E. J. ORNOLD.

COIN CONTROLLED MECHANISM.

APPLICATION FILED JULY 3, 1912.

1,077,293.

Patented Nov. 4, 1913.

3 SHEETS—SHEET 1.

Fig. 1

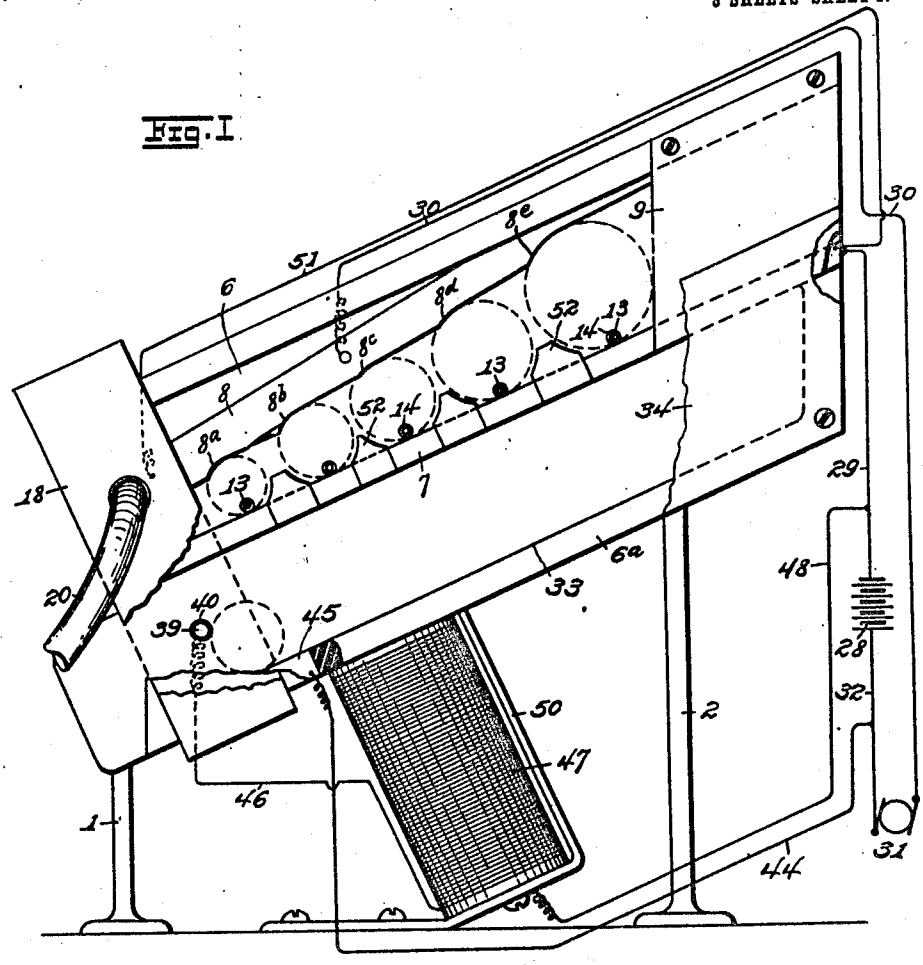
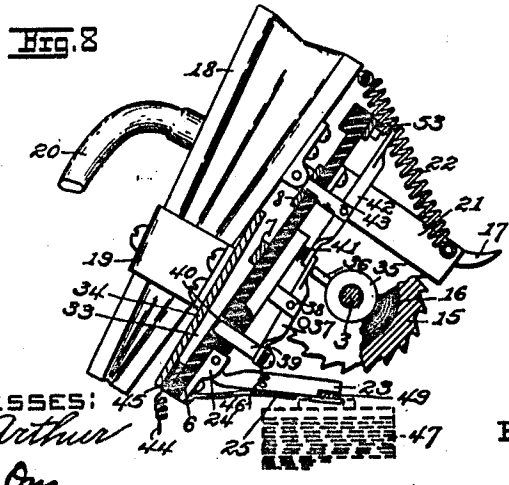


Fig. 8



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3 SHEETS—SHEET 2.

