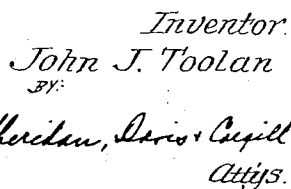


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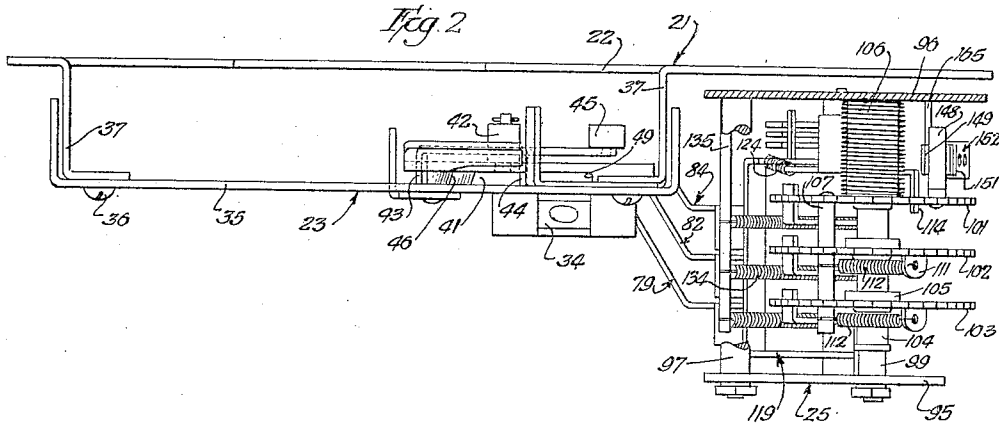
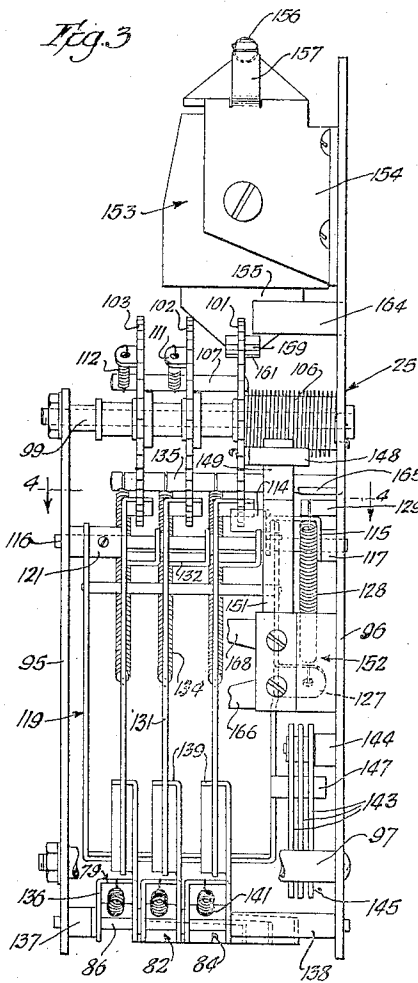
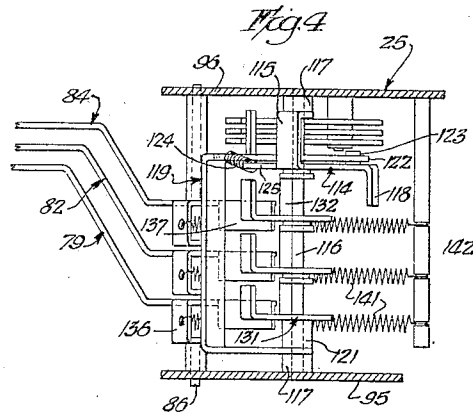
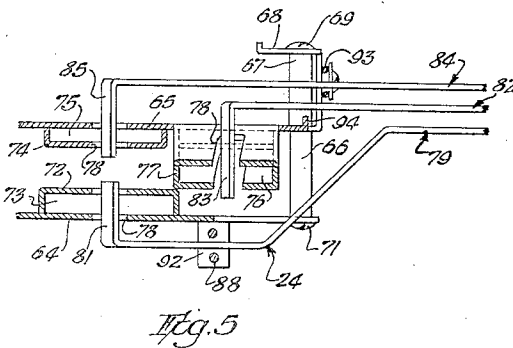
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2,435,933

