June 4, 1935. C. R. DUMBLE 2,003,349

DISPENSING AND GAME PLAYING MACHINE

Filed Nov. 25, 1933 7 Sheets-Sheet 1

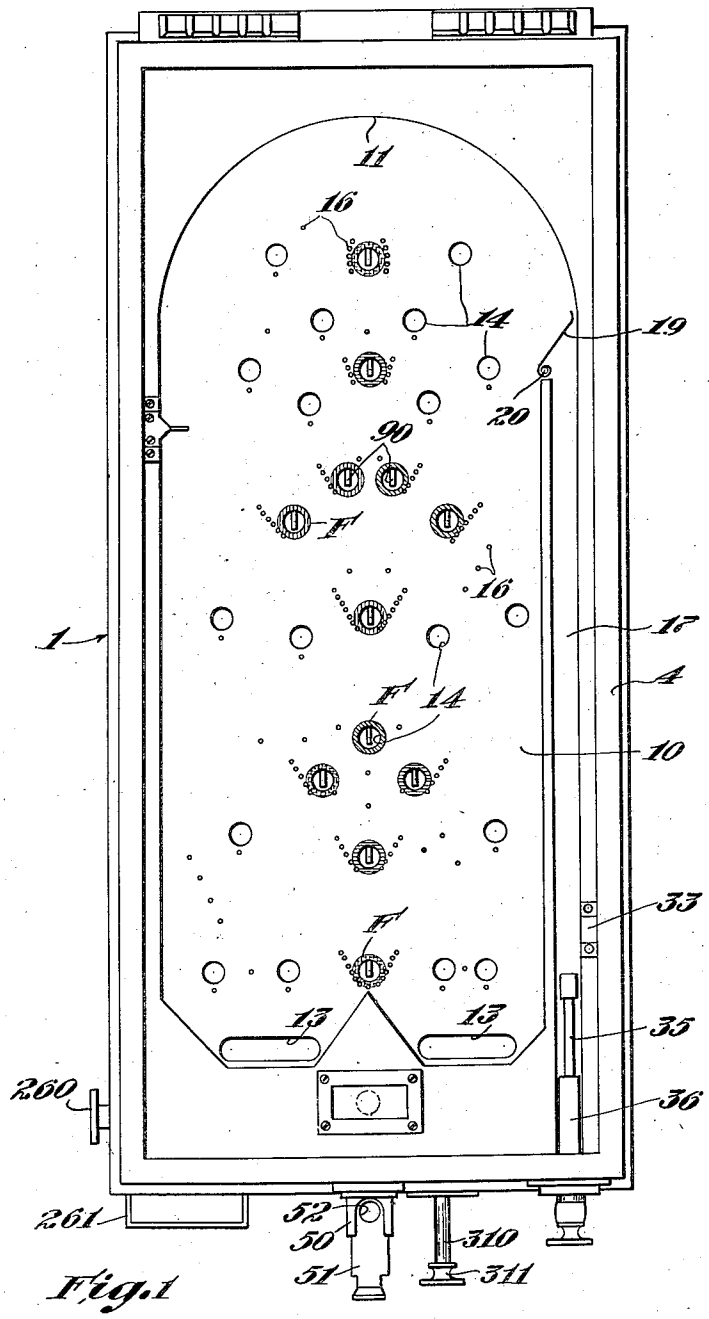


Fig. 1

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June 4, 1935. C. R. DUMBLE 2,003,349

DISPENSING AND GAME PLAYING MACHINE

Filed Nov. 25, 1933 7 Sheets-Sheet 2

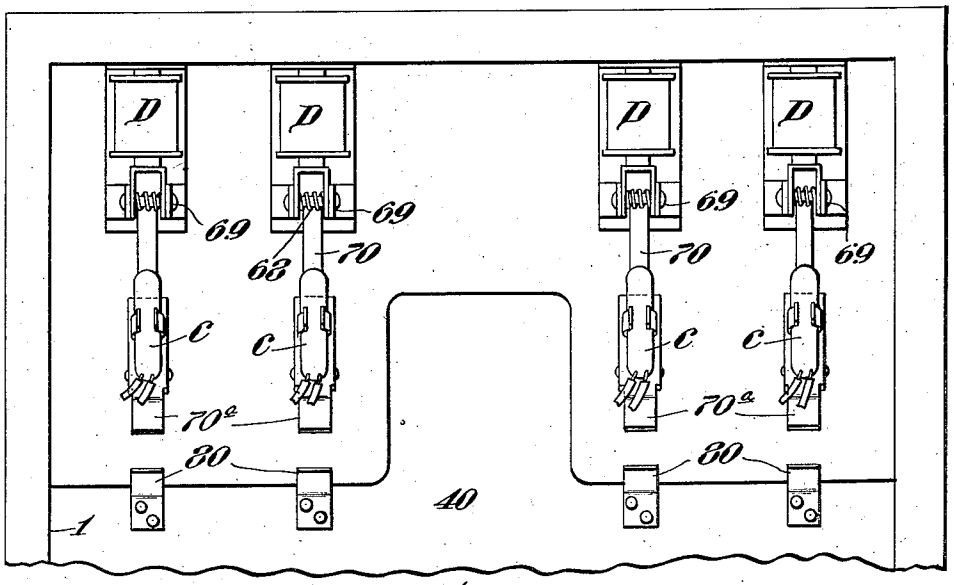


Fig. 2

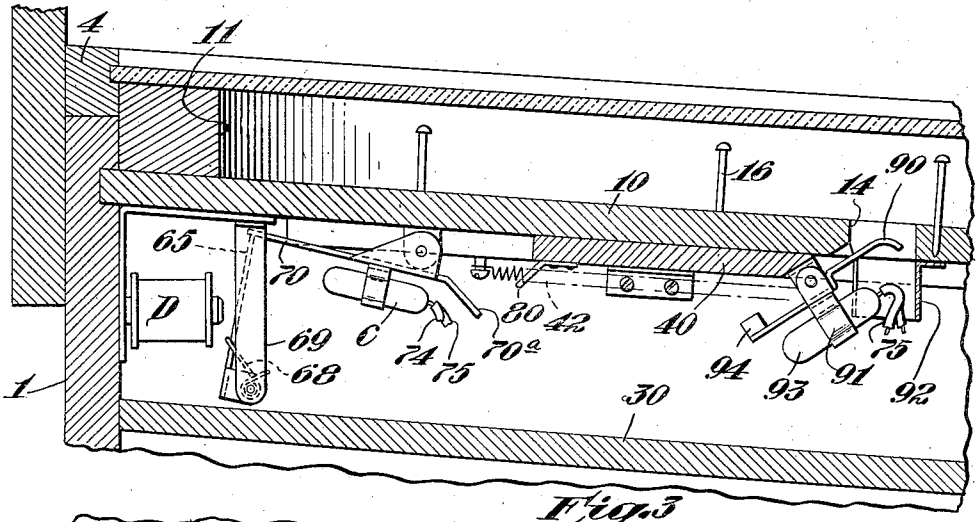


Fig. 3

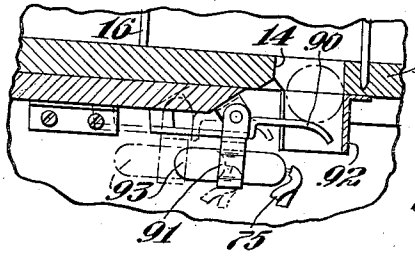


Fig. 4

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June 4, 1935. C. R. DUMBLE 2,003,349

