment 73 upon the coin mechanism plate 20 and thereafter be directed to the chute forming part of this mechanism to return the coin to the operator. By this means, the operating handle may be oscillated without actuating the step-by-step operating mechanism and all coins deposited will be immediately returned.

In the operation of the mechanism above described a coin is inserted into the coin-receiving chute 22 to pass in a vertical direction for engagement with an angular foot 23 of the pivoted coin-retaining lever 24, the foot 23 retaining the coin in position thereon. The handle 14 is thereafter rotated and since the coin is in position on the foot 23 of the coin-retaining lever 24 adjacent the abutment or bearing 55 the bar 36 will

be held against vertical movement by the bell crank lever 42, one arm of the lever abutting against a portion of the periphery of the coin which is held stationary by the abutment 55. Since the bar 36 is held stationary the projecting end of the connector pin 25 will ride on the cam surface 39 at the end of the bar 36 through the positions of movement illustrated in Figs. 7, 9 and 10 to effect an operative connection between the sleeve 12 and the shaft 13 so that a movement of the operating handle 14 will rotate the sleeve 12. A rotation of the sleeve 12 carries therewith the oscillating actuator or segment gear 11 which, in turn, being engaged with the rack 10 causes a movement thereof positively in two directions for the step-by-step movement of the cylindrical rotating article carrier in this instance shown as spaced trays 3 and 4.

Should an operation of the handle 14 be effected when a coin is not in position on the foot 23 of the coin-retaining lever 24, the bell crank lever 41 is movable to the position shown in Fig. 8, permitting a downward movement of the bar 36 when the cam at the end thereof is operated upon by the extending end of the connector pin 25. The compression spring 27 surrounding the connector pin 25 is sufficiently strong to overcome the tension of the coil spring 40 so that the connector is not moved diametrically into engagement with the slot 31 as is the case where a coin has been inserted, as shown in Fig. 9.

When a coin has been inserted in the coin control mechanism and movement of the connector to cause engagement between the sleeve and the shaft has been made so that the end of the connector pin 25 engages the chute 47, the coin is released from the coin-retaining lever 24 through movement of the lever in a direction away from the bell crank lever 41 by engagement of the pin 58 on the cam surface afforded by the enlarged portion of the head 15 adjacent the depression 61. The position of the lever 24 at which point the coin is released therefrom is shown in dotted lines in Fig. 6. In order that the lever 24, in its operative position, be prevented from jamming, the lever is divided into a plurality of sections resiliently held in an operative condition by the spring 63, shown more particularly in Fig. 6. Further, after a predetermined number of cycles of movement of the operating mechanism, such for example as when the trays 3 and 4 are empty, further reception of coins in the coin chute will be deflected from the coin chute and engaged by the under side of the spout 64 so that the coin will be returned to the operator.

From the above it is readily seen that this invention provides a mechanism for operating a step-by-step movement of any desired character, although it is herein disclosed as being applied to impart a step-by-step movement to a turn table for supporting and advancing articles within a dispensing cabinet whereby the articles are dispensed one at a time. The mechanism allows a free rotation of the operating shaft prior to the depositing of a coin without actuating the step-by-step mechanism. The combination of the parts is such that when a proper coin has been deposited, it is directed into a position whereby the oscillation of the operating shaft thereafter will impart a movement to the step-by-step mechanism and this movement must be completed before the operating shaft may return to its starting position. The mechanism is also provided with means cooperating with the turn table whereby, after the last article has been dispensed, the mechanism will remain inoperative and a coin deposited will be returned to the operator until the dispensing cabinet has been refilled and the turn table has been re-set to re-cycle its step-by-step movement. While the mechanism for operating the step-by-step movement is retained in a casing particularly adapted for the purpose described, the shape or form of the casing may be altered to adapt this mechanism to other forms wherein the step-by-step movement is desired, without departing from the scope of this invention.