Fig. 2

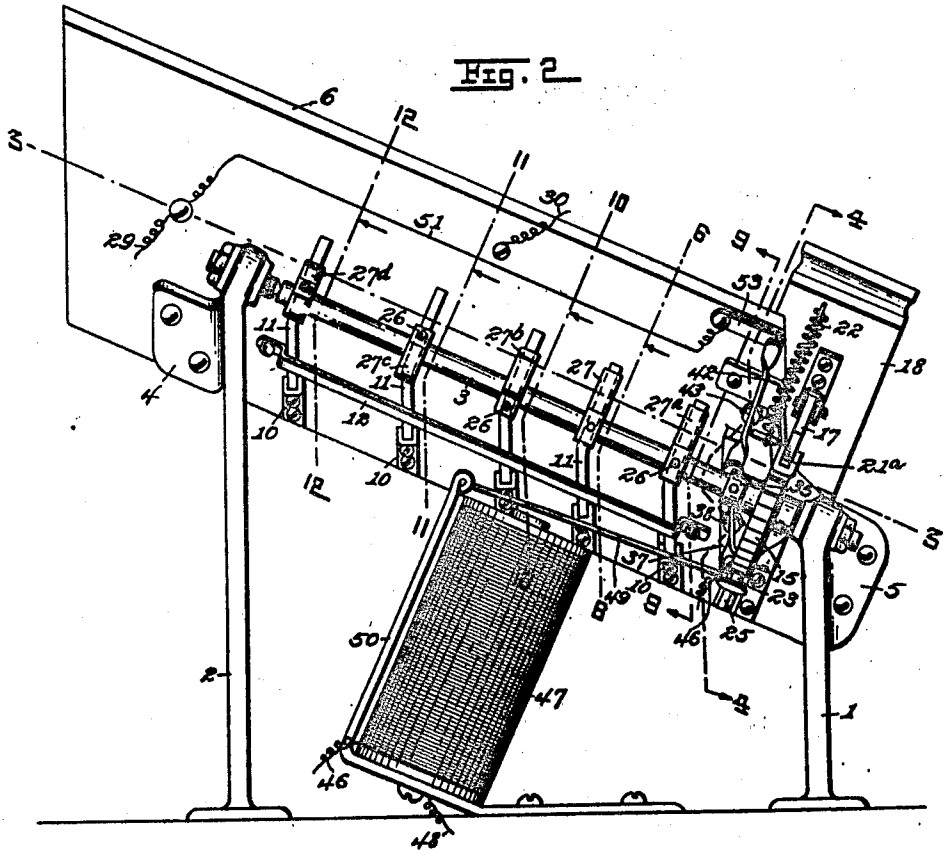
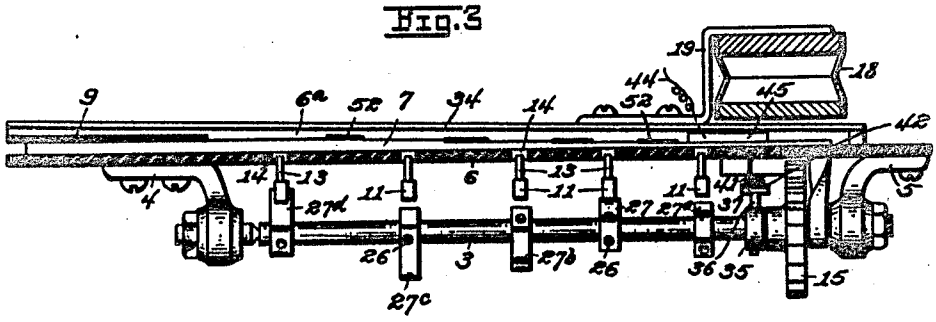


Fig. 3



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3 SHEETS—SHEET 3.