DISPENSING AND GAME PLAYING MACHINE

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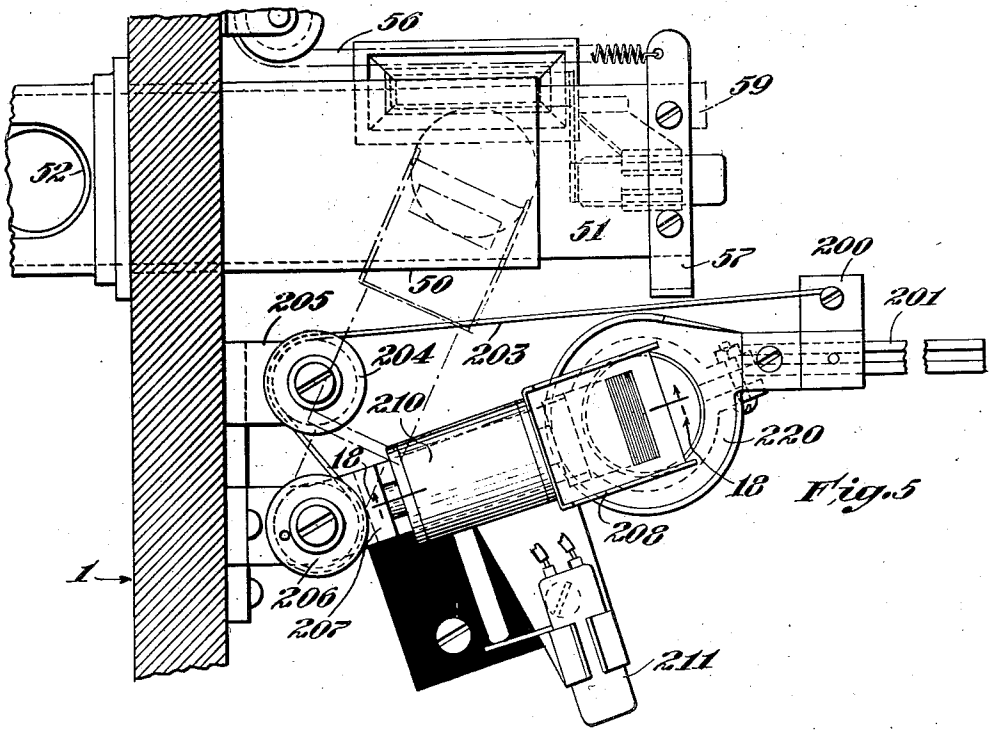


Fig. 5

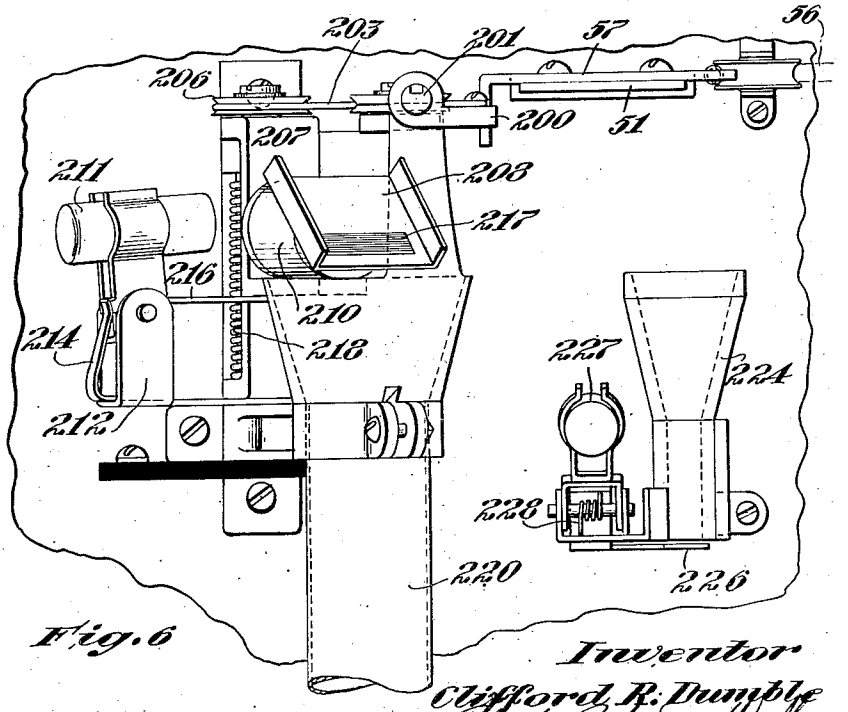


Fig. 6

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June 4, 1935. C. R. DUMBLE 2,003,349

DISPENSING AND GAME PLAYING MACHINE

Filed Nov. 25, 1933 7 Sheets-Sheet 4

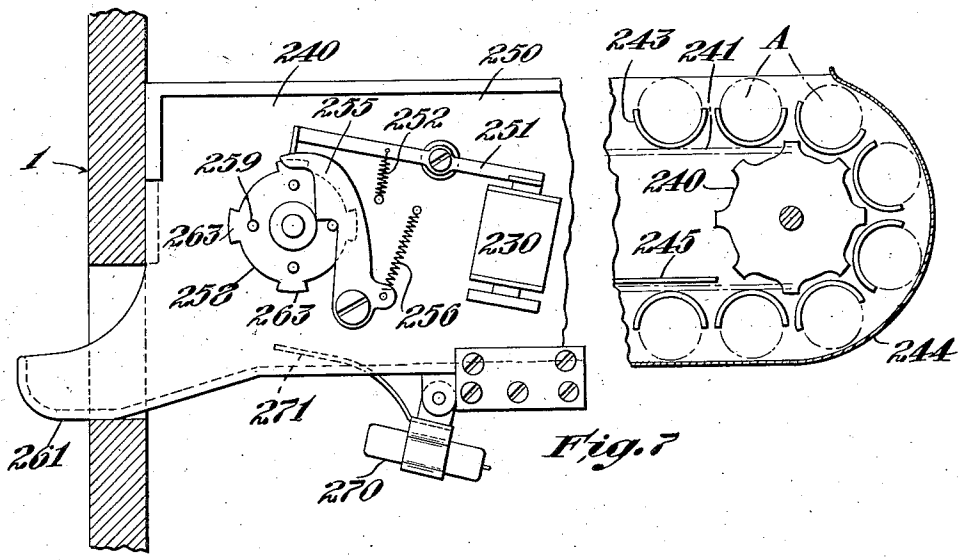


Fig. 7

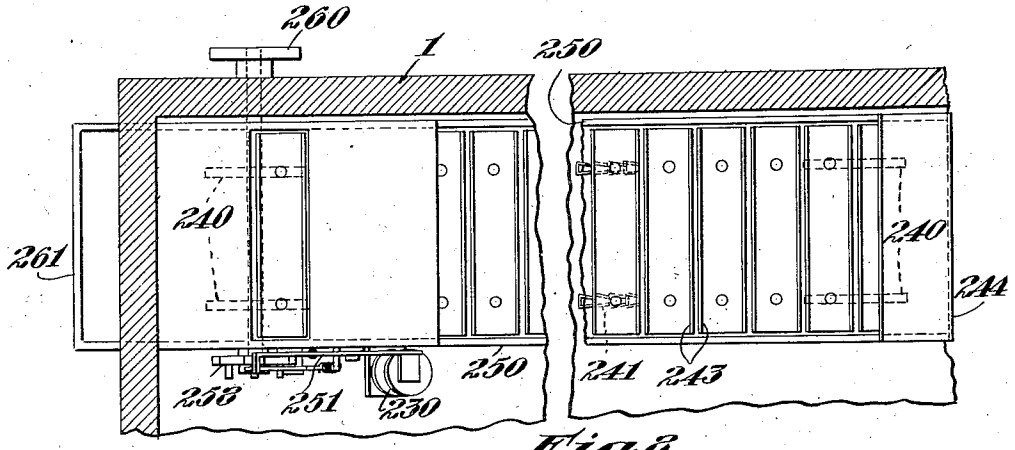


Fig. 8

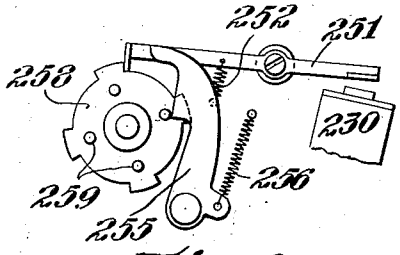


Fig. 9

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June 4, 1935. C. R. DUMBLE 2,003,349

