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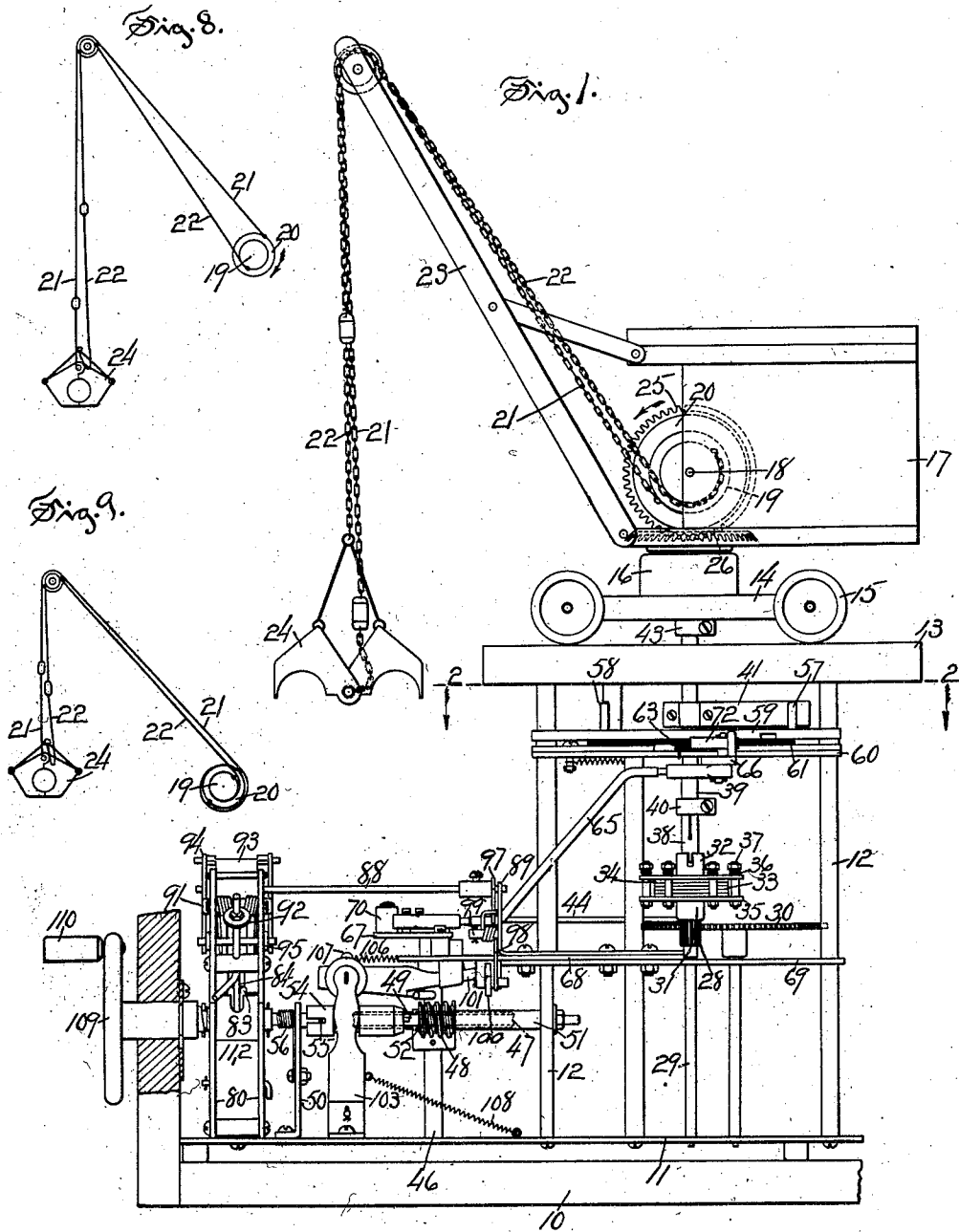
L. MAASS