Fig. 4

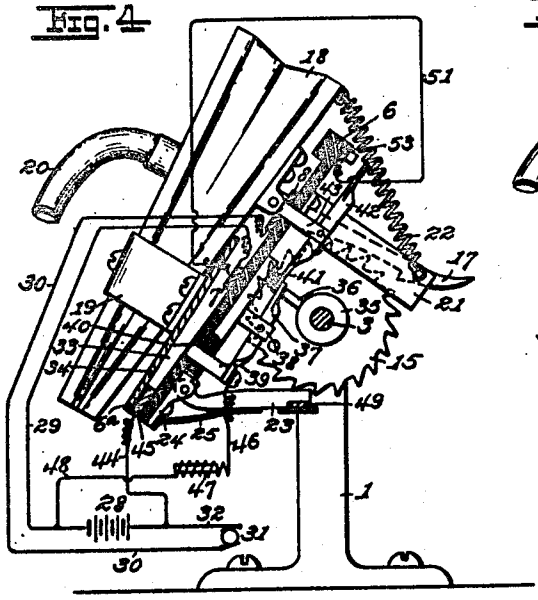


Fig. 5

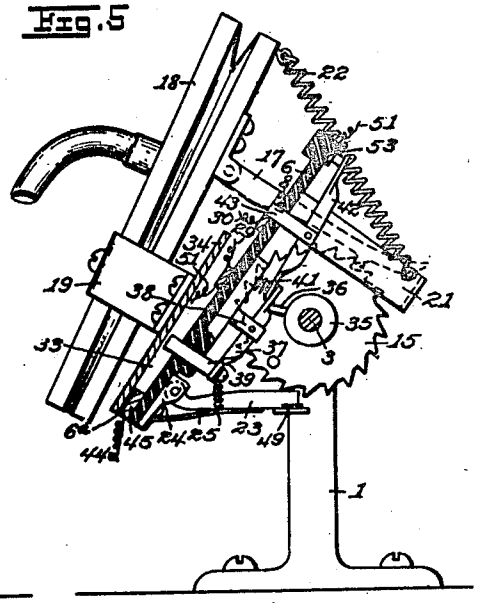


Fig. 6

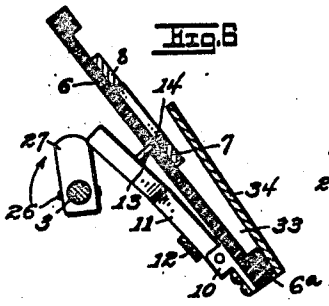


Fig. 7

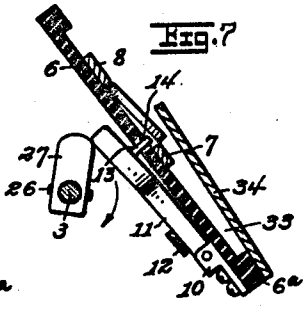


Fig. 9

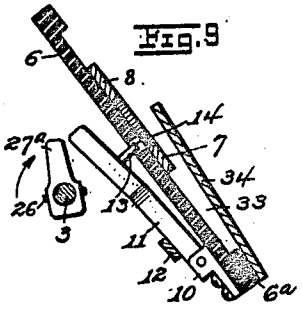


Fig. 12

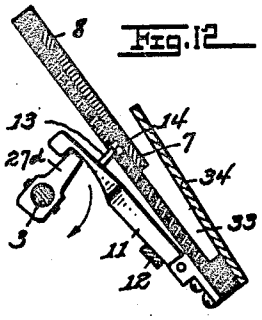


Fig. 11

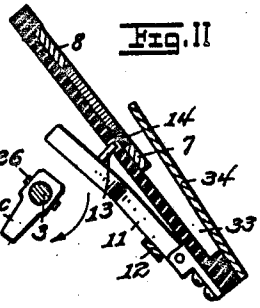
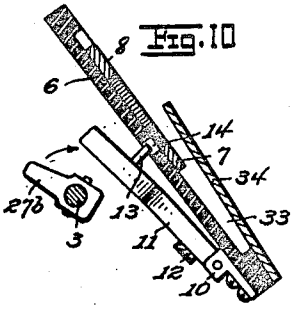


Fig. 10



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COIN-CONTROLLED MECHANISM.

1,077,293. Specification of Letters Patent. Patented Nov. 4, 1913.

Application filed July 3, 1912. Serial No. 707,445.

To all whom it may concern:

Be it known that I, EDWIN J. ORNOLD, a citizen of the United States of America, and resident of Wheeling, county of Ohio, and State of West Virginia, have invented certain new and useful Improvements in Coin-Controlled Mechanisms, of which the following is a specification.

This invention relates broadly to coin controlled apparatus, and specifically to a coin controlled device whereby the actuating mechanism of mechanically driven musical instruments and analogous structures is controlled.

The primary object of the invention is to provide a coin actuated apparatus adapted for containing a plurality of coins of varying sizes and denominations whereby the piano actuating mechanism is actuated to cause the piano to play one or a plurality of pieces or selections, or to play a single selection one or a plurality of times, according to the size and value of the coin or coins deposited in the apparatus.

A further object is to provide an apparatus of the character mentioned adapted for receiving coins of different sizes and values in any desired order, or without regard to precedence or succession, and which is actuated by deposited coins to actuate the piano actuating mechanism a number of times corresponding with the value of said coins.

Other objects within the contemplation of the invention will in part be apparent and in part be pointed out hereinafter.