DISPENSING AND GAME PLAYING MACHINE

Filed Nov. 25, 1933 7 Sheets-Sheet 5

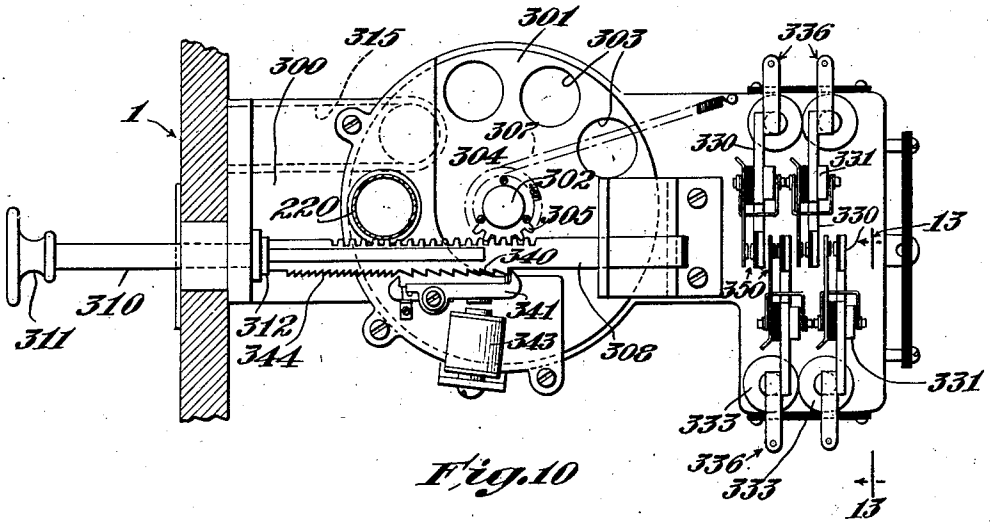


Fig. 10

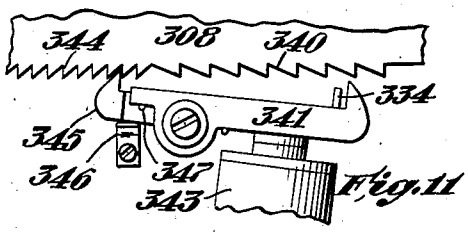


Fig. 11

Fig. 12

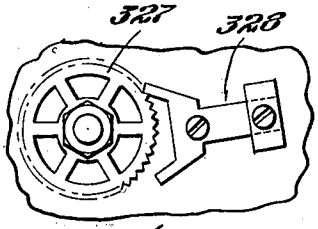


Fig. 14

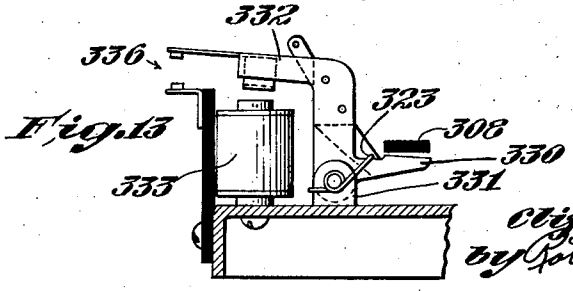


Fig. 13

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DISPENSING AND GAME PLAYING MACHINE

Filed Nov. 25, 1933 7 Sheets-Sheet 6

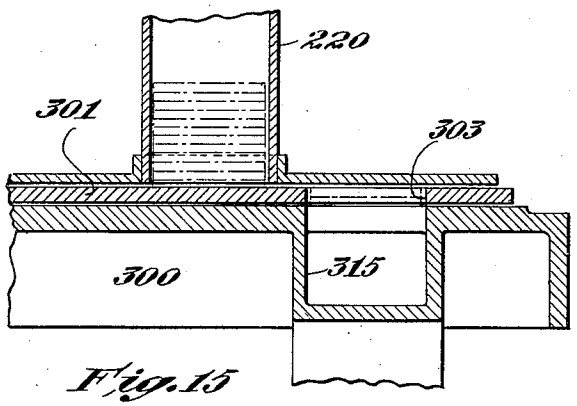


Fig. 15

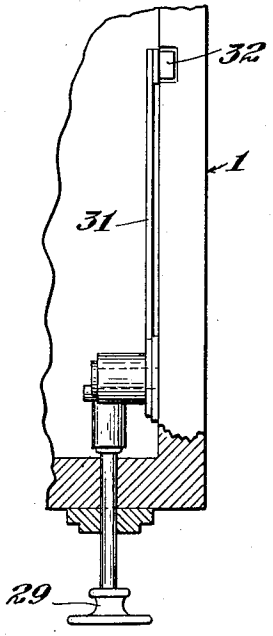


Fig. 16

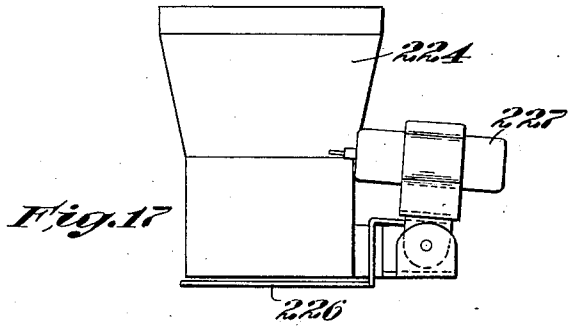


Fig. 17

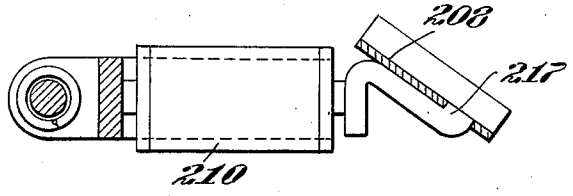


Fig. 18

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DISPENSING AND GAME PLAYING MACHINE

Filed Nov. 25, 1933 7 Sheets-Sheet 7

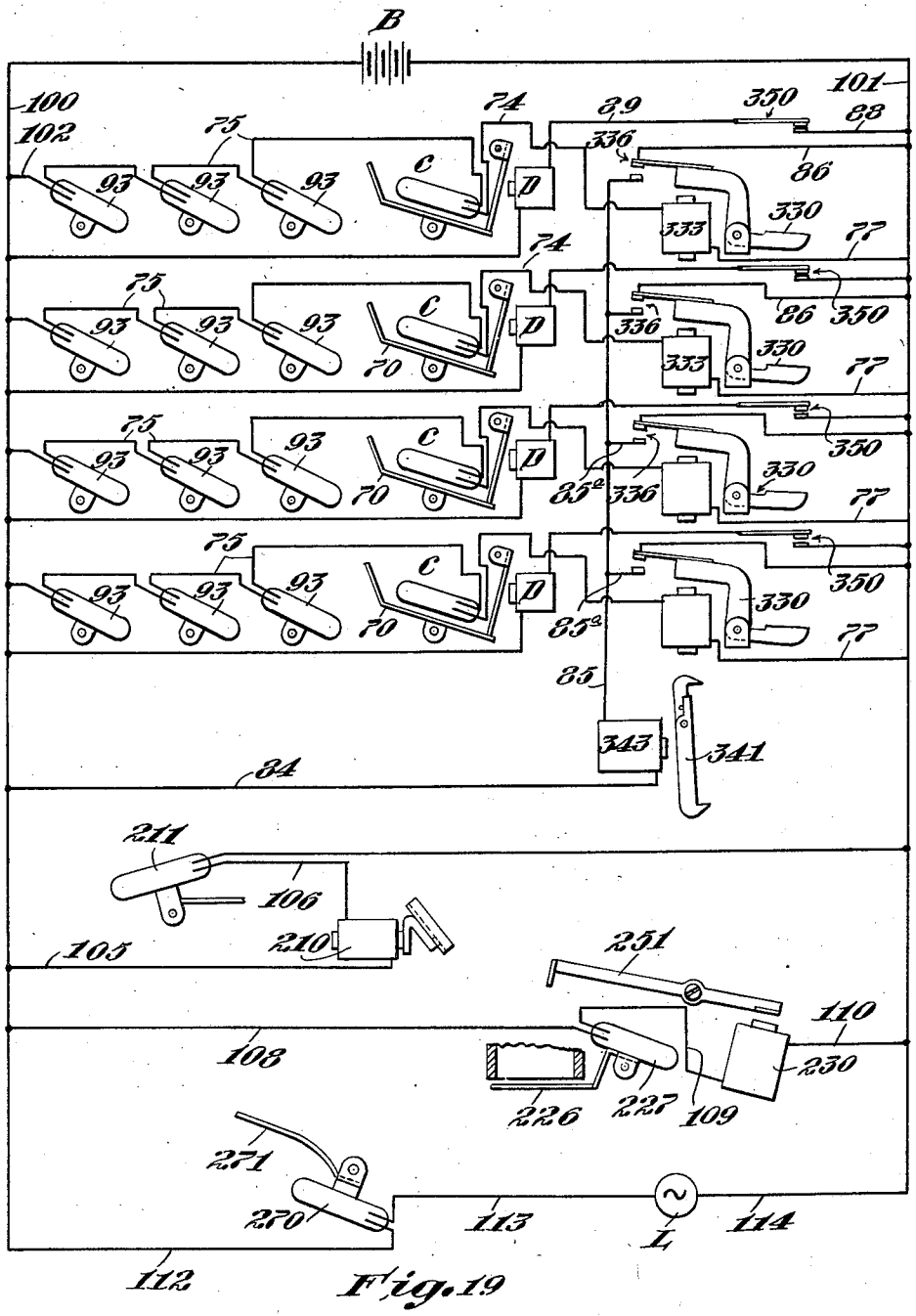


Fig. 19

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Patented June 4, 1935 2,003,349

UNITED STATES PATENT OFFICE

2,003,349

DISPENSING AND GAME PLAYING MACHINE

Clifford R. Dumble, Arlington, Mass., assignor to William B. Spieler, Brookline, Mass.