COIN CONTROL AND CREDIT REGISTER MECHANISM

Filed Feb. 20, 1942

4 Sheets-Sheet 2



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COIN CONTROL AND CREDIT REGISTER MECHANISM

Filed Feb. 20, 1942

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Fig. 6

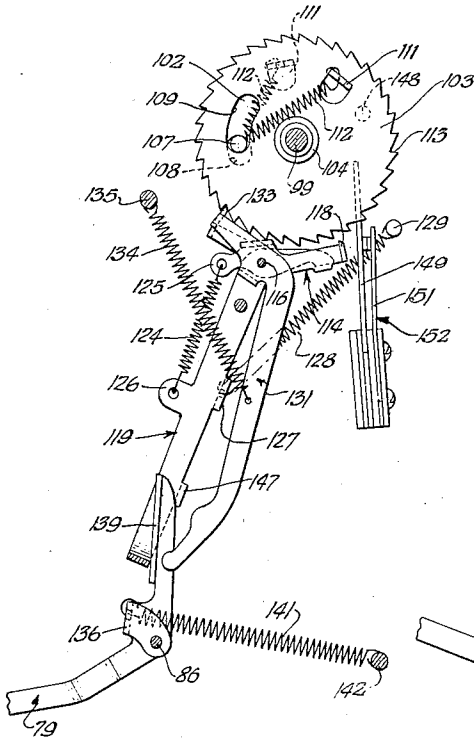


Fig. 7

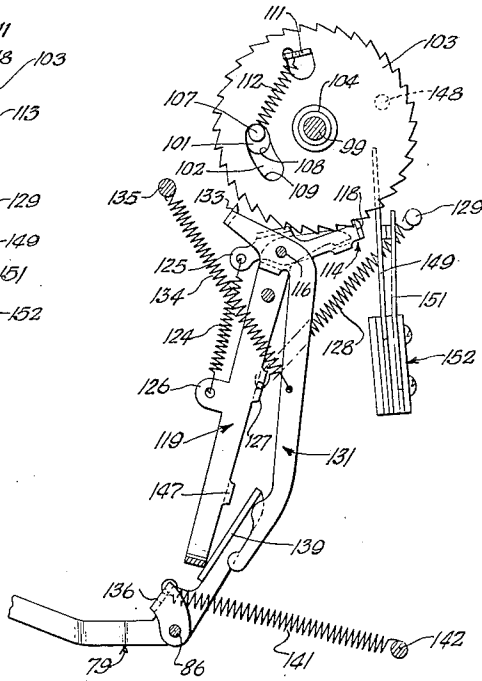


Fig. 8

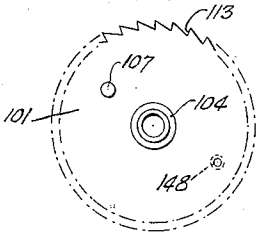


Fig. 9

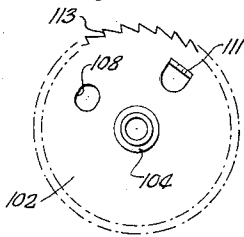


Fig. 10

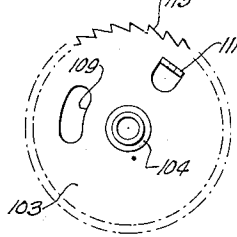


Fig. 11

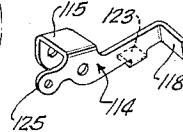


Fig. 12

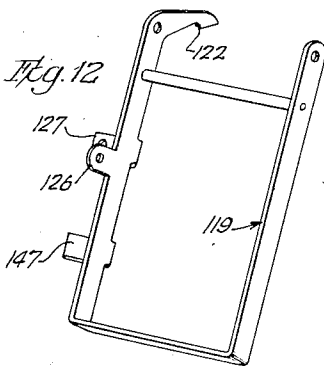


Fig. 13

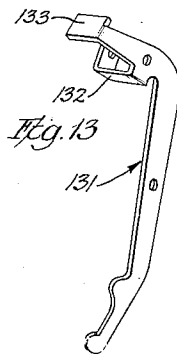
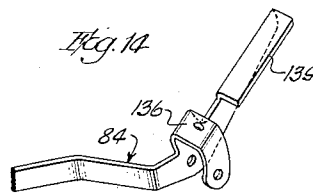


Fig. 14



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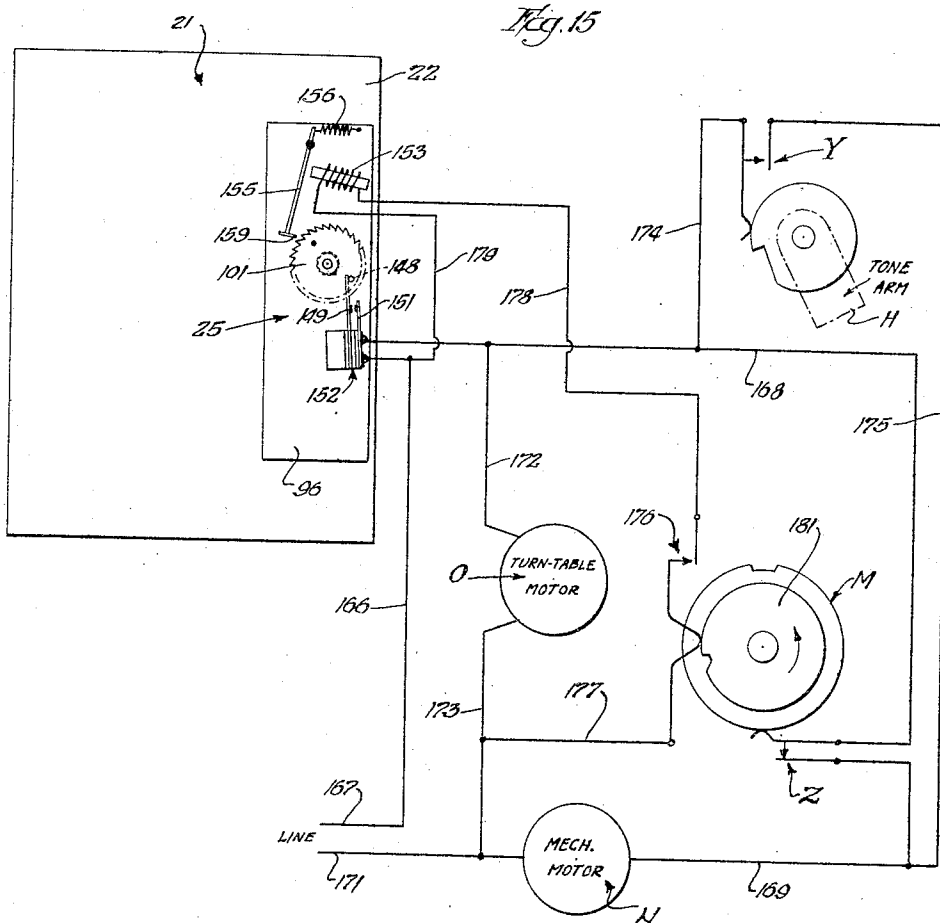
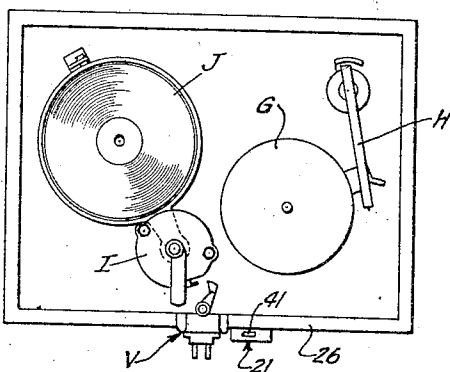
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COIN CONTROL AND CREDIT REGISTER MECHANISM

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UNITED STATES PATENT OFFICE

2,435,933

COIN CONTROL AND CREDIT REGISTER
MECHANISM

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Application February 20, 1942, Serial No. 431,623

5 Claims. (Cl. 194—9)

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This invention relates in general to coin control apparatus, and more particularly to novel registering means for accumulating the total value of one or more coins of different denominations, which may be employed specifically to determine the operative period or number of operations of any desired machine or mechanism, such as an automatic phonograph.

Prior art devices have been provided for this purpose, including some which effect operation of the controlled mechanism in accordance with the value of coins of different denominations, but these employ electrical means for transmitting the different values to other electrical means associated with the controlled mechanism in step-by-step operations, each such operation corresponding to a particular unit of value.

A principal object of the instant invention is to eliminate such electrical means by providing means for directly controlling the operative period or number of operations of a desired mechanism, which control means is operated, in response to the deposit of coins of different denominations, in single accumulative actions of different degrees corresponding respectively to the different denominational values of the deposited coins.

Another object of the invention is the provision of novel registering means which is selectively operable in single accumulative actions of different predetermined values, and is reversely operable for returning the same to zero or normal position in step-by-step actions of units value.

A further object of the invention is the provision of novel coin actuated control means for such registering means.

Another object of the invention is the provision of means automatically operable to prevent operation of such coin actuated control means by any extraneously applied force other than that afforded by the coins properly presented for operation thereof.

A further object of the invention is the provision, in combination with registering means adapted to be mounted for actuation in a certain position only, of means automatically operable to prevent operation of the registering means whenever the same is not disposed in such position.