The invention resides in the features of construction, arrangement of parts and combinations of elements which will hereinafter be exemplified, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a front elevation of the invention, portions of the face plate being shown broken away and the electric circuits being illustrated diagrammatically; Fig. 2 is a rear elevation of the same; Fig. 3 is a longitudinal section on the line 3—3, Fig. 2; Fig. 4 is a transverse section on the line 4—4, Fig. 2, showing the parts in normal position and diagrammatically illustrating the electric circuits; Fig. 5 is a similar section showing the parts advanced to coin dislodging position; Figs. 6 and 7 are partial sections taken on the line 6—6, Fig. 2, showing, respectively the normal and coin-dislodging positions of the nickel-ejector; Fig. 8 is a view somewhat similar to Fig. 4, showing the armature in engagement with the magnet and holding the ratchet locking pawl withdrawn; and Figs. 9, 10, 11 and 12 are views similar to Fig. 6, taken respectively on lines 9—9, 10—10, 11—11 and 12—12, Fig. 2.

Referring to said drawings, in which like designating characters distinguish like parts throughout the several views—1 and 2 indicate standards or supports having bearings wherein a shaft 3 is journaled in an inclined position. Mounted in front of said shaft, as upon lugs or plates 4 and 5 carried by said supports, is a plate 6 composed of fiber, hard rubber, or other suitable material non-conductive of electricity, and mounted against the face of said plate is a strip or bar 7 of metal, as copper, having high conductivity. Said strip or bar occupies an inclined position and constitutes the bottom of a coin chute the upper or top wall of which is constituted by a metal conductor-strip 8, also mounted against said plate 6, having a greater angle of inclination than said strip 7, said chute thus having a downwardly tapered formation, as is clearly shown in Fig. 1.

The plate 6 is inclined rearwardly from its bottom edge upward so that coins introduced in the chute will lie in an inclined position closely hugging the said plate 6. The receiving end of said chute is preferably inclosed, as by a small face-plate 9 of non-conductive material, so as to facilitate the insertion of the coins in properly inclined position.

The under or bottom edge of the metal strip 8 is preferably rendered irregular by the provision of stop-shoulders 8^a, 8^b, 8^c, 8^d, and 8^e against which the upper edges of a dime, nickel, quarter, half-dollar and dollar are respectively adapted to seat, as shown in dotted lines in Fig. 1, when introduced in the chute in the order named, said shoulders being so disposed that the progress of no coin other than that which it is designed to stop will thereby be interrupted.

Pivotally mounted, as upon lugs 10 fixed to the rear face of the plate 6, are the lower ends of a plurality of levers 11 which are normally held by the force of gravity in rearwardly inclined positions against a suitable support, as 12. Each of said levers has on its inner face a pin or stud 13 which

is adapted, when the lever is raised from its normal position, to be projected through an orifice 14 provided therefor in the plate 6, the various orifices being located above the level of the strip 7 and directly behind the positions occupied by the various coins when the latter are properly or sequentially positioned or seated.

Mounted on the shaft 3 adjacent to one of its ends is a ratchet wheel 15 having in its outer face a central circular recess in which is mounted a coil band tension spring 16 having its inner end attached to a fixed point (not shown) and its outer end attached to said ratchet, said spring acting to return said ratchet and said shaft to normal position when released after advance movement thereof. A pawl 17 overlies said ratchet, being pivotally connected to the movable leaf of a pneumatic or bellows 18 which has its stationary leaf rigidly supported, as upon a suitably mounted supporting bracket 19. A tube 20 leads from the tracker-board (not shown) of the piano playing mechanism to said bellows, so that, when a perforation provided for the purpose in the music roll at the end of each selection uncovers said tube, suction from the main chest will instantly collapse said bellows, as shown in Fig. 5, for drawing the pawl 17 forward. Said pawl is normally held out of engagement with the ratchet 15 by any appropriate means, as by a supporting lug 21^a carried by a suitably located arm 21; but, when advanced by the closing movement of the movable leaf of the bellows, said pawl drops into engagement with a tooth of said ratchet and rotates the latter forward the distance of one tooth. When the bellows is relieved of the suction which effected its collapse, the movable leaf thereof is instantly retracted, as by a retractile coil spring 22 connected at one end to said leaf and at its other end to a fixed point, as to the arm 21. A second pawl 33 is pivotally mounted at a suitable point, as on a lug 24 carried by the plate 6 on its rear face, and is normally held by a spring 25 in interlocking engagement with a tooth of said ratchet, preventing rearward rotation of the latter and of the shaft 3, which rotation the spring 16 tends to effect.