Application November 25, 1933, Serial No. 699,675

11 Claims. (Cl. 194—10)

This invention relates to an improved game playing and dispensing device or machine, and particularly to such a device adapted to receive either coins or playing disks to permit playing of the game and also to vend merchandise when a coin is received. In certain respects, this invention affords improvements upon and further developments of the machine disclosed in my copending application Serial No. 675,719, filed June 14, 1933, wherein a machine of the general type shown herein is generically claimed.

More specifically, the present invention affords a machine of the type wherein a ball or a plurality of balls may be projected over a board having a plurality of openings therein; certain of these openings have trigger devices associated therewith so that, by proper manipulation of the game playing portion of the machine, suitable instrumentalities may be conditioned to permit the operation of a playing disk returning mechanism. Preferably certain sets of the opening are provided with trigger devices arranged so that the disk returning mechanism may be operable when a ball is received in each one of the openings of a set. Thus several groups of spaced openings may be provided with definite designations, as with different colored rings, so that when balls are received, for example, in each of three openings surrounded by red rings, the disk returning mechanism is conditioned so that a given number of playing disks may be returned to the operator. These playing disks are so shaped and designed that they permit a replaying of the game and preferably may have characteristics permitting them to be readily distinguishable from coins of a corresponding size. Preferably different sets of openings have trigger devices so associated with the disk returning mechanism that a different number of disks may be returned to the player or operator in response to reception of a ball in each one of the openings of the different respective sets. Thus a group of openings provided with red rings may be arranged so that two disks may be returned, another group of openings provided with green rings may be arranged so that four disks are returned, etc.

A further feature of the invention is the provision of merchandise vending means preferably arranged to permit the dispensing of candy mints when a coin is received in the machine. Thus when a coin is inserted in the machine, a definite quantity of merchandise may be dispensed, while the game may also be played and the player may enjoy the possibility of so projecting the balls over the playing board that he may receive a plurality of playing disks which will permit repeated playing of the game, although not permitting further dispensing of merchandise. Each time that the game is played, following either the insertion of a coin or a playing disk, the player, if able to project balls in each of the holes of a given series, may receive a plurality of playing disks to permit replaying of the game.

In order to enable the operation of the machine with either coins or playing disks and to permit the return only of playing disks as well as the sale of merchandise in response to the insertion of coins, selector means preferably is provided to direct a coin to one part of the machine to operate the merchandise vending mechanism and to direct a playing disk to another part of the machine from which it may pass through the disk returning mechanism.

Further aspects of the invention relate to the structural arrangement and features of the various cooperating mechanisms. For example, the merchandise vending mechanism includes a novel arrangement of chains provided with buckets, particularly adapted to support articles of merchandise such as conventional rolls of candy mints, and associated mechanism arranged to permit the step by step movement of the chain with its buckets. Accordingly when a coin is inserted the chain may be advanced one step to bring a bucket to dispensing position.

In the accompanying drawings:

Fig. 1 is a top plan view of the machine, with the glass panel removed;

Fig. 2 is a view partly in section and partly in bottom plan of a portion of the rear part of the machine;

Fig. 3 is a cross section of the rear portion of the machine shown in Fig. 2, with related parts also illustrated;

Fig. 4 is a sectional view of a portion of the assembly shown in Fig. 3, illustrating optional positions of the parts;

Fig. 5 is a top plan view of the coin or disk receiving and selecting means and related parts, with parts broken away and shown in section, certain parts shown in an optional position by dot and dash lines;

Fig. 6 is a rear elevation of the assembly shown in Fig. 5;

Fig. 7 is a broken side elevation of the vending mechanism with parts broken away and shown in section;

Fig. 8 is a similar top view of the same;

Fig. 9 is an elevational detail showing optional

positions of certain of the parts illustrated in Fig. 7;

Fig. 10 is a top view of the disk returning mechanism with parts shown in section;

Fig. 11 is a top detail view of a portion of the mechanism shown in Fig. 10;

Fig. 12 is a side elevation of the assembly shown in Fig. 10, with parts broken away and shown in section;

Fig. 13 is a section on line 13—13 of Fig. 10;

Fig. 14 is a bottom view of a part of the mechanism shown in Fig. 10;

Fig. 15 is a vertical section of a portion of the disk returning mechanism;

Fig. 16 is a top view of a portion of the game playing mechanism;

Fig. 17 is an elevational detail of a portion of the coin receiving means;

Fig. 18 is a section on line 18—18 of Fig. 5; and

Fig. 19 is a wiring diagram with certain of the related parts schematically illustrated.

To facilitate an understanding of this invention, I will first generally describe a type of game device to which the principles of this invention may be applied. This machine or device comprises a generally rectangular or box-like cabinet 1 which may be mounted on any suitable supporting legs (not shown) and may be provided with an inclined cover 4 including a suitable glass panel so that the movement of balls within the casing may be readily observed. Disposed beneath the glass panel in the upper part of the casing 1 is a pin board proper, designated by numeral 10. This board is provided with a marginal frame adapted to act as a guide for the balls and is slightly inclined upwardly toward the rear so that the balls projected toward the rear wall or curved surface 11 normally roll down toward the front of the machine where they may be received in slots 13. The board 10 is provided with a plurality of openings 14 to receive the playing balls.

Disposed on the board in various spaced positions as well as in groups or rows about or in the vicinity of the openings 14 are pins 16 against which a ball may strike or bounce, thus being diverted from its original path and adding to the interest and uncertainty of the game.

At one side of the board 10 a groove or alley 17 is provided along which a ball may be impelled to the playing surface of the board. A spring 19 mounted on an upright pin or stud 20 at the outlet end of alley 17 is arranged to prevent return movement of a ball from the body portion of the board 10 to the alley. Beneath the pin board 10 is a lower board 30 (Fig. 3) forming the bottom of a ball receiving chamber. Thus balls passing downwardly through openings 14 or slots 13 ultimately may pass into this chamber as will be more fully explained. From this chamber the balls may roll downwardly into a receiving compartment at the front right-hand corner of the machine.

A swinging elevator arm 31 (Fig. 16) provides an end flange 32 movable in this receiving compartment to engage a single ball and elevate the same to the region of a transverse passage or trough 33 through which the ball passes into the alley 17, this general arrangement of the ball returning and elevating mechanism being well known and conventional in the art. A handle 29 is provided to actuate the elevator 31 through linkage 34. The balls themselves may conveniently be formed of metal not susceptible to magnetic attraction, such as aluminum.

A playing plunger 35 provided with an exterior handle extends into the front end of alley 17 and is normally held in the position shown in Fig. 1 by a coil spring (not shown) disposed within a metal casing 36. When the handle of the plunger is pulled, the plunger is retracted to compress the spring so that upon release of the handle the plunger may be returned or snapped back to its normal position under the influence of the spring, thus driving the ball along alley 17, past spring 19, in the direction of the curved abutment surface 11. The ball may then roll forwardly over the board 10 normally passing into engagement with certain pins 16 and perhaps falling into one of the openings 14 or perhaps continuing to the lower front end of the board and being received by one of the slots 13.

A sliding panel 40 (Fig. 3) may be mounted beneath the pin board 10 and be supported by suitable brackets at its edges. A tension spring 42 is normally effective in holding the panel in a position toward the front of the machine, where it may engage a suitable stop (not shown). In its normal position the panel 40 underlies slots 13 and certain of the openings 14 so that the balls passing into the slots or openings are held in view of the player until a subsequent operation or movement of the panel is effected. In accordance with this invention, special means, which will be more fully described, are associated with the panel 40 and are effective in holding the balls positioned in the remaining openings so that the total number of balls passing into the openings after a given period of play may be readily ascertained. Ordinarily the scores which are counted for rolling the balls in the individual openings are indicated by numbers on the board itself so that the player can readily calculate his score.