Another object of the invention is the provision, in combination with a control unit including means for indicating the proper operative positioning thereof, of novel and simplified means for adjustably mounting the unit on a supporting

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structure to insure the proper operative positioning thereof as determined by the indicating means.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, when taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

In the drawings,

Figure 1 is a front elevational view of a complete unit embodying the features of the instant invention;

Fig. 2 is a top plan view of the device of Fig. 1 with parts broken away and other parts omitted;

Fig. 3 is an end elevation of the control and credit register or accumulator mechanism forming a part of the invention, as seen from the right side of Fig. 1;

Fig. 4 is a horizontal section taken substantially on the line 4—4 of Fig. 3;

Fig. 5 is a detail horizontal section taken substantially on the line 5—5 of Fig. 1;

Figs. 6 and 7 are detail vertical views showing the credit and control register mechanism in different positions of operation;

Figs. 8, 9 and 10 are detail elevations, respectively, of the three different register elements of the control and credit register or accumulator mechanism;

Fig. 11 is a perspective view of the latch pawl lever;

Fig. 12 is a perspective of the yoke or latch releasing lever;

Fig. 13 is a perspective view of one of the stop pawl levers;

Fig. 14 is a perspective of the right-hand portion of one of the coin actuated or register control levers;

Fig. 15 is a wiring diagram illustrating the electrical connections between one of the instant units and an automatic phonograph or other mechanism controlled thereby; and

Fig. 16 is a diagrammatic plan view of an automatic phonograph embodying the unit of the present invention.

Referring more particularly to the drawings, the embodiment of the invention disclosed therein constitutes a coin control and credit register mechanism designated generally by reference numeral 21 which comprises a backing or main supporting plate member 22 upon which are separately mounted in predetermined rela-

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tive relationship a coin handling mechanism or coin deposit means 23, an auxiliary coin receiving or guiding mechanism 24, and a control and credit register or accumulator generally indicated by reference numeral 25. The unit 21 as a whole is adapted to be mounted in operative position upon any desired supporting structure 26 which may comprise the usual outer cabinet of an automatic phonograph or other suitable machine, as shown in the diagrammatic illustration of Fig. 16, or may be located remote from the machine, which is to be controlled thereby. Since it is essential to the proper operation of the coin handling mechanism or coin deposit means 23 that the same be accurately maintained in true vertical position, the following novel means are provided for adjustably mounting the backing plate 22 on the supporting structure 26.

A horizontally disposed screw or bolt 27 (Fig. 1) functioning as a main pivotal support for the backing plate 22 extends therethrough into the supporting structure 26. A second screw or bolt 28, which extends through a suitable slot 29 in the backing plate 22 and into the supporting structure 26, functions to rigidly retain the unit 21 in properly adjusted or operative position on the stationary supporting structure. Adjustment of the unit 21 relative to the supporting structure 26 about the pivotal supporting bolt 27 is accurately accomplished by a screw 31 extending through a suitable tapped aperture in a flange 32 of the backing plate 22 and contacting a lug 33 provided on the supporting structure 26. Determination of the correct vertical positioning of the unit 21 is had from an indicating means or level 34 rigidly secured to the front plate of the coin handling mechanism 23.

The purposes and functions of the coin handling mechanism or coin deposit means 23 are to receive coins of different denominations, such as nickels, dimes and quarters, guide and direct genuine coins of such denominations through different paths of movement therethrough, and return or reject spurious or counterfeit coins, so as to present each genuine deposited coin of a particular denomination at a special operative delivery station. It will be understood that any coin handling device capable of so operating will function properly in cooperation with the instant auxiliary coin receiving and guiding mechanism 24 and the control and credit register or accumulator 25. Consequently, the coin handling mechanism or coin deposit means 23 employed in the present embodiment of the invention is one well known and commercially available, so that the same is illustrated more or less diagrammatically in Figs. 1 and 2 and will be described only in sufficient detail to afford to anyone skilled in the art a clear understanding of its functions, particularly in cooperation with the remaining elements of the present invention.

Briefly, the operative parts of the coin handling mechanism or coin deposit unit 23 are mounted upon a front plate 35 (Figs. 1 and 2) which is secured at its upper end by screws 36 to brackets 37 bent forwardly from the backing plate 22. The lower end of the unit 23 is held in proper position on the backing plate 22 by a stud screw 38 secured to a rearwardly extending flange of the front plate 35, which screw engages in a suitable slot provided in a forwardly extending flange 39 struck from the plate 22. Coins may be deposited in the unit 23 through a suitable slot or aperture 41 at the upper end thereof (Figs. 2 and 16) which is sufficiently wide to

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accommodate coins up to and including the size of a quarter.

Rotatably mounted below the slot 41 (Figs. 1 and 2) is a selector device 42 having two arms provided, respectively, with forwardly extending flanges or lips 43 and 44, and a third arm with a weight 45 thereon (Fig. 2). The lips 43 and 44 extend forwardly across the entire width of the slot 41 and are normally retained in their positions of the drawings adjacent the ends of the slot by the weight 45. When a coin of smaller diameter than a quarter is dropped into the slot 41, it will pass downwardly between the lips or flanges 43 and 44 to strike the right-hand sloping surface of a buffer block or lug 46 disposed below the slot 41 and be deflected laterally to the right therefrom. When a quarter is dropped in the slot, however, it will be engaged by the lips 43 and 44, in the manner illustrated in broken lines in Fig. 1, whereupon the weight of the coin resting upon the lip 43 will rotate the sorter 42 counter-clockwise against the action of the weight 45. As the lip 43 is thus rotated to a position adjacent the lug 46, the quarter will fall from the selector 42 and be directed toward the left of the lug 46 and through a path represented by the broken line 47 in Fig. 1 to a delivery station 48 at the forward left-hand corner of the unit 23.

The dimes and nickels disposed in the slot 41, which do not effect any operation of the selector device 42, are directed along different paths of movement, respectively, through the unit 23 in the following manner: A deflector plate or anvil 49 (Figs. 1 and 2) is disposed behind the front plate 35 to the right of the lug 46 and is so shaped and spaced therefrom that it will be struck by nickels deflected by the lug 46, while dimes deflected by lug 46 will clear or fall under this deflector plate 49. Consequently, the times will take the path represented by the broken line 51 in Fig. 1 and be directed by suitable guide means to a delivery station 52 spaced to the right and to the rear of the quarter delivery station 48. The nickels, on the other hand, are deflected by the plate 49 to following a path through the unit represented by the broken line 53, with the aid of suitable guide means including another deflector plate or anvil 54, and are directed to a delivery station at the lower left-hand corner of the unit behind the delivery station 48 and spaced rearwardly of the dime delivery station 52.