1,860,509

VENDING MACHINE

Filed Feb. 24, 1926

4 Sheets-Sheet 1



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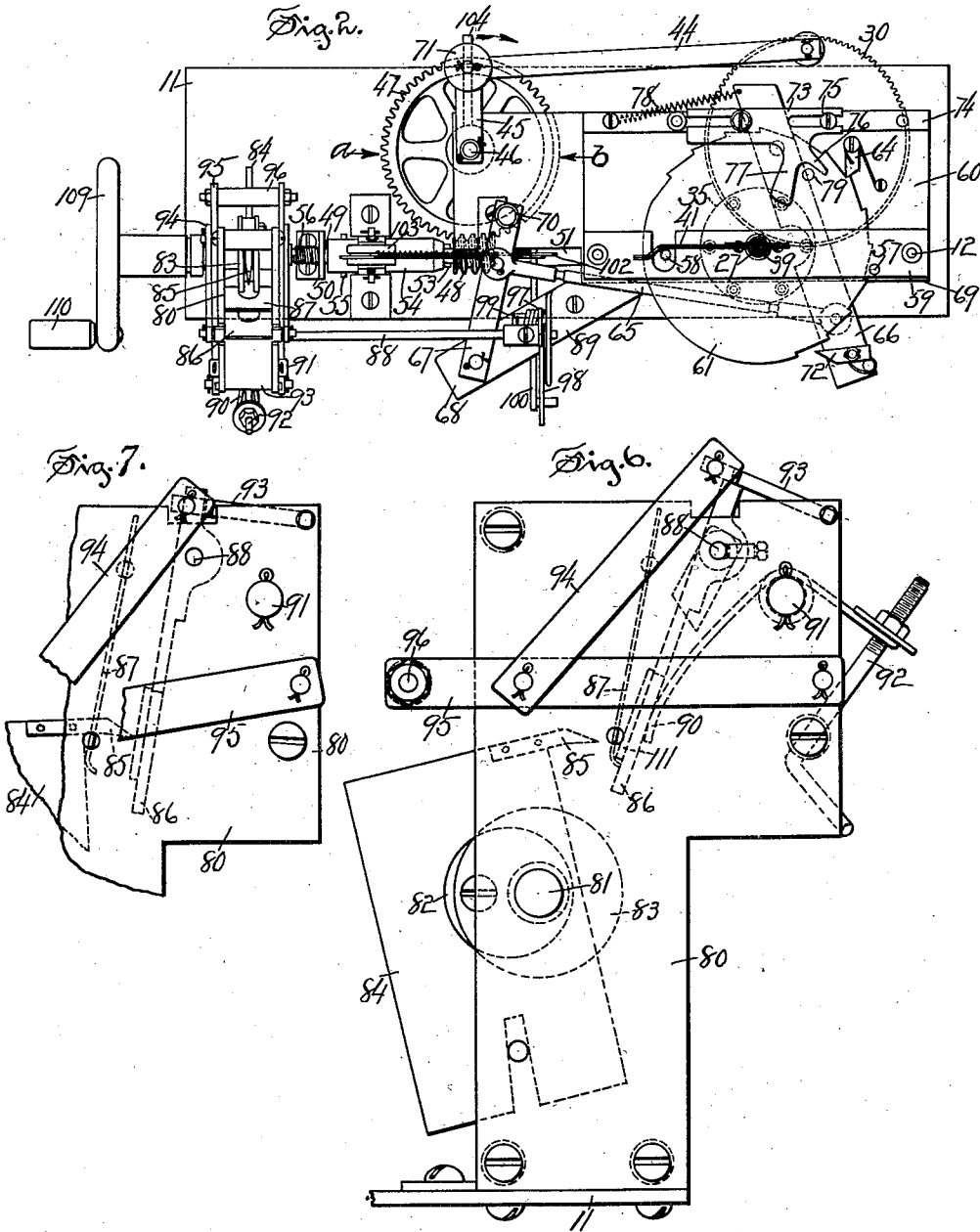
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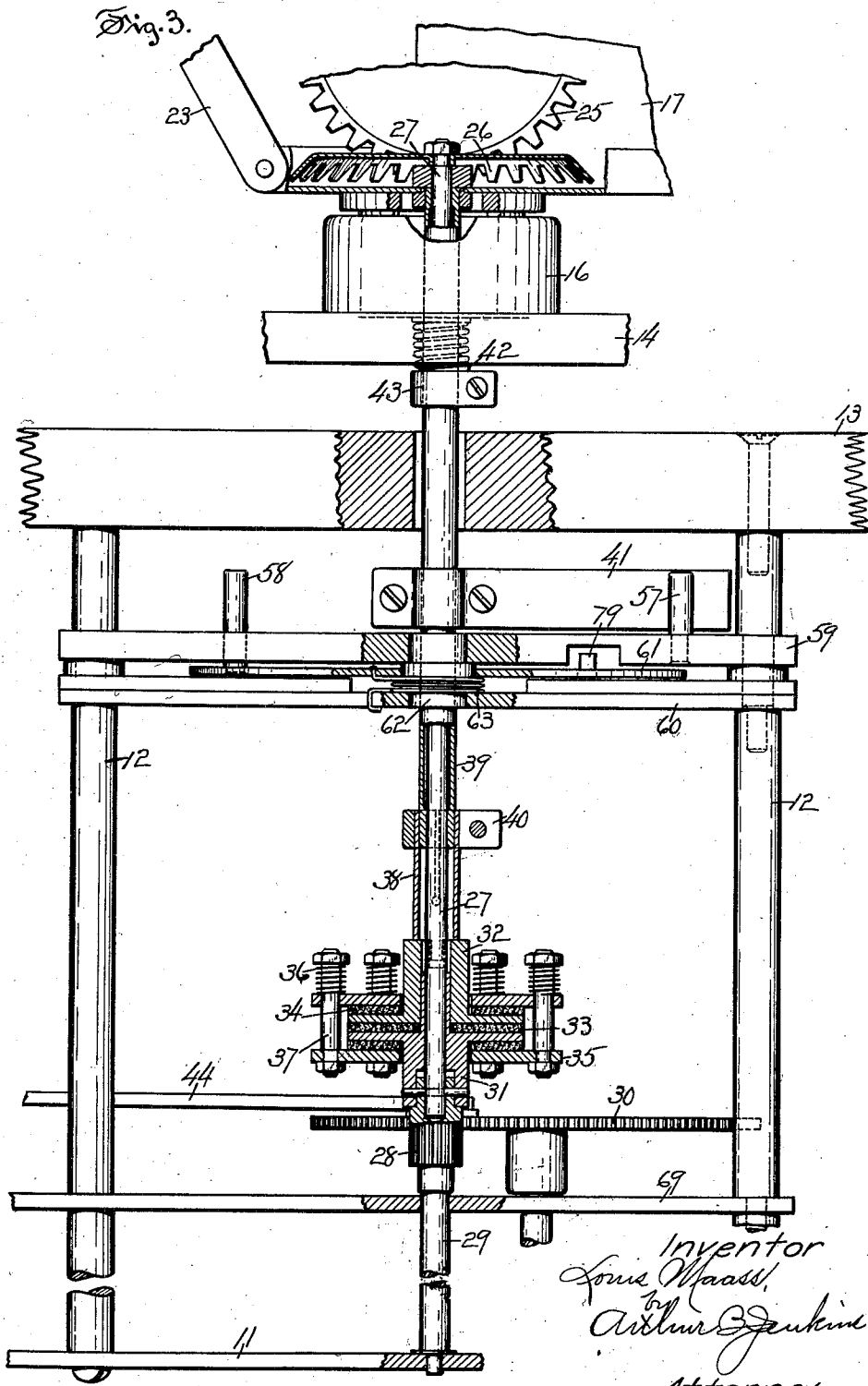
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4 Sheets-Sheet 3