Colored circles F may be painted on the board 10 to identify the sets of openings which are particularly significant in operating the disk returning mechanism. Thus there may be a plurality of sets of openings thus designated; for example, four sets of three openings each are illustrated herein, each set being identifiable by rings of an individual color.

Now referring in detail to the disk or coin receiving mechanism, it is to be understood that a fixed bracket 50 receives a slider 51, this plate as shown having a circular opening 52 to receive a disk or coin resting on bracket 50. A tension spring 56 (Fig. 5) is connected to a transverse bar 57 at the inner end of slider 50 and normally tends to hold the slider in the position illustrated in Fig. 1. This bar is arranged to engage a depending lug 59 on the sliding panel 40 so that the latter may be slid toward the back of the machine when a coin or disk is inserted in the recess 52 and passes under the conventional latching mechanism (not shown).

At the rear of the machine (Figs. 2 and 3) are a plurality of fixed magnets D arranged in parallel circuits, as will be more fully described. Each of these magnets is associated with a swinging armature 65 pivotally mounted on a bracket 69 depending from board 10. A spring 68 normally holds each armature 65 in the retracted position, shown in Fig. 3, wherein the armature serves as a lock to hold a swinging support 70 in the illustrated tilted position. The member 70 supports a mercury switch element C which, when in the position illustrated in Fig. 3, is effective in closing contacts between leads 74 and 75. When the magnet D is energized, the locking armature 65 is moved out of its position beneath

support 70 and the latter swings downwardly to break the circuit between leads 74 and 75. When the parts are in this position and panel 40 is moved toward the rear of the machine due to the operation of slider 51, a depending lug or ear 80 carried by panel 40 engages a downwardly inclined end portion 70a of member 70 to return the latter and the switch tube C to normal position, whereupon the spring 68 may be effective in moving the locking armature 65 under the opposite end of member 70.

Beneath the openings 14 which are provided with the colored rings F are trigger elements 90 which are in effect extensions of swinging brackets 91 supporting mercury containing tubes or switch elements 93. These mercury switches are disposed in series between consecutive sections of leads 75. As illustrated, there may be several, as for example three, switches 93 arranged in series in each lead 75. Accordingly when the three switches of one set are closed due to balls received upon the corresponding trigger elements 90, a circuit is closed to permit the operation of the disk returning mechanism in a manner which will be more fully described.

The normal position of a trip or trigger element 90 in relation to the opening 14 is shown in Fig. 3. Disposed beneath the opening is a depending sheet metal member 92 of substantial U-shaped cross section. The trip 90 carries a continuation in the form of an upstanding stop portion 94 for extending behind the opening between the legs of the hood 92. The position of parts 90 and 93, when a ball has been received in the corresponding opening 14, is illustrated in Fig. 4. As shown in full lines in this figure, the member 90 is tipped so that stop 94 engages panel 40, the circuit between lead sections 75 being closed in this position of the parts and the ball being supported in opening 14. It is thus evident that trip elements 90 may be effective in holding the balls in the corresponding openings 14 while portions of the panel 40 are effective in supporting the balls in the remaining openings.

After all of the balls have been projected over the board 10 and the player has calculated his score, the slider 51 may again be actuated to move the panel 40 back. Each element 90 then moves rearwardly into the position shown in dot and dash lines in Fig. 4, thus permitting the ball to drop onto the board 30. Accordingly when the panel 40 is slid toward the rear of the machine, it moves the triggers or trips 90 out of the positions wherein they retain the balls in the corresponding openings 14, while it permits the balls to drop, not only from these openings, but also from the remaining openings 14 and from the slots 13. Thus return of the balls to the elevating and projecting instrumentalities is permitted.

The disk or coin receiving mechanism is arranged to release a disk or coin from recess 52 of slider 51 when the latter moves inwardly sufficiently to slide the panel 40 to the ball releasing position. When the slider 51 is thus being actuated, it engages a movable abutment element 200 (Fig. 5) which is slidably mounted on a fixed rod 201. A cable 203 extends forwardly from the element 200 about an idler pulley 204 supported by a fixed bracket 205 at the front of the machine and to a hub element 206 on a swinging bracket 207. Thus as the slider 51 moves inwardly the transverse bar 57 engages element 200 which pulls cable 203 to cause the bracket 207 to swing beneath the inner end of the slider. The swinging bracket 207 carries an inclined trough-like chute 208 which moves beneath an opening in the slider bracket 50 to receive the coin or disk released from the slider.

A magnet 210 is mounted on the swinging support 207 and is connected in series with a mercury switch 211 which is pivotally mounted on a fixed support 212. An arm 216 projecting from the swinging member 207 is engageable with an extension of the mercury switch support so that the member 207, when in its normal position, shown in full lines in Fig. 5, is effective in holding the switch 211 in such a position that the circuit of magnet 210 is maintained in an open condition. When the swinging support 207 moves to the position, shown in dot and dash lines, beneath the slider 51, the switch 211 moves under the action of a spring 214 to its circuit closing position, thus being effective in causing energization of magnet 210. The latter has a pole portion 217 (Fig. 18) projecting to the surface of the trough 208. Thus when a playing disk, which may, for example, be made of steel, is inserted in the slider and received from the same by the trough 208, the magnet 210 is effective in holding the disk upon the trough. As soon as the slider 51 is released the spring 218 associated with bracket 207 is effective in returning the latter and trough 208 to the position shown in full lines. As these parts move to this position, the switch 211 is opened by arm 216 and magnet 210 is deenergized, so that the playing disk is released, whereupon it may slide from the inclined trough into the upstanding disk receiving duct 220.

When a coin is received from the slider 51, it falls to the trough 208, but the magnet 210 is not effective in holding the coin on the trough, so that the coin slides immediately downwardly to be received by a coin chute 224 before the trough 208 leaves its dot and dash line position.

As shown in Figs. 6 and 17, a trip element 226 is mounted at the lower end of the chute 224 and is adapted to be actuated due to the weight of a coin passing downwardly through the chute, thus permitting the coin to drop from the chute into any suitable coin receiving receptacle (not shown) while moving a mercury switch element 227 to circuit closing position. A spring 228 is normally effective in holding the trip element 226 and switch tube 227 in the position illustrated in Figs. 6 and 17. When the switch tube 227 is moved to its circuit closing position, a magnet 230 (Fig. 7) is energized to release locking means on the merchandise vending mechanism, which will now be described.

This mechanism may include suitable sprockets 240 supporting a pair of parallel link chains 241. Extending between corresponding links of these chains are substantially semicylindrical buckets 243 conveniently formed of sheet metal. Thus one end of each bucket may be secured as by a rivet to one link of one of the chains 241. These buckets preferably are of a size and shape to receive a roll of candy mints. Extending about the end portion of the chain loop and beneath its lower run is a sheet metal retaining element 244 which prevents the articles of merchandise from dropping out of the semicylindrical buckets. A plate 245 is disposed above the lower run of the chain to hold the latter in proper position and to prevent possible upward buckling of the chains and wedging of the mints and buckets. Suitable supporting plates 250 are disposed adjoining the sprockets 240 to support the assembly and to prevent endwise movement

of the articles of merchandise which are herein designated by reference character A.

The magnet 230 is secured to one of the plates 250 and a swinging locking element 251 is pivotally mounted on this plate with one of its ends forming an armature for magnet 230. A spring 252 normally holds this end of member 251 in a retracted position spaced from the magnet. The opposite end of member 251 is provided with a depending lug which is engageable with a pivotally mounted abutment element 255 or with a locking wheel 258. A tension spring 256 normally tends to swing the element 255 in an anti-clockwise direction as viewed in Fig. 7. Locking wheel 258 is arranged to rotate with one of the pairs of pulleys supporting the conveyor chain assembly. This wheel is provided with a plurality of pins 259 which are engageable with the element 255.