The shaft 3 has rigidly mounted thereon, as by means of pins or set-screws 26, a plurality of triggers or dogs herein designated 27, 27^a, 27^b, 27^c and 27^d, which are adapted to be carried by said shaft at certain predetermined points in its movement into elevating relation to the levers 11 for thrusting the pins or studs 13 thereof through the orifices 14 for dislodging coins seated in the chute—that is to say, for thrusting the lower edges of said coins from seating position on the strip 7.

When a coin is introduced in the chute, it travels downward along the inclined strip 7 until it lodges against, or is arrested by, one of the shoulders formed on the under side of the strip, whereupon it closes an electric circuit which comprises a battery 28, conductor 29, the contact strip 7 to which said conductor 29 is connected, the coin, contact strip 8, conductor 30 leading from said strip 8, a motor 31 and conductor 32 returning to the battery. The electric circuit being closed through the coin, the motor 31 actuates the musical instrument in the usual well-known manner. When the roll or sheet bearing the composition reaches its end, the perforation provided therein for the purpose, as hereinbefore mentioned, comes into register with a suitably located hole in the tracker-board of the instrument, exposing the end of the tube 20 to the action of the suction and permits the air to be exhausted from the bellows 18, causing the latter to collapse and actuating the ratchet to rotate forward the distance of one tooth, as hereinbefore described.

The dogs carried by the shaft 3 correspond in number with the levers 11 and each is so disposed on said shaft and is so associated with one of said levers that it will engage the rear face of and elevate the latter when the ratchet has been advanced a certain number of teeth, or a predetermined distance; thus, the dog 27 engages the nickel dislodging lever on the first advance movement of the ratchet and shaft, the dog 27^a engages the dime dislodging lever on the second movement, the dog 27^b the quarter lever on the fifth movement, the dog 27^c the half-dollar lever on the tenth movement, and the dog 27^d the dollar lever on the twentieth movement.

When the nose of a dog, in the advance movement of the latter, engages a lever 11, the latter is thereby elevated, thrusting the pin or stud 13 carried thereby through the adjacent orifice 14 such a distance as will push the lower edge of the coin from its seat on the contact strip 7, as is clearly shown in Fig. 7. The coin so dislodged drops into an inclined runway 33 of which the plate 6 constitutes one wall and a plate 34 an oppositely facing wall, said plate 34 having its lower edge connected to a forwardly directed inclined flange 6^a formed on said plate 6, said flange constituting the bottom of said runway.

Carried by a collar 35 on the shaft 3, or by a boss provided on the ratchet, is an arm 36, and disposed in the path of movement of said arm is one end of a lever 37 which is pivoted, as upon a post 38, at the rear of said plate 6. The opposite end of said lever carries an inwardly directed pin 39 which, in one position of the lever, is projected through an orifice 40 in said plate into or across said runway 33, constituting

a stop for arresting a coin as the latter rolls down said runway after being dislodged as hereinbefore described. When the shaft 3 occupies its normal position, the arm 36 is seated upon the end of said lever opposite that on which the pin 39 is carried and maintains said end inwardly pressed against the tension of a small coil spring 41, thus holding the pin 39 withdrawn from the runway, as shown in Figs. 4 and 8. But, a single advance movement of the shaft 3 suffices to remove said arm 36 from pressure exerting relation to the lever 37, and allows said lever, actuated by the spring 41, to project the pin 39 across the runway, as shown in Fig. 5. A second lever 42 is pivoted, as upon a post 43, and has one end underlying the spring-pressed end of the lever 37 so as to be also actuated on one side by the spring 41 and on the other by the arm 36, as is clearly shown in Figs. 4, 5 and 8. The opposite end of said lever 42 is held elevated by the arm 36 when the shaft 3 occupies its normal position, and is adapted, when said shaft is advanced a single movement, to seat upon a contact plate 53 provided at a suitable point, as upon the rear face of the plate 6.

When a coin is arrested in the runway by the pin 39, a magnetic circuit is established through said coin, said circuit comprising the battery 28, the conductor 32, a conductor 44 tapped in on said conductor 32 and leading to a contact plate 45 located in the bottom of the runway adjacent to the position of said pin 39, said contact plate 45, the coin, said pin 39, a conductor 46 leading from said pin to a suitably located electromagnet 47, a conductor 48 leading from said magnet and tapped in on the conductor 29, and said conductor 29 returning to the battery. The closing of said magnetic circuit energizes the magnet 47 which immediately attracts an armature 49 hinged at one end, as upon a suitable standard 50, and having its opposite end seated upon, or otherwise connected to, the pawl 23. Movement of said armature, actuated by the energized magnet, acts to withdraw said pawl 23 from interlocking engagement with the ratchet, permitting the latter, actuated by its spring 16, to return to normal position. This action returns the arm 36 into pressure exerting relation with the end of the lever 37, withdrawing the pin 39 from the runway and releasing the coin.