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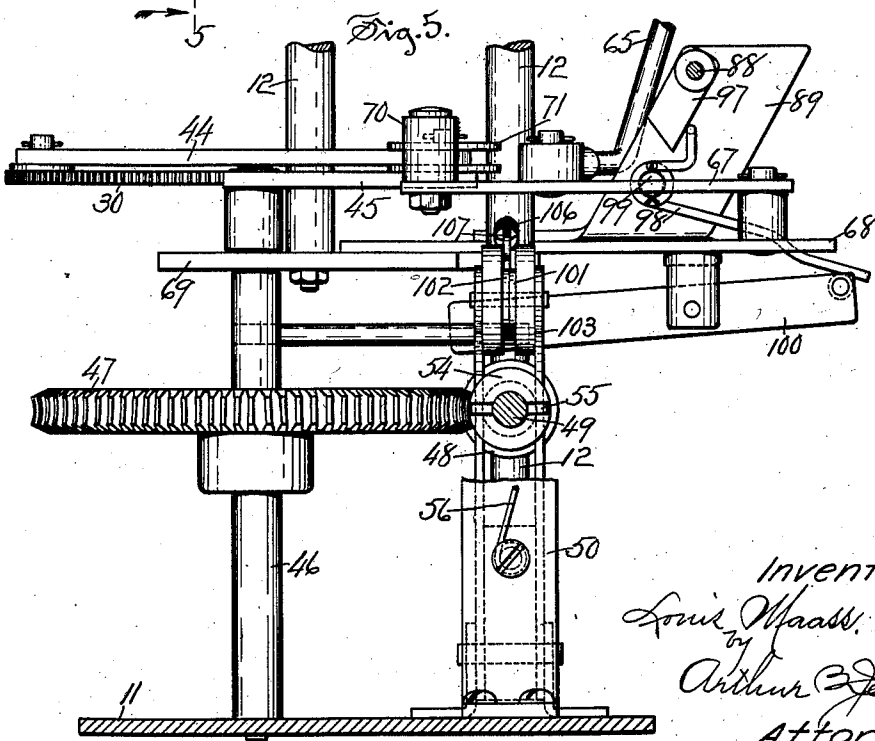
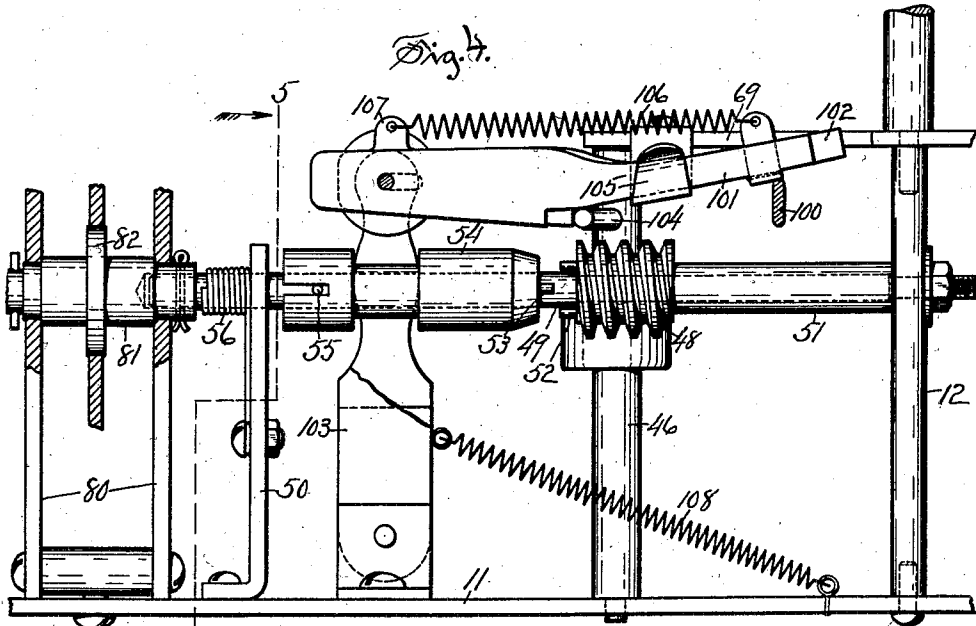
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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VENDING MACHINE

Application filed February 24, 1926. Serial No. 90,291.

My invention relates to the class of vending machines, the operation of the mechanism in which may be controlled by a coin or token and which machine is adapted more especially for the vending of confectionery or similar commodities, and an object of my invention, among others, is the production of an apparatus of this class in which the material to be vended is handled in a novel and unique manner to stimulate an interest and curiosity with respect to the working of the mechanism.

One form of apparatus embodying my invention and in the construction and use of which the objects herein set out, as well as others, may be attained, is illustrated in the accompanying drawings, in which—

Figure 1 is a view in side elevation of my improved apparatus with most of the case omitted.

Figure 2 is a plan view of the same with all of the case omitted, and on section denoted by the dotted line 2—2 of Figure 1, the parts, however, being in the position at the time the bucket is filled.

Figure 3 is a view, scale enlarged, in elevation of a portion of the mechanism with parts broken away to show construction, and with some of the parts omitted.

Figure 4 is a view, scale enlarged, in side elevation of another portion of the mechanism.

Figure 5 is a view in section on a plane denoted by the dotted line 5—5 of Figure 4, with parts omitted.

Figure 6 is a view, scale enlarged, illustrating the operation of the coin mechanism, the parts being in one position.

Figure 7 is a view of a portion of the mechanism shown in Figure 6, but with the mechanism in another position.

Figure 8 is a diagrammatic view of a portion of the hoisting mechanism illustrating its operation, with the bucket in a different position from that shown in Figure 1.

Figure 9 is a similar view, but showing the bucket in still another position.