When the member 251 is swung to portative position, the upper end of member 255 swings in an anti-clockwise direction under the tension of spring 256 until stopped by one of the pins 259 (Fig. 7). In this position of the parts, the end of member 251 is supported by the member 255 so that the former is mechanically held in its portative position. The handle 260 may then be turned to permit the movement of the chains 241 and buckets 243 to supply one of the articles A to an outlet receptacle 261. As the handle 260 is thus moved, a pin 259 engages the member 255 with a cam-like action (Fig. 9) to cause that member to swing in a clockwise direction against the action of spring 256 so that its upper end moves out of its position beneath the end of the armature member 251. The latter therefore swings downwardly under the action of spring 252 to engage the periphery of the wheel and to form a stop limiting the movement of member 255 in an anti-clockwise direction (Fig. 9). In this position of the parts, a lug 263 upon the periphery of the wheel is engageable with the depending end portion of member 251 to prevent turning of handle 260 to a sufficient extent to allow the dispensing of an additional article A. Thus while the magnet 230 is only energized momentarily in response to the movement of a coin past the trip 226, such an energization is sufficient to move the armature 251 to portative position, thus permitting the member 255 mechanically to hold the armature out of engagement with the wheel 258. Accordingly the latter may be rotated and the bucket chain assembly moved until one of the pins 259 moves the member 255 out of the position wherein it holds the armature in portative position. Thereupon the latter returns into locking engagement with the wheel to prevent further movement thereof.

Adjoining the lower runs of the chains 241, I provide a mercury switch element 270 which is provided with an upwardly extending arm 271 normally engageable with an article A adjoining the receptacle 261. Thus as long as articles A remain in the machine, the circuit with which switch element 270 is associated may remain in an open condition. When the last bucket 243 adjoining the receptacle 261 is empty, the arm 271 may swing upwardly so that the member 270 moves to circuit closing position, whereupon a suitable transparency may be illuminated to indicate that there are no longer articles of merchandise to be vended.

The disk receiving duct 220 extends downwardly to the disk returning mechanism which includes a bracket structure or casting 300 (Figs. 10 and 12) affording a support for a dispensing wheel or disk 301 which is in the form of a circular metal plate rotatable about an axial stud 302 projecting upwardly from the support 300. A peripheral portion of the wheel 301 is provided with a series of circular openings 303 each having a diameter substantially conforming to that of the playing disks. The number of openings 303 corresponds to the number of sets of trigger devices 90 which may be actuated to permit operation of the disk return mechanism.

In its normal position the wheel 301 is disposed so that the nearest opening 303 is out of registration with the lower end of duct 220; accordingly a solid portion of the wheel 301 affords a bottom for the duct, and in effect a cylindrical receptacle is provided in which the disks are stacked (Fig. 15). A pinion 305 is mounted to rotate with the wheel 301. A coil spring 307 is fixed to and wrapped about a portion of the hub or sleeve 306 between the wheel and pinion and is connected to a fixed part of the casting 300. Accordingly the spring is normally effective in holding the wheel in the position illustrated in Fig. 10, wherein the openings 303 are out of registration with duct 220.

A rack bar 308 is mounted to reciprocate above the wheel 301 and has a toothed edge portion in meshed engagement with the teeth of pinion 305. An operating plunger 310 is provided with an exterior handle 311 and with an end portion having a shoulder with a collar engaging an upturned extension 312 of the rack bar 308. Thus when the plunger is pushed inwardly, the rack bar, if free to move, may be effective in causing rotation of the disk or wheel 301 to bring one or more of the disk receiving openings 303 beneath the duct 220. The support 300 affords a surface beneath the openings 303 so that in effect these openings afford moving disk receiving recesses. Preferably the thickness of wheel 301 is so determined that each opening 303 may receive two disks. When the plunger 310 is released, the spring 307 tends to move the wheel 301 to its inoperative position and cause the plunger 310 to return to its normal position.

A portion of the supporting casting 300 provides a chute 315 with an open upper end adapted to register with the openings 303 as they move away from the duct 220. Thus as one or more of the openings is moved from the region of duct 220 under the action of spring 307, disks are released into the chute 315 which has a lower portion provided with a swinging closure 325. The latter is normally held in the position illustrated in Fig. 12 by a spring 326 but may be swung downwardly by the operator of the machine so that the disks released by the wheel 301 may be received in the hand of the operator.

In order to prevent too rapid movement of the wheel 301 in either direction, an escapement mechanism, shown particularly in Figs. 12 and 14, is associated with the wheel. This escapement mechanism may be of conventional form, including a notched or toothed wheel 327 rotatable with the wheel 301 and a weighted pallet member 328.

Disposed adjoining the inner end of rack bar 308 are a plurality of swinging stop elements 330 which are pivotally mounted on supporting brackets 331. These elements 330 have armature portions 332, associated with corresponding electro-magnets 333 and are normally held in non-portative positon by springs 323 (Fig. 13). Accordingly when one of the electromagnets 333 is energized, the end of the corresponding mem-

ber 330 is swung upwardly into the path of the rack bar 308 to limit the inward movement of the latter. The arrangement of the members 330 is such that the rack bar may be moved different distances corresponding to the spacing of the openings 303 to permit the reception of playing disks from duct 220 in one or more of the openings, depending upon which one of the magnets 333 is energized. Each of these magnets is electrically connected to one of the sets of switch tubes 93 associated with triggers 90. As shown in Fig. 13, switch contacts are associated with each member 330 so that a switch 336 may be closed when the member 330 moves to portative position.

The rack bar 308 is provided with a series of ratchet teeth 340, which are engageable with a locking pawl 341 in the form of a swinging armature associated with an electromagnet 343. Teeth 340 are shaped to oppose inward movement of rack bar 308. A spring 339 (Fig. 12) normally presses the pawl 341 toward the teeth 340 to prevent inward movement of the rack bar 308 in response to a push on the plunger 310. In the normal position of pawl 341, a brass pin 334 carried thereby engages the edge of one of the teeth 340, while the hooked end of the pawl element may normally be separated by a small clearance space from the rack bar, as shown in Fig. 10. This arrangement is advantageous in avoiding the tendency of residual magnetism to oppose movement of the pawl 341 away from bar 308 when magnet 343 is energized. The magnet 343 is arranged to be energized in response to closing of all the trigger switches 93 in any one of the sets of these switches and consequent closing of a switch 336, thereupon drawing the pawl 341 out of engagement with the rack bar and permitting the latter to be movable inwardly.

A second set of ratchet teeth 344 are also formed on the edge of the rack bar 308 and are engageable with a pawl 345 mounted to swing on a common pivot with the pawl 341. The teeth 344 and pawl 345 are arranged to permit inward movement of the plunger but to oppose its outward movement. As shown in Fig. 11 the pawl 345 is normally urged inwardly by a light leaf spring 346 and is provided with a pin 347 engageable with the end of pawl 341. Thus when the latter is in its normal position, it is effective through the pin 347 in causing pawl 345 to remain out of contact with the rack bar, as shown in Fig. 10.

When the magnet 343 attracts pawl 341 to the position shown in Fig. 11, the pawl 345 is pressed inwardly against the teeth 344 by the spring 346. Accordingly under these conditions the plunger 310 may be pushed inwardly to rotate the disk 301 for a fraction of a revolution to permit one or more of the openings 303 to pass under the duct 220. But at this time, due to the positioning of pawl 345, the plunger can not be moved outwardly until it first engages a movable contact of a switch 350 on a stop member 330 at the inner end of its path, the length of this path depending on which of the magnets 333 has been energized. As bar 308 presses the movable contact against a fixed contact on the stop member, the closing of the switch 350 results in the energization of one of the relay magnets D (Fig. 2) at the back of the pin board, thus breaking the circuits through the magnets 333 and 343, as will be more fully described with reference to the wiring diagram. Thereupon the pawl 341 moves into a position to prevent further inward movement of the plunger 310 and rack bar 308. Accordingly if the foremost member 330 is moved upwardly into the path of member 308, the plunger may be pressed inwardly only enough to permit the filling of one of the openings 303 with playing disks, while if the rearmost element 330 is moved upwardly, all of the openings may pass under the duct 220 and receive disks.

When the magnet 343 is deenergized, the armature pawl 341 swings to the position illustrated in Fig. 10, moving pawl 345 away from the rack bar so that the latter may then move outwardly under the action of spring 307, thus causing rotation of the wheel 301 in a clockwise direction, as viewed in Fig. 10, and moving the opening or openings 303 over the outlet duct 315 so that the playing disks pass into this duct.

It is evident that the arrangement of the pawls 341 and 345 prevents repeated reciprocatory movements of the rack bar before it reaches the end of its path and consequent repeated unauthorized movements of the wheel 301 to permit an opening 303 to be repeatedly moved under the duct 220 and over the outlet chute 315. Thus an unjustifiably large number of playing disks can not be received in response to the movement of element 341 out of its locking position.