What I claim is:

1. In an operating mechanism for imparting a step-by-step movement, a manually actuated rotatable operating shaft, an apertured sleeve rotatably mounted on said shaft, an oscillating actuator secured to said sleeve for movement therewith, a normally inoperative connector movably engaged in an opening in said shaft, and a coin-controlled means mounted independently of said shaft and sleeve and having a portion thereof disposed in the path of movement of said connector, said coin-controlled means being normally held against movement in the path of movement of said connector upon reception of a coin therein to move said connector into the aperture of said sleeve thereby forming an operative connection between said sleeve and shaft for operating said oscillating actuator upon rotation of said shaft in one direction.

2. In an operating mechanism for imparting a step-by-step movement, a manually actuated rotatable operating shaft, an apertured sleeve rotatably mounted on said shaft, an oscillating actuator secured to said sleeve for movement therewith, a connector movably engaged in an opening in said shaft, resilient means for holding said connector normally inoperative, and a coin-controlled means mounted independently of said shaft and sleeve and having a portion thereof disposed in the path of movement of said connector, said coin-controlled means being normally held against movement in the path of movement of said connector upon reception of a coin therein to move said connector into the aperture of said sleeve thereby forming an operative connection between said sleeve and shaft for operating said oscillating actuator upon rotation of said shaft in one direction.

3. In an operating mechanism for imparting a step-by-step movement, a manually actuated rotatable operating shaft, an apertured sleeve rotatably mounted on said shaft, an oscillating actuator secured to said sleeve for movement therewith, a normally inoperative connector movably engaged in an opening in said shaft, a coin-controlled means mounted independently of said shaft and sleeve and having a portion thereof disposed in the path of movement of said connector, said coin-controlled means being normally held against movement in the path of movement of said connector upon reception of a coin therein to move said connector into the aperture of said sleeve thereby forming an operative connection between said sleeve and shaft for initiating operation of said oscillating actuator upon rotation of said shaft in one direction, and means on said sleeve and rotatable therewith for holding said connector in its aperture-engaged position during completion of the period of rotation of said shaft in the same direction.

4. In an operating mechanism for imparting a step-by-step movement, a manually actuated rotatable operating shaft, an apertured sleeve ro-

tatably mounted on said shaft, an oscillating actuator secured to said sleeve for movement therewith, a normally inoperative connector movably engaged in an opening in said shaft, and a coin-controlled means mounted independently of said shaft and sleeve and having a portion thereof disposed in the path of movement of said connector, said coin-controlled means being normally held against movement in the path of movement of said connector upon reception of a coin therein to move said connector into the aperture of said sleeve thereby forming an operative connection between said sleeve and shaft for operating said oscillating actuator upon rotation of said shaft in one direction and said coin-controlled means being movable out of the path of movement of said connector when a coin is not received therein whereby said connector remains in its normal inoperative condition upon movement of said shaft.

5. In an operating mechanism for imparting a step-by-step movement, a manually actuated rotatable operating shaft, an apertured sleeve rotatably mounted on said shaft, an oscillating actuator secured to said sleeve for movement therewith, a movable normally inoperative connector passing through said sleeve and said shaft and extending beyond the peripheries on one side thereof, and a coin-controlled means for operating said connector, said means comprising a reciprocating bar having a cam surface on which the extension of said connector rides to cause engagement thereof with the aperture of said sleeve to form an operative connection therebetween when a coin holds said bar against movement and rotative movement of said shaft is had in one direction, said bar being movable when a coin is not deposited for co-operation therewith to maintain said connector in a normal inoperative condition.