For preventing the formation of an arc which would burn or otherwise injure the coin at the moment it is dislodged or shifted from its seat, a circuit parallel to the main circuit is provided which reduces the current that passes through the coin to an extent which renders it non-injurious to the coin. Said parallel circuit comprises the battery 28, the conductor 29, the contact strip 7, a conductor 51 leading from said strip to the contact plate 53, the lever 42, the post 43 which is mounted at its inner end in contact strip 8, said strip 8, conductor 30, motor 31, and the conductor 32 returning to the battery. As is obvious, said parallel circuit is closed by the seating of an end of the lever 42 on the contact plate 53 at the instant that the dislodging mechanism acts to unseat the coin, and it is again broken when said mechanism resumes normal position.

As will be apparent from the foregoing, when a plurality of coins are deposited in the chute in order according to size, they will all occupy their respective positions, as indicated in dotted lines in Fig. 1. The main electric circuit being closed by the coins, the musical instrument will be operated to the end of the first selection, whereupon the nickel dislodging lever will be elevated and the nickel pushed from its seat and caused to drop into the inclined runway. Rolling down said runway, the nickel is arrested by the pin 39 which was thrust across its path at the instant that the dislodging lever was elevated, the advance movement of the shaft 3 having simultaneously effected the elevation of said lever and moved the arm 36 from pressure exerting relation to the spring-pressed end of the lever 37. When said coin is arrested, it closes the magnetic circuit, and this effects the release of the advanced ratchet, allowing the latter and the shaft 3 to be returned to normal position, retracting the pin 39 and releasing the nickel. In like manner the dime is dislodged after it has twice actuated the musical instrument, and so on until all the coins in the chute have been disposed of, each coin actuating the instrument to play the number of selections of which its value is a multiple of five, and each coin, before it is released from the runway, actuating the coin-dislodging mechanism to return to initial or normal position.

It will be noted that coins may be deposited in any, or haphazard, order. Thus, assuming, for instance, that a quarter, nickel, dime and nickel are introduced in the slot in the order named, the quarter will stop when it engages the shoulder 8^c, and the other coins will stop therebehind in their order of introduction, each being seated against the next coin in advance thereof. When the quarter is dislodged at the end of the fifth selection, the remaining coins will advance until the foremost nickel engages the shoulder 8^b. At the end of the next selection, said nickel will be dislodged and the dime and second nickel will advance to their respective proper positions. At the end of the next selection, said second nickel

will be dislodged. Then, at the end of the second succeeding selection the dime will be dislodged.

Guards 52 are preferably fixed upon the face of the contact strip 7 for confining the coins to said strip as they travel down the chute. Said guards are so arranged, however, as to be intermediate the position occupied by the various coins when properly seated, and are so shaped as not to interfere with designed dislodgment of said coins.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a coin chute adapted to accommodate therein a plurality of coins at a time, a plurality of coin seats formed in said chute, said seats varying in size to accommodate coins of different denominations, a motor circuit closed by a coin occupying seated position in said chute, a ratchet wheel, means for intermittently rotating said wheel, and means actuated by rotation of said wheel for successively dislodging coins in a sequence determined by their positions in the chute.

2. The combination of a coin chute adapted to accommodate therein a plurality of coins at a time, a plurality of coin seats formed in said chute, said seats varying in size to accommodate coins of different denominations, a motor circuit closed by a coin occupying seated position in said chute, a ratchet wheel, means for intermittently rotating said wheel, means actuated by rotation of said wheel for successively dislodging coins in a sequence determined by their positions in the chute, and means for returning said wheel to normal position.

3. The combination of a coin chute adapted to accommodate therein a plurality of coins at a time, a plurality of coin seats formed in said chute, said seats varying in size to accommodate coins of different denominations, a motor circuit closed by a coin occupying seated position in said chute, a ratchet wheel, means for intermittently rotating said wheel, means actuated by rotation of said wheel for successively dislodging coins in a sequence determined by their positions in the chute, and mean controlled by the dislodged coin for returning said wheel to normal position.