The plunger 310 preferably engages the rack bar 308 with a light sliding grip so that should an operation of this type be attempted, the plunger may slide in relation to the rack bar. Ordinarily it will be observed that a collar on the plunger is effective in engaging the upturned portion 312 of the rack bar to permit the same to be pushed inwardly, while the collar engages a fixed part of the casting 300 and in turn acts as a stop to limit the movement of the rack bar and the wheel 301 under the tension of spring 307.

Fig. 19 provides a diagram of the wiring connections and associated instrumentalities which may be employed in a machine of this character. Current may be received from a suitable source of supply such as a battery B disposed in casing 1. The opposite sides of the battery may be connected to leads 100 and 101, respectively. Parallel leads 102 may extend from the lead 100 to one of the switch tubes 93 of each set, which are connected in series by lead sections 75, the last tube 93 of each set being connected through a section 75 to a switch tube C at the rear of the cabinet. From the element C of each assembly a lead 74 extends to the corresponding magnet 333 of the disk returning mechanism; from magnet 333 a lead 77 extends to the return lead 101. Thus, when all three switches 93 of one set are closed and the serially connected switch C remains closed, a circuit is provided from the battery B through a magnet 333.

The magnet 343 is connected by a lead 84 to the main lead 100, and a lead 85 extending from the opposite side of the magnet has branches 85^a connected respectively to the switches 336 which are adapted to be closed when the associated members 330 move to portative position. Switches 336 are connected by leads 86 to the return lead 101. Accordingly, when a magnet 333 is energized, the corresponding switch 336 completes a circuit through leads 100 and 84, magnet 343, lead 85, one of the branches 85^a, the corresponding switch 336, lead 86 and lead 101. Thus the magnet 343 is energized in response to the energization of any one of the magnets 333. Magnet 343, when energized, moves pawl 341 from rack bar 308, permitting

the latter to be pushed inwardly to operate the disk returning mechanism.

When plunger 310 is pushed inwardly the rack bar 308 is effective in closing one of the switches 350. A lead 88 extends from lead 101 to each switch 350 from which a lead 89 extends to the corresponding magnet D at the rear of the machine; each magnet D is connected to the lead 100. Accordingly when a switch 350 is closed by rack bar 308, the corresponding magnet D is energized to move switch tube C to circuit opening position, thus breaking the circuit through the corresponding magnet 333. Thereupon the corresponding switch 336 is opened due to movement of member 330 to non-portative position. Opening of switch 336 results in deenergization of magnet 343, thus permitting pawls 341 and 345 to return to normal position. Thereupon spring 307 is effective in returning wheel 301 and rack bar 308 to their normal positions.

When a switch C has been opened due to energization of magnet D, it may be closed through engagement of part 80 with the end 70a of support 70, when the panel 40 is slid rearwardly in response to the inward movement of slider 51 upon the insertion of a coin or disk.

As shown in Fig. 19, one side of the magnet 210 of the selector assembly is connected by lead 105 to lead 100, its opposite side being connected by lead 106 to control switch 211 and the latter is connected to return lead 101. Accordingly when support 207 moves away from switch 211 to permit the latter to close, the circuit through magnet 210 is completed and the latter may then be effective in holding a disk on trough 208 until the switch 211 is opened as bracket 207 and magnet 210 return to their normal positions, whereupon the disk may be discharged into duct 220 and thus pass into the return mechanism.

Switch tube 227 is connected by a lead 108 to main lead 100, and a lead 109 connects the tube to magnet 230 which in turn is connected through lead 110 to the main lead 101. Accordingly, when a coin dropping on trip 226 closes switch 227, the circuit through magnet 230 is completed, and the latter draws locking element 251 to portative position, where it is held by member 255 to permit one operation of the vending mechanism.

Switch tube 270 is connected by a lead 112 with main lead 100 and by a lead 113 with a warning light L which is arranged to call attention to the fact that the vending mechanism is empty. Light L is connected by a lead 114 to main lead 101. When part 271 does not contact an article A, switch tube 270 tips to circuit closing position and light L is energized. It is of course to be understood that a circuit arrangement of the type described herein may be employed in conjunction with a tilting control device of the type and in the manner disclosed in my copending application Serial No. 675,719.

The general operation of a machine of this character will now be described, with particular reference to the wiring diagram and with general reference to other portions of the mechanism, the operation of individual instrumentalities and assemblies having been previously discussed in respective instances.

Assuming that a coin is disposed on the recessed portion 52 of the slider mechanism, the slider 51 is then pressed inwardly so that the bar 57 is effective in sliding the panel 40 rearwardly, thus permitting the balls to pass downwardly from the slots 13 in the pin board as well as from the openings 14 which are normally closed by portions of the panel 40 or by the triggers 90. At the same time should a switch C be open, a member 80 may engage the part 70a of the corresponding member 70 to return the latter to its normal position, shown in Fig. 3, the latch 65 snapping into a position to support the member 70 and switch C in the position shown in that figure. Thus if a switch C was previously opened, it will be closed by this operation. The closing of switch C conditions the circuit extending between the corresponding sets of trigger switches 93 and the magnet 333. When the slider 51 is pushed inwardly in this manner, the member 57 also engages the sliding block 200 which is effective through cable 203 in causing the swinging movement of the selector assembly including the swinging bracket 207, the magnet 210, and the trough 208. Thus the latter is moved beneath the end of the slider 51 when it releases the disk.

Under these conditions the magnet 210, although energized, is not effective in retaining the coin on the chute 208 so that the latter directs the coin downwardly into the coin chute 224. The coin drops through this chute and momentarily depresses the trip 226 to close the switch 227, which is effective through leads 108, 109 and 110 in energizing the magnet 230 of the vending mechanism. Thereupon the member 251 is moved out of its locking position into portative position so that the handle 260 may be operated to advance the conveyor chain one step and deliver an article A to the receptacle 261, the rotation of the wheel 258 incidental to this delivery of an article to receptacle 261 being effective in moving member 255 out of engagement with the armature 251 so that the latter is no longer held in portative position but it is returned into locking engagement with the wheel 258.

The elevator handle 29 may then be operated to cause the movement of one of the balls through the trough 33 into the alley 17, whereupon the operator is ready to start playing. The playing plunger 35 is then pulled toward the operator and released, the spring associated with this handle being effective in causing the plunger to strike the ball and impel it through the alley 17, past spring 13 onto the playing surface of pin board 10. The ball normally may strike the abutment surface 11 and then roll downward, striking certain of the pins 16 and then falling into one of the openings 14 or passing downwardly to be received by one of the slots 13. The ball may be supported by the panel 40 or by a trigger 90. Thus as successive balls are impelled onto the board, the balls which are received in the openings 14 may be observed and the player or players may calculate the score. The balls may remain in this position until another coin or a playing disk is inserted in the machine.

When a player is successful in causing the balls to rest upon each one of a set of trigger elements 90, each of the corresponding switches 93 is moved to circuit closing position. Since the switch C is already in closed position, current may pass through leads 74 and 75 and switches 93 of the circuit corresponding to the depressed triggers 90 and thence to the magnet 333, which closes switch 336 to energize magnet 343 and release the plunger 310. Thereupon the player may push the plunger inwardly to rotate the

wheel **301** until the movement of rack bar **308** is limited by one of the armature stops **330** and a switch **350** is closed to energize a magnet D at the rear of the machine, thus to open switch C, deenergizing the magnets **333** and **343**. Thereupon the spring **307** is effective in causing the wheel **301** to rotate back to its normal position, emitting disks from one or more of the openings **303** into the chute **315**, from which they may be received by moving the closure **325** to its open position. The player may then repeat play several times, depending upon the number of playing disks received.

Under conditions of competitive play, two or more players having several playing coins or disks may play this game in turn, each projecting the balls over the pin board **10** and computing the scoring values of the openings into which they may roll balls. When a player receives additional disks due to the depression of a set of triggers by the balls, the additional playing disks permit him to operate the machine a number of additional times and to receive an increased score. It is thus evident that the arrangement of the trigger elements **90** in sets adds to the interest and uncertainty of the game.