6. In an operating mechanism for imparting a step-by-step movement, a manually actuated rotatable operating shaft, an apertured sleeve rotatably mounted on said shaft, an oscillating actuator secured to said sleeve for movement therewith, a normally inoperative connector movably engaged in an opening in said shaft, a coin-controlled means mounted independently of said shaft and sleeve and having a portion thereof disposed in the path of movement of said connector, said coin-controlled means being normally held against movement in the path of movement of said connector upon reception of a coin therein to move said connector into the aperture of said sleeve thereby forming an operative connection between said sleeve and shaft for initiating operation of said oscillating actuator upon rotation of said shaft in one direction, means on said sleeve and rotatable therewith for holding said connector in its aperture-engaged position during completion of the period of rotation of said shaft in the same direction, and means on said sleeve for operating upon said holding means to discharge said coin at the completion of connected movement of said shaft and sleeve.

7. In an operating mechanism for imparting a step-by-step movement, a manually actuated rotatable operating shaft, a sleeve rotatably mounted on said shaft, an oscillating actuator secured to said sleeve for movement therewith, a movable normally inoperative connector associated with said shaft, a coin-controlled means for moving said connector to cause engagement thereby with said sleeve to form an operative connection therebetween upon reception of a coin and rotative movement of said shaft in one direction, said coin-controlled means comprising a reciprocating bar having a cam on one end thereof for engaging said connector and a pivotal connection on the other end, a bell-crank lever pivotally mounted adjacent said bar having one arm thereof engaging the pivotal connection of said bar, a coin-retaining lever pivotally mounted at one end thereof and co-operating at the free end thereof with the other arm of said bell-crank lever to hold a coin in one position thereof, cam means on said sleeve, and means associated with said cam means for operating said coin-retaining lever to discharge said coin upon a predetermined movement of said sleeve.

8. In an operating mechanism for imparting a step-by-step movement, a manually actuated rotatable operating shaft, a sleeve rotatably mounted on said shaft, an oscillating actuator secured directly on said sleeve for movement therewith, a connector pin mounted to reciprocate diametrically in said shaft, said sleeve having a slot for each end of said connector pin, means normally projecting one end of said connector pin out of engagement with one slot and the other end to extend through the other slot, said last-mentioned slot being of sufficient length to permit relative movement of said shaft and sleeve without constituting an operative connection therebetween, and a coin-controlled means for reciprocating said connector pin into said first-mentioned slot to form an operative connection between said shaft and sleeve upon reception of a coin and rotative movement of said shaft in one direction.

9. In an operating mechanism for imparting a step-by-step movement, a manually actuated rotatable operating shaft, a sleeve rotatably mounted on said shaft, an oscillating actuator secured directly on said sleeve for movement therewith, a connector pin mounted to reciprocate diametrically in said shaft, said sleeve having a slot for each end of said connector pin, resilient means normally projecting one end of said connector pin out of engagement with one slot and the other end to extend through the other slot, said last-mentioned slot being of sufficient length to permit relative movement of said shaft and sleeve without constituting an operative connection therebetween, and a coin-controlled means for reciprocating said connector pin in opposition to said resilient means into said first-mentioned slot to form an operative connection between said shaft and sleeve upon reception of a coin and rotative movement of said shaft in one direction.

10. In an operating mechanism for imparting a step-by-step movement, a manually actuated rotatable operating shaft, a sleeve rotatably mounted on said shaft, an oscillating actuator secured directly on said sleeve for movement therewith, a connector pin mounted to reciprocate diametrically in said shaft, said sleeve having a slot for each end of said connector pin, resilient means normally projecting one end of said connector pin out of engagement with one slot and the other end to extend through the other slot, means for limiting the movement of said connector pin in each direction, said last-mentioned slot being of sufficient length to permit relative movement of said shaft and sleeve without constituting an operative connection therebetween, and a coin-controlled means for reciprocating said connector pin in opposition to said resilient means into said first-mentioned slot to

form an operative connection between said shaft and sleeve upon reception of a coin and rotative movement of said shaft in one direction.