4. The combination of a coin chute having coin seats therein and adapted to accommodate a plurality of coins at a time, a motor circuit closed by a coin occupying seated position in said chute, a ratchet wheel, means for intermittently rotating said wheel, means actuated by rotation of said wheel for successively dislodging coins in a sequence determined by the positions which they occupy, a magnetic circuit closed by each coin after dislodgment, means under the control of said magnetic circuit for releasing the advanced wheel, and means for returning said wheel and the coin dislodging means to normal position.

5. The combination of a coin chute having a plurality of coin seats therein and adapted to accommodate a plurality of coins at a time, an electric circuit closed by a coin occupying seated position in said chute, means operating across the seating positions of said coins at predetermined intervals for successively dislodging the same in a sequence determined by their positions in the chute, and means actuated by a dislodged coin for returning the dislodging means to normal position.

6. The combination of a coin chute having coin seats of varying sizes therein and adapted to accommodate a plurality of coins at a time, an electric circuit closed by a coin occupying seated position in said chute, means operating across the seating positions of said coins at predetermined intervals for successively dislodging the same in a sequence determined by their positions in the chute, a magnetic circuit closed by a dislodged coin, and means actuated by the closed magnetic circuit for permitting the dislodging means to resume normal position.

7. The combination of a coin chute having coin seats of varying sizes therein and adapted to accommodate a plurality of coins at a time, an electric circuit closed by a coin occupying seated position in said chute, means operating across the seating positions of said coins at predetermined intervals for successively dislodging the same in a sequence determined by their positions in the chute, means for arresting a dislodged coin, and means actuated by the arrested coin for returning the dislodging means to normal position.

8. The combination of a coin chute having coin seats of varying sizes therein and adapted to accommodate a plurality of coins at a time, an electric circuit closed by a coin occupying seated position in said chute, means operating across the seating positions of said coins at predetermined intervals for successively dislodging the same in a sequence determined by their positions in the chute, means for arresting a dislodged coin, means actuated by the arrested coin for returning the dislodging means to normal position, and means actuated by the return of said dislodging means for releasing the arrested coin.

9. The combination of a coin chute having coin seats therein, an electric circuit closed by a coin occupying seated position in said chute, means operating across the seating positions of said coins at predetermined intervals for dislodging the same, means for arresting a dislodged coin, a magnetic circuit closed by the arrested coin, means actuated by the closed magnetic circuit for re-

leasing the dislodging means, and means for returning said dislodging means to normal position.

10. The combination of a coin chute having coin seats therein, an electric circuit closed by a coin occupying seated position in said chute, means operating across the seated positions of said coins at predetermined intervals for dislodging the same, means for arresting a dislodged coin, a magnetic circuit closed by the arrested coin, means actuated by the closed magnetic circuit for releasing the dislodging means, means for returning said dislodging means to normal position, and means actuated by the return of said dislodging means for releasing the coin.

11. The combination of a coin chute having a plurality of coin seats therein, a motor circuit closed by a coin resting in one of said seats, a shaft journaled to rotate adjacent to said chute, means for rotating said shaft a predetermined distance at predetermined intervals, a plurality of movable elements adapted to be projected into the chute for dislodging coins, a plurality of dogs carried by said shaft and arranged to actuate said elements at predetermined points in the rotation of the shaft, and means for returning said shaft to normal position as the coins are successively dislodged.

12. The combination of a coin chute having a plurality of coin seats therein, a motor circuit closed by a coin resting in one of said seats, a shaft journaled to rotate adjacent to said chute, means for rotating said shaft a predetermined distance at predetermined intervals, a plurality of movable elements adapted to be projected into the chute for dislodging coins, a plurality of dogs carried by said shaft and arranged to actuate said elements at predetermined points in the rotation of the shaft, and means actuated by each dislodged coin for returning said shaft to normal position.

13. The combination of a coin chute having a plurality of coin seats therein, a motor circuit closed by a coin resting in one of said seats, a shaft journaled to rotate adjacent to said chute, means for rotating said shaft a predetermined distance at predetermined intervals, a plurality of movable elements adapted to be projected into the chute for dislodging coins, a plurality of dogs carried by said shaft and arranged to actuate said elements at predetermined points in the rotation of the shaft, an electric circuit closed by each coin after its dislodgment, means actuated by the last mentioned circuit for releasing said shaft, and means for returning said shaft to normal position.

14. The combination of a coin chute having a plurality of coin seats therein, a motor circuit closed by a coin resting in one of said seats, a shaft journaled to rotate adjacent to said chute, means for rotating said shaft a predetermined distance at predetermined intervals, a plurality of movable elements adapted to be projected into the chute for dislodging coins, a plurality of dogs carried by said shaft and arranged to actuate said elements at predetermined points in the rotation of the shaft, means arresting each coin after its dislodgment, an electric circuit closed by the arrested coin, means actuated by the closed circuit to release the advanced shaft, and means for returning said shaft to normal position.