In the arrangement shown herein the mechanism is inclosed in a case 10, only a portion however of which is shown, and

which may comprise a base portion that may be constructed of wood or other suitable material, a display portion, of glass or similar material, and a top of wood or other suitable material, which case may be of any desired form and provided with a coin chute to conduct coins to coin mechanism to be hereinafter described. This case may also be provided with a delivery receptacle in which candy or other desired material is deposited and from which it may pass by gravity to a receiver on the outside of the case, and from which the material may be readily obtained in a manner common to devices of this class. This material is contained in a bin within the case and from which it is taken by a bucket, which bucket is lowered into the bin where it closes to collect the material, is then raised and swung to one side and then again lowered and opened to deposit the material in the receptacle above described in a manner to be hereinafter set forth.

A base plate 11 is located in the bottom of the case and upon which the mechanism is mounted, this mechanism including supporting columns denoted generally by the numeral 12, which are secured to and rise from said base plate, these columns being in sections secured together by interengaging threaded parts and between which supporting plates to be hereinafter described are located.

A hoisting mechanism bed 13 is secured to the top of the columns 12, as by means of screws, and a hoisting mechanism is supported on this bed. This mechanism comprises a base 14 that may be supported on wheels 15, which wheels are principally for appearance and perform little function in the operation of the mechanism. A shell 16 is secured to the base 14 and has in its upper surface a ball race for a set of ball bearings, a house 17 being seated upon the ball bearings and having a hoisting shaft 18 mounted in bearings in its sides, and supporting hoisting drums 19—20 of different diameters and around which hoisting chains or cables 21—22 are wrapped, said cables extending over sheaves at the end of a boom 23 and downwardly to a bucket 24 of the common clam-

shell type of construction and comprising two members pivotally united and adapted to be closed and opened, the cables 21 and 22 being secured to the bucket parts and to the drums 19 and 20 in a manner to cause the bucket in its vertical movements to open and close at such times and places as may be desired and as hereinafter set forth.

At the end of a cycle of operations of the machine the bucket is in an open condition, as shown in Figure 1, the bucket members having opened for the discharge of its contents, and in a position slightly raised from that at which the discharge took place. It will be noted that in this position the point of attachment of the cable 21 to the larger drum 20 is so located that rotation of the drum in the direction indicated by the arrow in Figure 1 will cause the cable to be wound upon the drum, as well as the cable 22, which latter at this time supports and lifts the bucket. In a continuance of the operation, effected by rotation of the drums 19—20 in a manner to be hereinafter described, the two cables 21—22 will be wound upon the drum, the cable 21 at this time being slack. However, when the bucket is lifted a little above the position shown in Figure 1 the lifting movement ceases by action of mechanism to be hereinafter described, and the house 17 is swung on its pivot to locate the bucket over a bin (not shown) in which the material to be vended is stored. During this part of the operation the bucket is supported by the cable 22. In a continuance of the operation from this point the drums 19—20 again begin to rotate, but in a direction opposite to that before described and indicated by the arrow in Figure 1, and the cables are unwound from the drums. When the point of attachment of the cable 21 to the drum 20 passes a point at which said cable extends radially with respect to the drum, that is, where said cable is not wrapped about the drum at all, which point I term herein the "dead-center" point, this cable 21 is again wound upon the drum but in an opposite direction to that before described, while the cable 22, that supports the bucket, continues to unwind and the bucket is lowered. This relative arrangement of the cables upon the drums, however, during the lowering of the bucket causes the slack in the cable 21 to be rapidly taken up and to be removed at about the time the bucket reaches the mass of material in the bin and the cable 22 becomes slack and the weight of the bucket is now sustained by the cable 21. The slackening of the cable 22 permits the bucket to close into the mass of material in a manner that will be readily understood and as illustrated in Figure 8 of the drawings. The bucket is thus closed and filled with the material just before the time the point of attachment of the cable 22 to the drum reaches the "dead-center". The

drums continue in their rotation, the bucket is lifted by the cable 21 and the cable 22 continues to slacken until after its point of attachment passes the "dead-center" after which said cable 22 begins to wind upon the drum. This cable, however, remains slack for the reason that being wound upon the drum of smallest diameter it does not wind so fast as the cable 21.

The cable 21 continues to lift the bucket until the parts are about in the position shown in Figure 9, when the mechanism automatically stops rotation of the drums and the house 17 is swung back to the position shown in Figure 1. Rotation of the drum now again automatically begins in the direction indicated by the arrow in Figure 1, with a result that the cable 21 supporting the bucket is, together with the cable 22, unwound and the bucket is lowered. In this lowering operation the cable 22 remains slack until after it passes the "dead-center" point when it begins to wind upon the drum while the cable 21 is still unwinding. This causes the slack in the cable 22 to be taken up until the weight of the bucket is sustained by the cable 22 after which the weight of the bucket suspended from the cable 22 will cause said bucket to be opened, as shown in Figure 1, and the material will be dropped into a proper receptacle (not shown) for delivery to the purchaser. At this time parts of the mechanism are automatically disconnected and the operation ceases and can only be repeated upon the deposit of a coin or token in a manner to be hereinafter described, when coin controlled mechanism is employed in the machine.

The mechanism for operating the hoisting mechanism just described comprises a bevel gear 25 secured to the shaft 18 and meshing with a bevel gear 26 secured to the upper end of a cable operating shaft 27 that has a pinion 28 secured to its lower end, said pinion having a shank 29 affording a stepped bearing in the base plate 11. This pinion is driven by an intermeshing gear 30 that is rotated in a manner to be hereinafter described.

A clutch member 31 is secured to the lower end of the shaft 27 and is frictionally connected with the other clutch member 32 by means of a friction disc 33. In the construction herein shown each clutch member has a flange on the outsides of which friction discs 34 are located, with friction plates 35 disposed outside of the discs 34, said discs, plates and flanges being pressed into contact by springs 36 mounted upon posts 37, said posts being secured to one of said plates and extending through the other plate, and said springs being located outside of one of said plates, as shown in Figure 3.