11. In an operating mechanism for imparting a step-by-step movement, a manually actuated rotatable operating shaft, a sleeve rotatably mounted on said shaft, an oscillating actuator secured directly on said sleeve for movement therewith, a connector pin mounted to reciprocate diametrically in said shaft, said sleeve having a slot for each end of said connector pin, means normally projecting one end of said connector pin out of engagement with one slot and the other end to extend through and beyond the other slot, said last-mentioned slot being of sufficient length to permit relative movement of said shaft and sleeve without constituting an operative connection therebetween, and a coin-controlled means for reciprocating said connector pin into said first-mentioned slot to form an operative connection between said shaft and sleeve upon reception of a coin and rotative movement of said shaft in one direction, said means comprising a reciprocating bar having a cam on one end thereof for engaging the extending end of said connector, a coin-retaining lever pivotally mounted at one end thereof and having the other end thereof co-operating with the other end of said reciprocating bar to hold said coin, and means co-operating with said sleeve during movement thereof to operate said coin-retaining lever to discharge said coin.

12. In an operating mechanism for imparting a step-by-step movement, a manually actuated rotatable operating shaft, a sleeve rotatably mounted on said shaft, an oscillating actuator secured directly on said sleeve for movement therewith, a connector pin mounted to reciprocate diametrically in said shaft, said sleeve having a slot for each end of said connector pin, means normally projecting one end of said connector pin out of engagement with one slot and the other end to extend through and beyond the other slot, said last-mentioned slot being of sufficient length to permit relative movement of said shaft and sleeve without constituting an operative connection therebetween, and a coin-controlled means for reciprocating said connector pin into said first-mentioned slot to form an operative connection between said shaft and sleeve upon reception of a coin and rotative movement of said shaft in one direction, said means including a reciprocal bar having a cam on one end thereof for engaging the extending portion of said connector pin, a segment mounted on said sleeve and having an angularly extending foot forming an extension of said cam for holding said connector pin in operative connection during movement of said sleeve and shaft to complete a cycle of movement thereof.

13. In an operating mechanism for imparting a step-by-step movement, a manually actuated rotatable operating shaft, a sleeve rotatably mounted on said shaft, an oscillating actuator secured directly on said sleeve for movement therewith, a connector pin mounted to reciprocate diametrically in said shaft, said sleeve having a slot for each end of said connector pin, means normally projecting one end of said connector pin out of engagement with one slot and the other end to extend through and beyond the other slot, said last-mentioned slot being of sufficient length to permit relative movement of said shaft and sleeve without constituting an operative connection therebetween, a coin-controlled means for reciprocating said connector pin into said first-mentioned slot to form an operative connection between said shaft and sleeve upon reception of a coin and rotative movement of said shaft in one direction, said means comprising a reciprocating bar having a cam on one end thereof for engaging the extending end of said connector pin, a coin-retaining lever having pivotally connected sections resiliently held against pivotal movement, said lever being pivotally connected at one end and having the other end thereof co-operating with the other end of said reciprocating bar to hold a coin, and means co-operating with said sleeve during movement thereof to operate said coin-retaining lever to discharge said coin, said resiliently held sections being operable to pivot relative to each other to prevent jamming of said coin.

14. In an operating mechanism for imparting a step-by-step movement, a manually actuated rotatable operating shaft, a sleeve rotatably mounted on said shaft, an oscillating actuator secured directly on said sleeve for movement therewith, a connector pin mounted to reciprocate diametrically in said shaft, said sleeve having a slot for each end of said connector pin, means normally projecting one end of said connector pin out of engagement with one slot and the other end to extend through the other slot, said last-mentioned slot being of sufficient length to permit relative movement of said shaft and sleeve without constituting an operative connection therebetween, a coin-controlled means for reciprocating said connector pin, a coin chute for directing a coin to said coin-controlled means, said connector pin being moved into said first-mentioned slot to form an operative connection between said shaft and sleeve upon reception of a coin and rotative movement of said shaft in one direction, means operated by said sleeve to operate said coin-controlled means to discharge said coin from said coin-controlled means, and means for intercepting said coin from said coin chute to by-pass said coin-controlled means, after a predetermined number of operations of said operating mechanism.

ROY LANE TRIMBLE.