Means of well-known character are provided in the unit 23 for preventing the arrival at the different genuine coin delivery stations of any spurious or counterfeit coins, slugs or the like, which are disposed in the slot 41. This means, as illustrated in Fig. 1, includes the anvils or buffer blocks 46, 49 and 54, which function in the usual manner to cause spurious coins to be deflected to greater or lesser degrees of movement than genuine coins; magnets 55, 56 and 57, which set up localized magnetic fields of high concentration in the paths of movement of the quarter (47), nickels (53) and dimes (51), respectively, to discriminate between genuine coins and spurious coins or slugs having similar electrical properties; a feeler 58; and suitable scavenger or ejecting mechanism including an actuating lever 59 and a clearing finger 61, for ejecting spurious coins and directing the same, as is done by the aforementioned anvils, magnets, etc., into a rejected coin chute or delivery station 62. Similar fraud preventing mechanism for coin de-

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posit means or coin handling apparatus is disclosed in United States Letters Patent No. 2,064,425, No. 2,073,260, and No. 2,073,261, issued to John Gottfried. The rejected coin delivery station 62 communicates at its lower end with a suitable return chute 63. The coin handling mechanism or coin deposit means 23 thus functions to automatically guide all genuine coins of different denominations which are deposited in the slot 41 to their respective delivery stations, i. e., the quarter delivery station 48, the nickel delivery station located to the rear thereof or the dime delivery station 52, and to reject all spurious or counterfeit coins deposited in the slot 41 and direct the same into the return chute 63.

As previously stated, the specific manner of accomplishing this desired result of delivering genuine coins to different points in accordance with their denominational value, and preventing the delivery at such points of spurious or counterfeit coins, is a part of the present invention only so far as the accomplishment of this function is concerned. In other words, any coin handling or coin deposit means which will accomplish this result is adaptable for use with the following elements of the present unit.

The auxiliary coin receiving and guiding mechanism 24 comprises a separate unit rigidly mounted upon the backing plate 22 below the coin handling unit 23 and so positioned relative thereto as to cooperate with the previously described coin delivery stations. The unit 24 (Figs. 1 and 5) comprises a front plate 64 and a rear plate 65 secured together and to the backing plate 22 in spaced relationship to each other and to said backing plate in the following manner. Between each of the plates 64 and 65 are disposed a plurality of spacing members or sleeves 66 (Fig. 5), with each one of which is axially aligned an internally threaded spacer or tapped sleeve 67 in turn interposed between the rear plate 65 and a flange 68 struck forwardly from the main supporting plate 22. A screw 69 extends through a suitable aperture in each of the flanges 68 and is screwed into the associated tapped sleeve 67 to secure the latter to the backing plate 22. Similarly, bolts 71 extend through suitable apertures in the plates 64 and 65 and through each of the sleeves 66 for threaded engagement with the respective tapped sleeves 67 to secure the plates 64 and 65 thereto. The relative arrangement of these several retaining means is best illustrated in Fig. 1. A U-shaped channel member 72 is secured in any suitable manner to the rear surface of the front plate 64 to provide a coin receiving and guiding slot 73. Disposed rearwardly of the channel member 72 is a similar U-shaped channel member 74 which is secured in any desired manner to the front surface of the rear plate 65 to provide another coin receiving and guiding slot 75. A third coin receiving and guiding slot 76 is provided to the right of the coin slot 75 by means of another U-shaped channel member 77 similarly secured to the forward surface of the rear plate 65. As illustrated in Fig. 5, the upper end of the coin slot 76 is disposed between the coin slots 73 and 75, while its lower end is longitudinally aligned with the slot 75 by virtue of the upper end of the channel member 77 and that portion of the rear plate 65 associated therewith being bent forwardly from their normal planes.

The above described arrangement of the auxiliary coin receiving or guiding mechanism 24 is such that the upper ends of the several coin slots 73, 75 and 76 are disposed directly below and in

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vertical alignment with the quarter delivery station 48, the nickel delivery station, and the dime delivery station 52, respectively, of the coin handling unit 23. Consequently, any genuine coins deposited in the receiving slot 41 of the unit 23 will be delivered thereby to the proper slots 73, 75 and 76, depending upon the denominational value of the respective coins. Means are provided in association with each of the coin slots 73, 75 and 76 for controlling operation of the control and credit register or accumulator unit 25. In each instance, this control means comprises a lever having an end portion extending transversely of the coin slot to be actuated by any coin passing downwardly therethrough, and these levers, although forming an integral part of the accumulator unit 25, will now be described in conjunction with their operation as determined by the coins delivered to the auxiliary coin receiving or guiding mechanism 24.

The front and rear walls of the several members forming the coin slots 73, 75 and 76 are each provided with arcuately shaped apertures 78. The left-hand end portion of a longitudinally extending lever 79 is bent forwardly as best illustrated in Fig. 5 to clear the front plate 64, and terminates in a rearwardly extending portion 81 which passes through the arcuate slots 78 provided in the front plate 64 and channel 72. The end 81 of the lever 79 thus extends from front to rear across the quarter receiving slot 73 of the unit 24. The left end of a similar lever 82, which extends longitudinally adjacent the rear surface of the rear plate 65, terminates in a forwardly bent portion 83 passing through the apertures 78 associated with the dime receiving slot 76 to traverse the latter. Similarly, the left end of a third lever 84 terminates in a forwardly extending portion 85 which extends through the apertures 78 communicating with the nickel receiving slot 75. Each of the levers 79, 82 and 84 is pivotally mounted intermediate its ends on a horizontal shaft 86 provided in the accumulator unit 25 (Figs. 1 and 4) in a manner to be later more fully described. Whenever a quarter, dime or nickel is delivered to the auxiliary coin receiving or guiding mechanism 24, it will pass downwardly through its respective slot 73, 76 or 75 to strike the bent end portion 81, 83 or 85 of the associated lever 79, 82 or 84 to carry the same downwardly, as permitted by the arcuate slots or apertures 78. The left-hand end wall of each of the coin slots 73, 75 and 76 is cut away at its lower end for a substantial distance, as indicated at 87 in Fig. 1, to permit any coin passing downwardly through the slot and carrying the left end of the associated lever 79, 82 or 84 therewith to clear such lever and fall downwardly through the lower open end of the slot. After any such operation, the coin actuated levers or register control levers 79, 82 and 84 are returned to their normal or uppermost position of Fig. 1 by springs which will later be more fully described.

Means are provided for insuring maintenance of the bent end portions of the levers 79, 82 and 84 in proper registry with their respective coin receiving slots 73, 76 and 75 and for guiding such coin actuated pivotal movement of the levers. In the case of the quarter actuated lever 79, this means comprises a vertically disposed U-shaped wire 88 (Figs. 1 and 5), the leg portions of which are disposed respectively in front and in back of the lever 79 and spaced a short distance therefrom. The upper bent portion of the wire 88 is secured to a for-

wardly extending flange 89, which is struck from the front plate 64 (Fig. 1), by a screw 91, while the lower ends of the wire extend downwardly through suitable apertures provided in a horizontal flange 92 extending forwardly from the front plate 64. A similar U-shaped wire 93 (Figs. 1 and 5) is provided as a guide means for the nickel actuated lever 84. The dime actuated lever 82 extends in spaced relationship between the forward leg portion of the wire 93 and a rearwardly bent flange 94 of the rear plate 65 to be guided thereby. It should be noted in passing that any spurious coins, slugs, or the like, rejected by the coin handling or coin deposit unit 23 will be incapable of actuating any of the register control levers 79, 82 or 84, because the return chute 63 into which the same are ejected extends past and below the levers, as shown in Fig. 1.