The clutch member 32 is secured to the lower end of a sectional tubular shaft comprising a lower section 38 and an upper section

39 secured together by a coupling 40, one of said shaft sections being split to enable it to tightly engage the other shaft section. The upper shaft section 39 is secured at its upper end to the house 17 and serves as a means for rotating said house, the shaft 27 within this tubular shaft rotating independently thereof to operate the hoisting mechanism when said tubular shaft is held against rotation as by means of a holding arm 41 clamped to said tubular shaft. In order to keep the gears 25 and 26 properly meshed a spring 42 seated upon a collar 43 and thrusting at its upper end against the bottom of the shell 16 may be employed, the spring thus exerting an upward thrust against the gear 26.

The gear 30 has an oscillating movement imparted to it by a connecting rod 44 pivotally attached at one end to the gear and at its opposite end to the outer end of an arm 45 secured at its inner end to a shaft 46 having a worm wheel 47 driven by an intermeshing worm 48 mounted to rotate freely upon a shaft 49. This latter shaft is rotatably mounted at one end in one of the posts 12 and at its opposite end extends into the hub of an eccentric to be hereinafter described mounted in a bracket 50 secured to and rising from the base plate 11 and as shown in Figures 2 and 4 of the drawings. A spacer 51 on the shaft 49 takes the thrust of the worm 48 in one direction.

The worm 48 has pin clutch members 52 arranged for engagement with pin clutch members 53 projecting from a sliding clutch member 54 splined to the shaft 49 as by means of a pin 55 projecting from said shaft into a slot in the end of the clutch member, and as shown in Figure 4 of the drawings. A detent is employed to prevent backward rotating movement of the shaft 49, in the construction herein shown this detent being in the form of a coiled spring 56 wrapped about the shaft and having one end secured to the bracket 50. This spring is so wrapped about the shaft that if an attempt be made to rotate the latter backwardly the spring will contract and tightly grip the shaft in a manner that will be readily understood and thus prevent its backward rotation.

In order to determine the position of the house 17, and hence of the bucket 24, when receiving and when delivering material, the following mechanism is employed: When delivering, the bucket may well be located in the same angular position each time it discharges its load, but it is desirable that the bucket receive its load in different angular positions. To this end, a fixed stop pin 57 is employed to determine the delivery position of the bucket, and a movable stop pin 58 is employed to determine the position of the bucket in receiving its load. The pin 57 is secured to a bar 59 supported by two of the columns 12, and spaced from a support-

ing plate 60 also mounted on the columns 12. The pin 58 is secured to and projects from a positioning disc 61 mounted to rotate freely on a bushing 62 secured to the bar 59 and plate 60, as shown in Figure 3 of the drawings. This disc 61 is forced in one direction by a spring 63 secured at one end to the disc and at its opposite end to the plate 60. A spring pressed detent 64 in engagement with teeth on the periphery of the disc 61 holds said disc from rotation under tension of the spring 63 when said disc has been moved to an advanced position.

The arm 45 makes a complete rotation at each cycle of movement of the machine, and this imparts one complete reciprocating movement, that is, a movement forward and back, to the gear 30 at each cycle of movement of the machine, which reciprocating movement effects swinging as well as vertical movement of the bucket 24.

The positioning disc 61 is actuated by a positioning rod 65 pivotally attached at one end to a pivotally mounted positioning bar 66 and at its opposite end to a bucket positioning actuator 67 pivotally mounted at one end on a support 68 secured to and projecting from a table 69 supported by the columns 12, and as shown in Figures 1 and 2 of the drawings. The end of said actuator opposite its pivot has a contact roller 70 adapted to be struck by an actuating roller 71 on the end of the arm 45. A spring pressed pawl 72 is mounted on the positioning bar 66 for engagement with the teeth on the edge of the positioning disc 61 to impart a step by step forward movement to said disc.

A resetting trip slide 73 is mounted for sliding movement on a strip 74 secured at one edge of the plate 60, and as shown in Figure 2 of the drawings, said slide being guided in its movements by guide pins 75 projecting from said strip through slots in the slide. This slide has a trip finger 76 to engage the detent 64 and disengage the latter from the teeth on the edge of the disc 61, the slide 73 being located just above said disc and the detent extending above the plane of the disc to enable the parts to engage as described.

The slide 73 has an actuating arm 77 adapted to be engaged by the stop pin 58 in the step-by-step movement of the disc 61 at the end of such movement, whereby the slide 73 is intermittently pushed forward until the finger 76 encounters the detent 64 and moves it away from the teeth on the disc 61, at the time of this final movement of the slide 73 the disc 61 being moved by the pawl 72 and the detent 64 therefore not being in engagement with said teeth is free to be moved as described. This forward movement of the disc at this time is caused by the bar 66 actuated by the rod 65 and actuator 67 by reason of engagement of the roller 70 with the roller

71. Just as soon as the roller 71 passes the roller 70 the parts just described are free to return to their former positions under the pull of a spring 78 secured at one end to the strip 74 and at its opposite end to the bar 66. This movement positions the pawl 72 for engagement with the next tooth back of that on the disc 61 engaged in the previous movement of said disc, backward movement of the disc during this return movement of the pawl 72 being prevented by the pawl 64, and a step-by-step movement is thus imparted to the disc. The disc 61 has a certain number of step-by-step movements and the pin 58 thereon is gradually advanced until at the end of said certain number of step-by-step movements said pin encounters the arm 77 and moves the slide 73 to engage the finger 16 with the detent 64 and disengage said detent from the teeth on the disc 61 and the latter, therefore, returns to its initial position under the influence of the spring 63 and for a repetition of its step-by-step movement. At the completion of this returning movement of the disc 61 a slide returning pin 79 on the disc 61 engages the arm 77 and moves the slide 73 to its initial or starting position and as illustrated in Figure 2 of the drawings.