Should a steel disk be employed to permit playing of the game, the slider **51** is moved inwardly in the manner already described and is effective through the bar **57** in causing the movement of the swinging selector assembly so that the chute or trough **208** is located beneath the slider and so that the panel **40** is slid rearwardly to release the balls. Under these conditions the switch **211** is closed so that the magnet **210** is energized, and since a steel playing disk has been inserted in the machine, this disk falling onto the trough **208** is retained by the magnet. When the slider **51** is released, the spring **56** is effective in returning it to normal position, the spring **42** moves panel **40** forwardly, and the spring **218** is effective in causing the movement of the swinging assembly back to the position shown in Fig. 5. Thereupon the arm **216** engages an extension of the support for switch **211**, causing the latter to move to its open circuit position and deenergizing magnet **210** so that the playing disk may then slide away from the pole **216** and drop into the duct **220**.

It is evident that when a disk is inserted, the balls are returned to a position where they may be lifted to playing position by the elevator **37** so that the game may be played in exactly the same manner as has been described in connection with the insertion of a coin, but that the insertion of a coin also permits the vending mechanism to be operable to deliver an article of merchandise.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. A machine of the class described, comprising a casing, a game playing assembly in the casing, a common slide movable to insert a playing disk or coin into the casing and to release the playing assembly for operation when it inserts either a disk or coin, and selector means to direct a disk thus inserted to one part of the machine and a coin to another part of the machine, said selector means including a swinging assembly movable on insertion of a coin or disk to receive the coin and direct it in one direction and being arranged to retain a disk until it swings to another position whereupon it automatically releases the disk.

2. A machine of the class described, comprising a casing, a game playing assembly in the casing, common means to receive a playing coin or disk capable of being magnetically attracted and to release of the playing assembly for operation in response to the reception of either a coin or disk, and selector means to direct a coin thus received to one part of the machine and a disk to another part of the machine, said selector means including a movable part arranged to direct a coin to the first-named part of the machine and to magnetically retain a disk while it moves to a position where it releases the disk to the second-named part of the machine.

3. A machine of the class described comprising a casing, means movable upon the insertion of a coin or playing disk in the casing, game playing mechanism including parts within the casing and an exterior operating handle to permit the manipulation of said parts, said means releasing the game playing mechanism for operation by said handle in response to the insertion of either a coin or a playing disk, a selector within the casing to direct coins and playing disks in different directions, spaced means to receive the coins and disks, respectively, playing disk return means conditioned by playing of the game in a certain manner to return playing disks from the interior of the machine to the operator thereof, said disk returning mechanism including a wheel having a series of openings therethrough, and an exterior operating handle associated with said wheel and adapted to move the same back and forth through a fraction of a revolution, said wheel having a plurality of openings therein arranged to receive playing disks and to move the same over an outlet opening.

4. A machine of the class described comprising a game playing assembly, disk receiving means arranged to release the assembly for operation when a playing disk is inserted in the machine, a plurality of electrical switches arranged to be actuated when the game is played in a certain manner, disk returning mechanism operable in response to actuation of said switches, said mechanism including a manually operable rack bar, a wheel rotatable thereby having a plurality of openings to receive disks, said wheel being rotatable in one direction through a fraction of a revolution whereby successive openings may receive disks, said wheel being rotatable in the opposite direction to emit the disks into an outlet passage, the extent of angular rotation of the disk determining the number of openings which receive disks and the number of disks that are emitted, a plurality of electromagnets each arranged to be energized in response to actuation of a different combination of said switches, and armatures associated with the magnets and each movable to a position to limit movement of the rack bar and thus determine the number of disks emitted.

5. A machine of the class described comprising a game playing assembly, disk receiving means arranged to release the assembly for operation when a playing disk is inserted in the machine, a plurality of electrical switches arranged to be actuated when the game is played in a certain manner, disk returning mechanism operable in response to actuation of said switches, said mechanism including a manually operable rack bar, a wheel rotatable thereby having a plurality of

openings to receive disks, said wheel being rotatable in one direction through a fraction of a revolution whereby successive openings may receive disks, said wheel being rotatable in the opposite direction to emit the disks into an outlet passage, the extent of angular rotation of the wheel determining the number of openings which receive disks and the number of disks that are emitted, a plurality of electromagnets each arranged to be energized in response to actuation of a different combination of said switches, armatures associated with the magnets and each movable to a position to limit movement of the rack bar and thus determine the number of disks emitted, and pawl means associated with the rack bar and wheel to prevent movement of the rack bar to and fro except to the limit of its path as determined by an armature in portative position and then back to its normal position.

6. A machine of the class described comprising a game playing assembly, disk receiving means arranged to release the assembly for operation when a playing disk is inserted in the machine, a plurality of electrical switches arranged to be actuated when the game is played in a certain manner, disk returning mechanism operable in response to actuation of said switches, said mechanism including a manually operable rack bar, a wheel rotatable thereby having a plurality of openings to receive disks, said wheel being rotatable in one direction through a fraction of a revolution whereby successive openings may receive disks, said wheel being rotatable in the opposite direction to emit the disks into an outlet passage, the extent of angular rotation of the disk determining the number of openings which receive disks and the number of disks that are emitted, a plurality of electromagnets each arranged to be energized in response to actuation of a different combination of said switches, armatures associated with the magnets and each movable to a position to limit movement of the rack bar and thus determine the number of disks emitted, pawl means associated with the rack bar and wheel to prevent movement of the rack bar to and fro except to limit of its path as determined by an armature in portative position and then back to its normal position, an electromagnet to condition the pawl means, and switch means associated with each of said armatures to control said last-named electromagnets so that the pawl means may permit only inward movement of the rack bar until it reaches the limit of its path and then permit only outward movement thereof.

7. A machine of the class described comprising a game playing assembly, disk receiving means arranged to release the assembly for operation when a playing disk is inserted in the machine, a plurality of electrical switches arranged to be actuated when the game is played in a certain manner, disk returning mechanism operable in response to actuation of said switches, said mechanism including a manually operable rack bar, a wheel rotatable thereby having a plurality of openings to receive disks, said wheel being rotatable in one direction through a fraction of a revolution whereby successive openings may receive disks, said wheel being rotatable in the opposite direction to emit the disks into an outlet passage, the extent of angular rotation of the wheel determining the amount of openings which receive disks and the number of disks that are emitted, a plurality of electro-magnets each arranged to be energized in response to actuation of a different combination of said switches, armatures associated with the magnets and each movable to a position to limit movement of the rack bar and thus determine the number of disks emitted, and circuit-opening switches to effect deenergization of said magnets when the rack bar nears the inner limit of its path.

8. Machine of the class described comprising a game playing assembly, a slider to receive a coin or a disk susceptible to magnetic attraction, said slider being movable upon reception of a coin or disk to release said assembly for operation, selector means movable in response to movement of the slider, said selector means including a part to receive a coin or disk from the slider and an electromagnet, said part being arranged to direct a coin to a coin receiving portion of the machine and magnetically to retain a disk until the part moves back to a normal position when the slider returns to its normal inoperative position, and means to deenergize the magnet as said part returns to its normal position, whereby the disk is released to another part of the machine.

9. A machine of the class described, comprising a casing, a game playing assembly, means to receive either a coin or a playing disk magnetically distinguishable from a coin, said means being movable upon reception of a coin or playing disk to release the game playing assembly for operation, selector means including a magnet effective to receive and direct a disk to one part of the casing and to receive and direct a coin to another part of the casing, playing disk-returning means arranged to receive disks thus directed by said selector means, a control means for said disk-returning means, said control means being operable in response to playing of the game in a certain manner thus to condition the disk-returning means for operation.

10. A machine of the class described, comprising a normally locked merchandise vending mechanism, a pin board game including a projector to impel balls over a pin board, a common casing for said mechanism and game, means controllable upon insertion of either a coin or disk to release balls for supply to said projector and thus permit playing of the game, disk-receiving means arranged to receive disks from said first-named means, a release device arranged to receive a coin from said first-named means and thereupon to unlock said vending mechanism, and a coin-receiving means to which coins are directed by said device.

11. A machine of the class described, comprising a normally locked mechandise vending mechanism, a pin board game including a projector to impel balls over a pin board, a common casing for said mechanism and game, means controllable upon insertion of either a coin or disk to release balls for supply to said projector and thus permit playing of the game, a disk dispensing mechanism arranged to receive disks from said first-named means, a release device arranged to receive a coin from said first-named means and thereupon to unlock said vending mechanism, and a coin-receiving means to which coins are directed by said device, said dispensing mechanism being operable in response to movement of balls to selected openings in the pin board.

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