The control and credit register or accumulator 25 comprises a separate unit mounted between front and rear plates 95 and 96 (Figs. 2 to 4), which are secured together in parallel spaced relationship by suitable spacer bolts 97. The rear plate 96 is secured to forwardly bent portions of the main backing plate 22 by screws 98, or the like, (Fig. 1) so as to maintain the unit 25 in proper vertical position thereon and to insure accurate disposition of the left-hand bent end portions of the coin actuated levers 79, 82 and 84 in their respective coin receiving slots 73, 76 and 75.

Extending between the front and rear plates 95 and 96 and rigidly secured thereto is a shaft 99 (Figs. 1, 2 and 3) upon which are rotatably mounted three register elements or wheels 101, 102 and 103. The wheels 101, 102 and 103 together comprise the accumulator of the unit 25, and are each provided with a forwardly extending hub portion 104 which, together with suitable collars 105 that are secured to the shaft 99, retain the wheels in spaced relationship relative to each other on the shaft. An accumulator actuator in the form of a coil spring 106 (Figs. 2 and 3) encircles the rear end of the shaft 99 and is secured in any suitable manner at its forward end to the register wheel 101 and at its rear end to the rear plate 96. The spring 106 is adapted to impart positive accumulative movements or increments of rotation to the register wheel 101 in a counter-clockwise direction, viewing Figs. 1 and 2, in a manner and under control of mechanism to be later more fully described.

The register element or wheel 101, which will hereinafter be referred to as the units wheel, has a forwardly extending rod or pin 107 rigidly secured at its rear end thereto to extend parallel with the shaft 99. The second register element or wheel 102 is provided with an aperture 108 (Fig. 9) through which the pin 107 extends, the aperture being longer by a predetermined amount than the diameter of the pin 107 to permit relative rotative movement on the shaft 99 between the register wheels 101 and 102, for a purpose to be later more fully explained. A similar arcuate aperture 109 is provided in the third register wheel 103 (Fig. 10), which is longer by a predetermined amount than the aperture 108 in the wheel 102 and through which the pin 107 of the units wheel 101 also extends. Each of the second and third register wheels 102 and 103 is provided with a forwardly extending lug or flange 111 struck from the main body portion thereof. One end of a coil spring 112 is secured to each of the flanges 111, and the opposite ends of these springs are secured to the pin 107. As best seen

in Fig. 1, the springs 112 function to normally resiliently retain the second and third register wheels 102 and 103 with the upper ends of their slots or apertures 108 and 109 in engagement with the pin 107 of the units register wheel. These several members 107 to 112, inclusive, constitute interconnecting means between the register wheels 101, 102 and 103 for permitting relative rotation between the units wheel and each successive one of said other wheels in different degrees corresponding respectively with predetermined multiples of a single degree of actuation representing a minimum value.

Means are provided for normally restraining the units register wheel 101 against positive actuation or counter-clockwise rotation by the spring 106. This means comprises ratchet teeth 113 provided on the periphery of the register wheel 101, and a latch pawl lever 114 which is shown alone in perspective in Fig. 11. The latch pawl lever 114 is formed intermediate its ends with a bifurcated hub portion 115 having suitable aligned apertures for rotatably mounting the same upon a shaft 116 extending between the front and rear plates 95 and 96 (Figs. 1, 3 and 4). As best seen in Figs. 3 and 4, the shaft 116 has a pair of collars 117 secured thereto adjacent its end portions which are disposed in engagement with the front and rear plates 95 and 96 to retain the shaft therebetween. The rear wing of the hub portion 115 of the latch pawl lever 114 engages the rear collar 117. The right-hand end of the latch pawl lever 114 terminates in a forwardly extending flange or shoulder 118 (Figs. 4 and 11) for engagement with the ratchet teeth 113 of the units register wheel 101.

A yoke or latch releasing lever 119, which is shown alone in perspective in Fig. 12, is rotatably mounted at its upper ends on the horizontal shaft 116 in the manner illustrated in Figs. 1, 3 and 4, with its rear leg disposed between the parallel portions of the bifurcated hub of the latch pawl lever 114, and its forward end held loosely against the forward collar 117 by a retaining collar 121 secured to the shaft 116. The upper end of the rear leg of the yoke 119 terminates in a bent portion 122 extending angularly to the right therefrom. The end of this bent portion 122, as best seen in Fig. 4, overlies a rearwardly extending shelf 123 formed integrally with the latch pawl lever 114 and disposed intermediate the hub portion 115 and the flange 118 of the latter (Fig. 11). The shelf 123 is held in yielding engagement with the lower end surface of the bent portion 122 by a coil spring 124 (Figs. 1, 6 and 7), the upper end of which is secured to the left-hand end 125 (Fig. 11) of the latch pawl lever 114, with the lower end of the spring secured to a protuberance 126 (Fig. 12) provided on the rear leg of the yoke or latch releasing lever 119. Adjacent the protuberance 126 on the rear leg of the yoke 119 and extending rearwardly therefrom is a protuberance 127 (Fig. 12) to which the lower end of a coil spring 128 is secured (Figs. 1, 3, 6 and 7). The upper end of the spring 128 is anchored by a stud 129 secured to the rear frame member 96. As best seen from Figs. 1 and 7, the springs 124 and 128 normally function to yieldingly maintain the latch pawl lever 114 in active engagement with the teeth 113 of the units register wheel 101, thus preventing positive rotation of this wheel by the register actuating means or spring 106.

Also rotatably mounted upon the horizontal shaft 116, together with the latch pawl lever 114 and yoke 119, are three stop pawl levers 131 which

are spaced along the shaft to cooperate respectively with the three register wheels 101, 102 and 103. As seen best in Fig. 13, each of these stop pawl levers 131, all three of which are identical, is provided adjacent its upper end with a bifurcated bearing or hub portion 132 having suitable aligned apertures for engagement of the shaft 116. The hub portions 132 of the stop pawl levers 131 are of such a width as to fill the space on the shaft 116 between the retaining collar 121 and the main portion of the latch pawl lever 114, together with suitable spacing washers disposed therebetween (Figs. 3 and 4). The upper end of each of the stop pawl levers 131 extends at an angle upwardly from the shaft 116 and terminates in a rearwardly disposed shelf 133 adapted to engage the teeth 113 of the associated register wheel. Coil springs 134 (Figs. 2, 3, 6 and 7) are attached at their lower ends intermediate the ends of each one of the stop pawl levers 131 and at their upper ends to a pin 135 secured to and extending forwardly from the rear frame plate 96. The shelf portion 133 of each of the stop pawl levers 131 is normally held out of engagement with the teeth 113 of the associated register wheels in a manner to be later described, as shown in Figs. 1 and 7, and each spring 134 is adapted to swing its stop pawl lever 131 in a clockwise direction about the shaft 116 to engage the shelf 133 with the teeth of the associated register wheel as illustrated in Fig. 6.