Power to operate the machine may be applied to the shaft 49 in any desired manner, and while coin operated mechanism is shown herein for controlling the movements of said shaft, it will be understood that the invention is not confined to such a means of control.

The operation of the machine thus far described is as follows:

If the coin controlled mechanism be omitted the clutch member 54 will be moved into position to engage the clutch pins 52—53 and power now being applied to the end of the shaft 49 the worm 48 will be rotated. Let it be assumed that the operation will be from the beginning of a cycle of movement of the machine, in which the parts will be in the positions substantially as shown in Figure 1, in which position the arm 45 in Figure 2 will be located in a position 180° from that shown, the actuator 67 at this time being swung to the left and the rollers 70 and 71 being just at the point of disengagement. Just after the worm 48 begins to rotate the rollers 70—71 will be released and the actuator 67, rod 65, bar 66, and supported parts will be moved to the position shown in Figure 2. Before release of the rollers 70 and 71 the arm 41 will be in contact with the fixed stop pin 57.

The shaft 49 continuing to rotate the arm 45 will be swung from the position described to a position about 90° to the left of that shown in Figure 2, and indicated by the letter *a*, and during this movement the connecting rod 44 will operate to swing the gear 30 counterclockwise, this rotating the pinion 28 and the shaft 27, the clutches connecting the

shaft 39 and 27 slipping at this time by reason of the fact that the holding arm 41 is engaged with the fixed stop pin 57. This action operates to slightly raise the bucket in a manner as hereinbefore described.

Rotation of the shaft 49 continuing, the arm 45 moves from the position indicated in a clockwise direction to the position shown in Figure 2. This through the connecting rod 44 reverses the movement of the gear 30 and the parts, including the shafts 27 and 39, connected therewith, and the holding arm 41 is, therefore, rotated away from the fixed stop pin 57 toward the movable stop pin 58, and there being no resistance to movement of the shaft 39 the house 17 is rotated until the stop 41 engages the movable stop pin 58, the bucket now being located over the bin containing the material. This movement takes place during the first part of the movement of the arm 45 from the position *a*, and during the completion of the movement to the position shown in Figure 2, the shaft 39 being held against movement by the arm 41, the shaft 27 operates to lower the bucket in the manner hereinbefore described and to close it in the mass of material in the bin. A continuation of the operation and rotation of the shaft 49 in the direction described moves the arm 45 from the position shown in Figure 2 to a position about 90° therefrom and indicated by the letter *b*, this movement continuing the rotation of the shaft 27 thereby lifting the closed bucket with the material therein to its raised position. After passing the point *b* the arm 45 through the rod 44 reverses movement of the gear 30 and parts connected therewith including the arm 41 and the latter is swung into engagement with the fixed stop pin 57, this movement also swinging the house and bucket in the opposite direction to that hereinbefore described and to the end of its path of movement where the bucket is located over its delivery position. This takes place during the first part of the movement of the arm 45 from the point *b* and as soon as the arm 41 engages the stop pin 57 the continued movement of the arm 45, gear 30 and connected parts operates the shaft 27 alone whereby the hoisting mechanism is operated as hereinbefore described to lower the bucket to its delivery position and to open it for discharge of the material therein, this completing one cycle of movement of the machine.

As hereinbefore mentioned the bucket 24 takes its load from a different part of the bin from that at which it took its preceding load, this position being determined by contact of the arm 41 with the movable stop pin 58, and the latter having its position changed at each cycle of operation of the machine, said pin being shown at one end of its path of movement in Figures 1 and 2. As hereinbefore stated the roller 71 engages the roller

70 just before the completion of a cycle of movement, the actuator 67 having received part of its movement at the completion of the cycle of movement of the machine, and this operation moves the pawl 72 from the position shown in Figure 2 into engagement with the next tooth on the disc 61, and also giving to the disc 61 part of its one step movement. At the beginning of the next cycle of movement of the machine the actuator 67 completes its movement, thus effecting a completion of the one step movement of the disc 61, and the movable stop pin is thereby advanced to the next position which is a distance equal to the length of each of the teeth of the disc 61. Just after this operation takes place the roller 71 passes the roller 70 and releases the latter, and the positioning bar 66 is permitted to return to its initial position, as shown in Figure 2, under the impulse of the spring 78. This movement of the bar 66 also effects movement of the actuator 67 to its initial position, and as shown in Figure 2 of the drawings. It will thus be seen that the arm 41 swings a less distance at each cycle of movement of the machine than at that of the preceding movement, and likewise the bucket is swung a less distance at each succeeding movement, and consequently is located in a different position each time it takes a load. When, however, the pin 58 reaches the arm 77 and thereby moves the slide 73 the parts will be tripped and returned to their initial position in the manner hereinbefore described.

If it be desired to control the operation of the machine thru the deposit of a coin or token I have provided mechanism as follows for accomplishing this purpose: This mechanism comprises two supporting plates 80 secured to and rising from the base plate 11 and a hub 81 of an eccentric 82 is mounted for rotation in these parts, and as shown in Figure 4. The end of the shaft 49 is extended into a recess in said hub and is secured thereto to be rotated thereby. Retaining discs 83 are secured to the shaft on opposite sides of the eccentric 82 to support on said eccentric a feeler actuator 84 having a slot engaged by a guide pin at its lower end and having a finger 85 at its upper end adapted to pass through slots in the lower ends of a coin supporting plate 86 and a coin retaining plate 87, the latter being secured between the side plates 80 and having a coin retaining lip at its lower end, and the former being secured at its upper end to a clutch releasing shaft 88 mounted for oscillating movement in one of the plates 80 and in a bracket 89 secured to and rising from the support 68. The coin supporting plate 86 is forced toward the coin retaining plate 87 by a two armed spring 90 coiled about a spring support 91 secured to and between the plates 80, the bowed outer end of said spring being engaged by a thread-

ed spring retainer 92 held at its lower end by a support secured between the side plates 80 and as shown in Figure 6.