15. The combination of a coin chute having a plurality of coin seats therein, a motor circuit closed by a coin resting in one of said seats, a shaft journaled to rotate adjacent to said chute, means for rotating said shaft a predetermined distance at predetermined intervals, a plurality of movable elements adapted to be projected into the chute for dislodging coins, a plurality of dogs carried by said shaft and arranged to actuate said elements at predetermined points in the rotation of the shaft, means arresting each coin after its dislodgment, an electric circuit closed by the arrested coin, means actuated by the closed circuit to release the advanced shaft, means for returning said shaft to normal position, and means actuated by the return of said shaft to normal position for releasing the arrested coin.

16. The combination of a runway, a coin chute superposed over said runway and having coin stops therein, a motor circuit closed by a coin seated against one of said stops, members adapted to be projected across said chute at points adjacent to each stop to push a coin from its seat into said runway, means for actuating said members, means for arresting a coin in said runway, a magnetic circuit closed by an arrested coin, means actuated by the closed magnetic circuit for releasing the member-actuating means, and means for returning said actuating means to normal position.

17. The combination of a runway, a coin chute superposed over said runway and having coin stops therein, a motor circuit closed by a coin seated against one of said stops, members adapted to be projected across said chute at points adjacent to each stop to push a coin from its seat into said runway, means for actuating said members, means for arresting a coin in said runway, a magnetic circuit closed by an arrested coin, means actuated by the closed magnetic circuit for releasing the member-actuating means, means for returning said actuating means to normal position, and means actuated by the return of said actuating means for releasing the arrested coin.

18. The combination of a runway, a coin chute superposed over said runway and having coin stops therein, a motor circuit

closed by a coin seated against one of said stops, members adapted to be projected across said chute at points adjacent to each stop to push a coin from its seat into said runway, intermittently advanced means for actuating said members, means for arresting a coin in said runway, means actuated by an arrested coin for releasing the advanced actuating means, and means for returning said actuating means to normal position.

19. The combination of a runway, a coin chute superposed over said runway and having coin stops therein, a motor circuit closed by a coin seated against one of said stops, members adapted to be projected across said chute at points adjacent to each stop to push a coin from its seat into said runway, intermittently advanced means for actuating said members, means for arresting a coin in said runway, means actuated by an arrested coin for releasing the advanced actuating means, means for returning said actuating means to normal position, and means actuated by the return of said actuating means to normal position for releasing the arrested coin.

20. The combination of a runway, a coin chute superposed over said runway and having coin stops therein, a motor circuit closed by a coin seated against one of said stops, members adapted to be projected across said chute at points adjacent to each stop to push a coin from its seat into said runway, a movable coin-arresting pin adapted to operate across said runway, means whereby said pin is held retracted when the member-actuating means occupies normal position, means for advancing said pin on the first advance movement of said actuating means, means actuated by a coin arrested by said pin for releasing the advanced actuating means, and means for returning said actuating means to normal position.

21. The combination of a runway, a coin chute superposed over said runway and having coin stops therein, a motor circuit closed by a coin seated against one of said stops, members adapted to be projected across said chute at points adjacent to each stop to push a coin from its seat into said runway, a movable coin-arresting pin adapted to operate across said runway, means whereby said pin is held retracted when the member-actuating means occupies normal position, means for advancing said pin on the first advance movement of said actuating means, a magnetic circuit closed by a coin arrested by said pin, means actuated by said closed magnetic circuit for releasing the advanced actuating means, and means for returning said retracting means to normal position.

22. A coin controlled mechanism comprising a coin passage adapted to accommodate a plurality of coins of varying sizes at a time, a plurality of coin seats disposed in the path of travel of coins through said passage and progressively restricting said passage from the rear end forward whereby each of a plurality of coins introduced in increasing sequence as to size are permitted to assume a seated position, and means for successively dislodging sequentially seated coins in the order of their increasing values, said means also acting to first unseat the most advanced seated coin when a plurality of coins are non-sequentially introduced, and thus permit the advance to seating position of a small coin lodged therebehind.

In testimony whereof I affix my signature in presence of two subscribing witnesses.

EDWIN J. ORNOLD.

Witnesses:
H. E. DUNLAP,
L. D. MORRIS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."