The right-hand end portions of each of the coin actuated register control levers 79, 82 and 84 are identical and include a bifurcated hub portion 136 having suitable aligned apertures in the leg portions thereof for rotatably engaging the shaft 86. As best seen in Fig. 3, these hub portions 136 of the coin actuated levers 79, 82 and 84 are maintained in proper spaced relationship relative to each other on the shaft 86 by suitable retaining collars 137 and 138 together with spacing washers interposed therebetween. The right-hand end of each of the coin actuated register control levers 79, 82 and 84 extends upwardly and rearwardly from the shaft 86 and includes a forwardly bent construction of the right-hand portion of each of these levers 79, 82 and 84, the latter being shown therein. The shelf portions 139 of the several levers 79, 82 and 84 are disposed in cooperative relationship respectively with the lower ends of the several stop pawl levers 131 (Fig. 3). A coil spring 141 (Figs. 1, 3, 4, 6 and 7) is connected at its left-hand end to the transverse part of each of the hub portions 136 of the several levers 79, 82 and 84 and at the right-hand end to a rod 142 extending forwardly from and secured to the rear frame plate 96. The springs 141 normally maintain the coin actuated register control levers 79, 82 and 84 in their normal position of rest of Figs. 1 and 7, wherein the left-hand bent end portions of the levers are disposed adjacent the top of their associated coin receiving slots 73, 76 and 75. The springs 141 in resiliently maintaining such normal position also function, through the agency of the shelf portions 139 of the levers, to maintain the three stop pawl levers 131 in their inactive position of Figs. 1 and 7 in which the upper ends thereof are out of engagement with the teeth 113 of the several register wheels 101, 102 and 103. The shelf portions 139 of the levers 79, 82 and 84 also lie to the right of and in engagement with the lowermost transverse portion of the yoke or latch releasing lever 119.

Operation of the above described mechanism

of the control and credit register or accumulator 25 in response to the deposit of genuine coins of different denominational values in the slot 41 of the coin handling unit 23 is as follows. If a nickel is deposited in the slot 41, it will be delivered to the slot 75 of the auxiliary coin receiving or guiding mechanism 24 in the manner previously described to swing the control lever 84 in a counter-clockwise direction about the shaft 86. Such swinging of the lever 84 will result in the shelf portion 139 at the right-hand end thereof being moved to the left away from the lower end of the associated stop pawl lever 131 to permit its spring 134 to swing the same in a clockwise direction about the shaft 116 to engage the shoulder 133 thereof with the periphery of the units register wheel 101. At the same time, the shelf portion 139 of the lever 84 will swing the yoke lever 119 from its position of Fig. 7 to its position of Fig. 6 against the action of the spring 128. Such swinging of the yoke lever 119 will carry the shoulder 118 of the latch pawl lever 114 out of engagement with the units register wheel 101. The spacing of the teeth 113 and of the shoulders 118 and 133 are such that the latter operate as an escapement to permit rotation of the units register wheel 101 by the actuating spring 106 positively or in a counter-clockwise direction for a distance equal to one unit, or that obtaining between adjacent teeth 113. In other words, downward movement of the left end of the control lever 84 first causes engagement of the associated shelf 133 with the peripheral face of one of the teeth 113 before the shoulder 118 of the latch pawl lever 114 is moved to release position to permit a partial rotation of the register wheel by the spring 106. This partial rotation will be less than the space of one tooth 113 but sufficient to move the radial surface of the tooth previously engaged by the shoulder 118 past the latter, and will be terminated by engagement with the shoulder 133 of the radial surface of the tooth 113 associated therewith. Subsequent return of the lever 84 to the normal position of Figs. 1 and 7 by its spring 141 then permits re-engagement of the latch pawl lever 114 with the units register wheel 101 by the springs 124 and 128 and disengagement of the shoulder 133 of the associated stop pawl lever 131 from the register wheel by the action of the spring 141 overcoming that of the spring 134. The spring 106 is thus enabled to complete the positive unit of actuation imparted to the register wheel 101 by continuing the movement of the same to engage the radial face of the next tooth 113 with the shoulder 118 of the latch pawl lever 114. The accumulator of the control and credit register unit 25, comprising the wheels 101, 102 and 103, thus has positive actuation of one unit value imparted thereto by the spring 106 under the control of the latch pawl lever 114 and the associated stop pawl lever 131 each time that the control lever 84 is moved downwardly by a genuine nickel and returned to normal position by its spring 141. Since the stop pawl levers 131 associated with the register wheels 102 and 103 are normally retained in inactive position, such actuation of the units register wheel 101 will be accompanied by similar rotation of the wheels 102 and 103 through an increment equal to a single unit of value by virtue of the pin 107 moving with the wheel 101 and the springs 112 maintaining the upper ends of the aperture 108 and 109 in engagement there-with.

Similar actuation of the register control lever 82 by a genuine dime deposited in the slot 41 will result in positive actuation of the several register wheels 101, 102 and 103 equal to twice the degree of rotation thereof resulting from operation of the control register 84 in the following manner. The control lever 82 operates or causes operation of the latch pawl lever 114 and the stop pawl lever 131 associated with the second register wheel 102 in exactly the same manner as previously described relative to operation of the control lever 84. In other words, operation of the control lever 82 permits rotation of the second register wheel 102 through only a single unit of rotation. At the same time, however, it is only counter-clockwise rotation of the second register wheel 102 which is thus limited to an increment equal to a single unit of value, and the latch pawl lever 114 is released from the units register wheel 101 in the previously described manner by depression of the left end of the control lever 82. The units register wheel 101 is thus free to be rotated by the actuating spring 106 through a greater degree, unless otherwise prevented. Its degree of rotation under these circumstances, however, is limited by the pin 107 and the aperture 108 in the second register wheel 102. Consequently, while the second register wheel 102 is limited upon depression of the left end of the control lever 82 to a single unit of actuation, prior to return of the control lever 82 to normal position by its spring 141 with the resulting reengagement of the latch pawl lever 114 with the units register wheel 101, the actuating spring 106 will continue to rotate the units register wheel 101 until stopped by the pin 107 engaging the lower end of the aperture 108. The aperture 108 is made of just sufficient length relative to the diameter of the pin 107 to permit the units register wheel 101 to be rotated an additional amount equal to a second unit of value. After reengagement of the latch pawl 114 with the units register wheel 101 upon return of the control lever 82 to normal position, the stop pawl lever 131 associated with the second register wheel 102 is disengaged therefrom against the action of its spring 134. During such relative movement by the units register wheel 101 and the second register wheel 102 in excess of the single increment of movement of unit value imparted to the wheel 102, the spring 112 associated with the latter will be extended by the pin 107. Consequently, upon release of the wheel 102 by its stop pawl lever 131 when the control lever 82 is returned to normal position, this spring 112 will function to further positively rotate the second register wheel 102 to reengage the upper end of the aperture 108 with the pin 107. During such actuation of the register wheels 101 and 102, no restraint has been placed upon movement of the third register wheel 103. As a result, this wheel 103 has also been moved through a double increment of rotation by virtue of its spring 112 maintaining the upper end of the aperture 109 in contact with the rod 107.