A coin plate holder 93 is pivotally supported at one end between the plates 80, its opposite end being adapted to engage behind the upper end of the coin supporting plate 86 and holding the lower end of the latter spaced from the plate 87, as shown in dotted lines in Figure 7 of the drawings. This holder 93 is actuated by bars 94 pivotally attached to the outer end of the holder and extending on opposite sides of the plates 80 to a holder actuating frame comprising side bars 95 each pivotally attached at one end to a plate 80 and joined at their opposite ends by a rod 96 adapted to be engaged by the upper edge of the actuator 84 and to be thereby raised to disengage the holder 93 from the plate 86 and permit the latter to swing forward under the impulse of the spring 90.

A clutch releasing finger 97 is secured to the shaft 88 and engages one arm of a bell crank lever 98 in the form of a spring coiled about a stud 99 projecting from the side of the bracket 89, the other arm of said lever engaging a stud projecting from the side of a clutch releasing lever 100 pivotally supported on a stud projecting from the under side of the support 68, and as shown in Figure 5.

The lever 100 engages the under side of a clutch holding lever composed of two members 101—102 both pivotally attached at one end to a clutch actuating lever 103, and the member 102 having a slot to receive the pivot on the lever 103 whereby the member 102 has an endwise movement independently of said lever. Both of these lever members have shoulders for engagement of a clutch releasing pin 104 projecting from the shaft 46 to engage the shoulders of said members. A lever rest 105 is secured to and projects from the plate or table 69 to limit downward movement of the clutch holding lever, and a spring 106 forces the member 102 to its extended position, as shown in Figure 4 by a pulling force upon a projection 107 from the member 102. The clutch actuating lever 103 is pivotally attached at its lower end to the base plate 11 and is forced in a direction to engage the clutch pins 52 and 53 by a clutch engaging spring 108, this lever 103 being forked to engage on opposite sides of a reduced portion of the clutch member 54 whereby said member is moved in opposite directions by said lever, and as shown in Figure 4 of the drawings. The hub 81 is connected with the hub of a hand wheel 109, having a handle 110, by a pin and cam connection of ordinary construction whereby rotation of the wheel 109 in the proper direction will cause rotation of the hub 81, but rotation of said wheel in the opposite direction will disengage the connecting members and will not effect rotation of the hub 81.

In the operation of the coin actuated part of the mechanism, a coin or token 111 is inserted in a coin chute (not shown) extending from outside of the case in any ordinary manner to direct said coin or token into the space between the plates 86 and 87, and rotation of the hand wheel 109 in the proper direction will cause rotation of the hub 81 and the eccentric 82 whereby the actuator 84 will be lifted and swung forward at its upper end, causing the finger 85 to engage the coin or token 111. Should this be in the form of a washer the finger will pass through the hole therein and further operation will cease. If a proper coin or token be used the finger will engage such and the plate 86 will be swung away from the plate 87, the coin up to this time being supported on the lip at the lower end of the plate 87. This movement of the plate 86 against the tension of the spring 90 will release the holder 93 that will move from the position shown in Figure 6 to the position shown in Figure 7, thus retaining the plate 86 in the position shown in Figure 7. This movement of the plate 86 also rocks the shaft 88 causing the finger 97 to rock the bell crank 98, thereby actuating the lever 100 to raise the members 101—102 and disengage them from the pin 104. This permits the spring 108 to actuate the lever 103 to engage the clutch pins 52—53 and start rotation of the worm 48 and the mechanism operated thereby, which mechanism will continue to operate by a continued rotation of the hand wheel 109 until the pin 104, that has been disengaged by the raising of the members 101—102 again engages the shoulder on said member 102, causing the latter to be independently moved back and increasing the tension of the spring 106, one end of which is secured to the member 101. Continued movement of the pin 104 engages it with the shoulder on the member 101, moving the latter and consequently the lever 103, thereby disengaging the pins 52—53 and stopping the machine. The spring 106 exerting a greater force on the lever 103 than does the spring 108, and the member 102 being held by the pin 104 the spring 106 will now, after the pins 52—53 are disengaged, pull the member 101 further back independently of the member 102 and to the position shown in Figure 4, thereby separating the pins 52—53 so that they will not strike at the beginning of the operation of the machine when it is again started up. During preliminary operation of the apparatus and while the plate 86 is being retained by the holder 93 the actuator 84 in its upward movement will strike the rod 96, thereby moving the bars 95 and 94 upward to disengage the holder 93 from the blade 86, and the latter will, therefore, move to its initial position under the influence of the spring 90, and as shown in Figure 6. This movement will rock the shaft 88 and remove

the pressure of the bell crank 98 from the lever 100, thereby permitting the members 101—102 to drop into position for engagement by the pin 104, as hereinbefore described.

An apron 112 is secured between the plates 80 at the lower end thereof to direct a coin into a proper receptacle after its release by the plate 86.

It is observed that applicant's device may well operate without including the coin actuated mechanism and yet embody all of the material features hereinbefore described. This may be accomplished in several ways. As an example, the opening in the coin supporting plate 68 for the passage of the finger 85 may be omitted, in which case the finger 85 would strike the plate in each reciprocating movement of said finger and the mechanism would operate in the same manner as hereinbefore described with the employment of a coin. With such operation the device will be found highly efficient for amusement purposes in determining whether or not the bucket will or will not pick up material in certain locations in the bin in which said material is located.

In accordance with the provisions of the patent statutes I have described the principles of operation of my invention, together with the device which I now consider to represent the best embodiment thereof; but I desire to have it understood that the device shown is only illustrative and that the invention may be carried out by other means and applied to uses other than those above set out.