In like manner, oscillation of the control lever 79, which is effected by a quarter passing downwardly through the coin slot 73 and return action of the associated spring 141, results in positive accumulative action of the register comprising the wheels 101, 102 and 103 by the spring 106 to a degree equal to five times that resulting from operation of the control lever 84. Such actuation of the accumulator unit under the con-

trol of the lever 79 is illustrated in its entirety by Figs. 1, 6 and 7. In Fig. 1, the several operative parts are shown in their normal position, with the three register wheels 101, 102 and 103 in their initial or zero position. Depression of the control lever 79 by a genuine quarter delivered to the coin slot 73 in the manner previously described will result in counter-clockwise movement thereof to the position illustrated in Fig. 6. During this operation of the control lever 79, the stop pawl lever 131 associated therewith is first released by the shelf portion 139 to permit engagement of its shoulder 133 with the sloping surface of a tooth 113 of the third register wheel 103 by the associated spring 134. Immediately thereafter, the shelf portion 139 of the control lever 79 swings the latch releasing lever 119 a sufficient distance in a clockwise direction about the shaft 116 against the action of the spring 128 to move the shoulder 118 of the latch pawl lever 114 against the action of the spring 124 to release the same from engagement with the units register wheel 101. As a result, the third register wheel 103 is permitted to be rotated a very short distance which is somewhat less than an increment of rotation of unit value, and is then stopped in the position illustrated in Fig. 6 by engagement of the radial portion of the next tooth 113 on the periphery of the wheel with the shoulder 133. Since the stop pawl levers 131 associated with the register wheels 101 and 102 remain in normally disengaged position and the latch pawl lever 114 is moved to release position, the spring 106 is thus enabled to impart a rotative movement to the units register wheel 101 which is limited only by engagement of the rod 107 with the lower end of the aperture 109 in the restrained register wheel 103. As illustrated in Fig. 6, such movement of the units register wheel 101 will be accompanied by similar movement of the second register wheel 102 by virtue of its spring 112 carrying the same along with the rod 107. Also, since the rod 107 has thus been moved from its position of Fig. 1 to its position of Fig. 6 and the third register wheel 103 has been restrained against more than a very small degree of movement, the spring 112 associated therewith has been elongated to the extent illustrated in Fig. 6. Return movement of the control lever 79 to normal position by its spring 141 will then result in the several parts being moved to their positions of Fig. 7. During such operation, the latch releasing lever 119 is first moved by the spring 128 to permit return of the latch pawl 114 by the spring 124 into engagement with the units register wheel 101. After such engagement has been effected, the stop pawl lever 131 associated with the third register wheel 103 is disengaged therefrom against the action of its spring 134. Such disengagement of the third stop pawl lever 131 permits the spring 112 associated with the register wheel 103 to positively rotate the latter until the upper end of the aperture 103 therein engages the rod 107. In this manner, the three register wheels 101, 102 and 103 of the accumulator unit have a multiple positive actuation imparted thereto by the spring 106 which is equal to five times the single unit of movement imparted thereto under the control of the lever 84. The extent of this movement is determined by the length of the aperture 109 in the register wheel 103, so that it will be readily appreciated that the same may be varied to equal any other

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multiple value by making the aperture 109 of different length.

It will thus be seen that the three coin actuated levers 79, 82 and 84, together with the operative parts of the accumulator unit associated therewith, are operable in response to the deposit of coins of different denominations in the slot 41 to control single accumulative actions of different degrees of the accumulator unit by the spring 106 corresponding respectively to the different denominational values of the deposited coins. It will also be understood that repeated operations of the different control levers 79, 82 or 84, or successive operations thereof, will cause successive positive actuations of the accumulator unit by the spring 106 to rotate the register wheels thereof in a counter-clockwise direction for a distance equal to the total denominational values of the coins deposited. In other words, if a nickel is deposited in the slot 41, the accumulator unit will receive only an actuation equal to a single unit of value, while the deposit of either a dime or a quarter in the slot 41 will cause positive actuation of the accumulator through multiple degrees of movement equal, respectively, to either two times or five times that of the unit value resulting from the deposit of a nickel. Likewise, the successive depositing of a nickel, a dime and a quarter will result in the spring 106 rotating the accumulator unit a distance equal to eight units of value, but such accumulative actions will be imparted thereto in only three separate movements each of different extent, rather than eight successive step-by-step movements of equal extent.

In order to avoid fraudulent operation of the above described apparatus, it is essential that the accumulator unit be operable only under the control of the levers 79, 82 and 84. It is also an important feature that these control levers be operable only when the unit 21 as a whole is mounted in correct vertical position. Means are provided for accomplishing these functions, with particular stress being laid upon the feature of preventing actuations of the control levers 79, 82 and 84 by application of a blow or other sharply delivered force to the unit 21 or its supporting structure 22. In the embodiment of the invention illustrated in the drawings, this means comprises a plurality of locking plates 143 (Figs. 1 and 3) freely pivotally mounted adjacent their upper ends in spaced relationship to each other upon a suitable stub shaft 144 carried by the rear frame plate 96. Each of these locking plates 143 is provided with a depending tailpiece 145, the right hand vertical surface of which normally rests against the lower spacer rod 97 due to the center of gravity of the plates 143 being disposed to the right of their pivotal mounting upon the stub shaft 144. Each of the locking plates 143 is also provided with an arm 146 extending to the left thereof and terminating in an upwardly bent portion normally underlying a shoulder 147 formed integrally with and extending rearwardly from the rear leg of the yoke or latch releasing lever 119. With this arrangement, a sharp blow delivered against the right side of the instant unit, for example, which might conceivably result in downward movement of the long left-hand end portions of the levers 79, 82 or 84 will also cause the locking plates 143 to be swung in a clockwise direction about the pivot 144. Such swinging of the locking plates 143 will project their bent arms 146 into the path of movement of the shoulder 147 of the yoke

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lever 119 to prevent swinging of the lower end of the latter to the left, which will prevent downward movement of the left ends of the control levers 79, 82 and 84.