While my invention is illustrated and described herein with particular reference to an amusement device or vending machine, as it is particularly adapted for use in connection with such device, yet I have no intention of limiting the invention to use in such device, as there are many elements of the structure which will be found of advantage when used in connection with apparatus for handling loads, and it is my intention that the claims herein shall be considered as covering apparatus or elements thereof when used in full sized apparatus for handling loads.

I claim—

1. In an amusement device a pivotally mounted support, a hoisting shaft mounted in the support and having a drum to receive cables with an attached bucket, a support positioning shaft secured to said support, a cable operating shaft extending through said positioning shaft and connected with said hoisting shaft to rotate it, means for imparting oscillating movement to the cable operating shaft, friction means connecting said operating and positioning shafts for simultaneous movement to position said support, said connection being arranged to permit independent rotation of said hoisting shaft, an arm secured to and projecting from

said positioning shaft, and means to engage said arm to limit its swinging movement in opposite directions.

2. In an amusement device a pivotally mounted support, a hoisting shaft mounted in the support and having a drum to receive cables with an attached bucket, a support positioning shaft secured to said support, a cable operating shaft projecting through said positioning shaft and connected with said hoisting shaft to operate it, a frictional connection between said support positioning and cable operating shafts and including a driving member secured to said cable operating shaft, means for oscillating said driving member, an arm secured to and projecting from said support positioning shaft, and means for limiting the movement of said arm in opposite directions.

3. In an amusement device a pivotally mounted support, a hoisting shaft mounted in the support and having a drum to receive cables with an attached bucket, a cable operating shaft, a support positioning shaft, frictional means connecting said shafts for simultaneous rotation to position said support and to permit independent rotation of said hoisting shaft, means for imparting oscillating movement to said cable operating shaft, an arm secured to and projecting from support positioning shaft, means for limiting movement of said arm in one direction, and means movably mounted for limiting the movement of said arm in another direction.

4. In an amusement device a pivotally mounted support, a hoisting shaft mounted in the support and having a drum to receive cables with an attached bucket, a support positioning shaft secured to said support, a cable operating shaft extending out at the end of positioning shaft, a frictional connection between said support positioning and cable operating shafts, means for imparting oscillating movements to said last mentioned shaft, an arm secured to and projecting from said positioning shaft, a stop mounted in a fixed position to limit movement of the arm in one direction, and a movably mounted stop to limit movement of the arm in another direction.

5. In an amusement device a pivotally mounted support, a hoisting shaft mounted in the support and having a drum to receive cables with an attached bucket, a cable operating shaft and a support positioning shaft, the latter secured to said support, a frictional connection between said support positioning and cable operating shafts, an arm secured to and projecting from said positioning shaft, a fixed stop to limit movement of said arm in one direction, a positioning member, a stop mounted on said positioning member, and means for operating said member to place said stop in different positions.

6. In an amusement device a pivotally

mounted support, a hoisting shaft mounted in said support and having a drum to receive cables with an attached bucket, a cable operating shaft and a support positioning shaft mounted one within the other, means for imparting oscillating movement to said operating shaft, means for frictionally connecting said operating and positioning shafts, an arm secured to and projecting from said positioning shaft, a fixed stop for limiting the movement of said arm in one direction, a positioning member, a stop mounted on said positioning member, and means for imparting a one step movement to said positioning member at each oscillating movement (forward and back) of said shafts.

7. In an amusement device a pivotally mounted support, a hoisting shaft mounted in the support and having a drum to receive cables with an attached bucket, a cable operating shaft and support positioning shaft, one mounted within the other, means for frictionally connecting said two last mentioned shafts, a shaft operating member mounted for oscillating movement and connected to said operating shaft, an actuating member mounted for rotation to impart oscillating movement to said oscillating member, an arm secured to and projecting from said positioning shaft, a fixed stop to limit movement of said arm in one direction, a positioning member, a stop mounted on said positioning member in the path of said arm, and a connection between said actuating member and said positioning member to impart a one step movement to the latter at each complete rotation of the former.

8. In an amusement device a pivotally mounted support, a hoisting shaft mounted in the support and having a drum to receive cables with an attached bucket, a cable operating shaft and a support positioning shaft located one within the other, means frictionally connecting said two last mentioned shafts, an oscillating member connected to said operating shaft, an actuator rotatably mounted and connected with said oscillating member to impart a complete oscillating movement thereto in each rotation of the actuator, an arm secured to and projecting from said positioning shaft, a fixed stop to limit movement of said arm in one direction, a positioning member, a stop located on said positioning member to stop rotation of said arm in an opposite direction, a pivotally mounted bar connected with said positioning member to impart step by step movement thereto, and means on said bar to be engaged by a member on said actuator to operate said bar at each rotation of the actuator.

9. In an amusement device a pivotally mounted support, a hoisting shaft mounted in the support and having a drum to receive cables with an attached bucket, a cable oper-

ating shaft, a support positioning shaft, means frictionally connecting said two last mentioned shafts, an arm secured to and projecting from said positioning shaft, a
5 fixed stop to limit movement of said arm in one direction, a positioning member, a stop mounted on said positioning member to limit movement of said arm in an opposite direction, means for imparting a step by step forward
10 movement to said member, means for imparting a reverse movement to said member, a detent to prevent backward movement of said member, and means actuated by said member to operate said detent to release the
15 member and permit its backward movement.

10. In an amusement device a pivotally mounted support, a hoisting shaft mounted in the support and having a drum to receive cables with an attached bucket, a cable operating shaft and a support positioning shaft, means for frictionally connecting said
20 two last mentioned shafts, an arm secured to and projecting from said positioning shaft, a fixed stop for limiting movement of said arm in one direction, a positioning member, a stop on said member to limit movement of said arm in an opposite direction, means for imparting a step by step forward
25 movement to said member, means for imparting a returning movement thereto, a detent to hold said member against return movement, a releasing member, means on said positioning member to actuate said releasing member to operate said detent to permit return movement of said positioning member, and means for moving said positioning member to operate said actuating member to return it to its initial position.

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