In order to enable the accumulator unit 25 to control the operation of the desired machine or mechanism with which it is to be associated, the following means are incorporated therein. A horizontally disposed and insulated pin 148 (Figs. 1, 2 and 3) is secured to and extends rearwardly from the units register wheel 101. In the normal or zero position of the accumulator unit, as illustrated in Fig. 1, the pin 148 rests against the upper end of a spring contact member 149 which, together with a stationary contact member 151, comprises a switch 152 for controlling the operation of the automatic phonograph or other machine with which the instant unit is intended to be used. As soon as any one of the control levers 79, 82 or 84 is actuated in the manner previously described to permit rotation of the accumulator, the pin 148 will be removed from engagement with the spring contact 149 to permit the latter to engage the contact 151 to close the switch 152. This will result in initiation and operation of the machine controlled by the instant unit in a manner to be later more fully described.

Means are also provided as a part of the accumulator unit 25 for returning the register wheels 101, 102 and 103 to normal or zero position after actuation thereof. This means is electrically operated so as to be controlled by operation of the automatic phonograph or other mechanism with which the instant device is employed, in a manner to be described hereinafter, and comprises a solenoid 153 (Figs. 1 and 3) mounted by means of a bracket 154 upon the rear frame plate 156 above the register wheels. Pivotally mounted adjacent its upper end upon an extension of the bracket 154 is a lever 155 which comprises the armature of the solenoid 153. A coil spring 156 (Fig. 1) is secured at its left end to the upper end of the lever 155 and at its right end to an upward extension 157 of the bracket 154. The spring 156 functions to normally maintain the lever 155 in inactive position against a stop 158 secured to and depending from the bracket 154. Pivotally mounted adjacent the lower end of the lever 155 and extending there-through is a pawl 159 which is normally held against a stop 161 disposed therebelow by a spring 162 interconnected between the left end of the pawl and a finger 163 struck out from the lever 155. Counter-clockwise movement of the lever 155 by the solenoid 153 against the action of the spring 156 will result in engagement of one of the teeth 113 of the units register wheel 101 by the pawl 159 to rotate the wheel 101 in a clockwise direction, viewing Fig. 1. The extent of actuation thus imparted to the units wheel 101 by the pawl 159 is limited by a stationary stop 164 extending forwardly from the rear frame plate 96 to an increment equal to a single unit of value. Successive operations of the lever 155 by the solenoid 153 will thus result in step-by-step negative actuations of the accumulator unit to return the same to initial or zero position. The solenoid 153 and associated mechanism thus constitute means for zeroizing the accumulator unit comprising the register wheels 101, 102 and 103. As seen in Fig. 3, the pawl 159 is disposed in transverse alignment and cooperates only with the units register wheel 101, and the negative actuation of the wheel 101 thereby

is transmitted to the second and third numeral wheels 102 and 103 by the pin 107. Each negative actuation of the wheel 101 by the pawl 159 as limited by the stop 164 is just sufficient to rotate the wheel 101 far enough to bring the next adjacent tooth 113 thereof into active engagement with the latch pawl 114, so that the latter functions to prevent return of the register wheel by the spring 106. Such step-by-step zeroizing of the accumulator unit by the pawl 159 also functions to rewind the positive actuating spring 106. When the accumulator unit has received sufficient negative actuations, each of units value, to return the same to normal or zero position, the pin 148 will be carried back into engagement with the spring contact member 149 to move the latter out of engagement with the contact 151 to open the switch 152.

In view of the arrangement of the pin 148 and the cooperating contact member 149, it is necessary to prevent the accumulator unit from having a complete rotation imparted thereto. This function is accomplished by providing a stationary stop 165 (Figs. 1, 2 and 3) extending forwardly from the rear frame plate 96 against which the pin 148 impinges to limit the positive actuation of the accumulator unit by the spring 106.

As previously noted, the coin control and credit register unit of the instant invention may be employed specifically to determine the operative period or number of operations of any desired machine or mechanism, such as an automatic phonograph. In Figs. 15 and 16, the present unit 21 is diagrammatically illustrated in combination with an automatic phonograph of the type disclosed in U. S. Letters Patent No. 2,159,834, issued May 23, 1939, to P. H. Smyth, Jr. In these figures the same reference letters are employed to designate the several operating parts of the automatic phonograph as are used in the Smyth patent. Briefly, the phonograph mechanism includes a turntable G for rotatably supporting a selected record in playing position relative to a tone arm H which is electrically connected in the usual manner to any desired type of sound reproducing mechanism. A mounting assembly I is provided for supporting a plurality of pivoted, ring-shaped record carriers or trays J which are arranged one above another in stack relationship and are swingable to and from cooperative relationship with the turntable G. The several movable parts of the mechanism are actuated by a main driving cam M which is rotated by an electric motor N, and a second electric motor O is provided for controlling the operation of the automatic phonograph to effect the playing of any one or more of the records carried by the several trays J. Which records are to be played is determined by manually operable selector means V, and automatic control mechanisms indicated by the reference characters Y and Z are included for effecting completion of each cycle of operations of the machine.

As shown in Fig. 15, the switch 152 of the instant accumulator unit 25 is connected by a suitable conductor 166 to one side 167 of the main line or source of electrical energy, and the other side of the switch 152 is connected by a conductor 168 to one side of the control device Z. The control device Z comprises a switch which is normally maintained in closed position by one of the cam surfaces of the main driving cam M, and the other side of this control device is connected by a conductor 169 to one side of the main

driving motor N. The other side of the motor N is connected to the remaining side 171 of the main line or source of energy. The turntable motor O is separately connected in the circuit by a conductor 172 leading from the conductor 168 and a conductor 173 connected to the main line 171. The control device Y comprises a normally open switch, one side of which is connected by a lead 174 to the conductor 168, while the other side is connected by a lead 175 to the conductor 169. Another normally open switch 176 is provided which is connected at one side by a lead 177 to the conductor 176 and at the other side by a lead 178 to one side of the solenoid 153 incorporated in the accumulator unit 25. The other side of the solenoid 153 is connected by a lead 179 to the conductor 166. The switch 176 is normally held in open position by a notched disc 181 which permits the same to be temporarily closed and then reopened just prior to the completion of each cycle of operations of the phonograph mechanism, the disc 181 forming a part of the main driving cam M.

The operation of the automatic phonograph mechanism under the control of the accumulator unit 25 is as follows. As previously described, deposit of a nickel, dime or quarter in the slot 41 of the unit 21 results in a positive actuation of corresponding degree being imparted to the accumulator wheel 101 to initially close the switch 152. This results in energization of the main motor N and the turntable motor O through the circuits represented in Fig. 15 by the conductors 166, 168 and 169, and the conductors 172 and 173, respectively. Delivery of the first record selected by the manually operative means V is accomplished by the main driving cam M operated by the motor N, in the manner described in Patent No. 2,159,834, during the first half revolution of the cam. At such time, the control device or switch Z is opened to deenergize the main motor N, and the latter remains in such condition during the playing of the selected record. During the playing of the record, the tone arm H is swung in a counterclockwise direction by virtue of the needle carried thereby following the sound track in the record, and as the playing of the record is completed, the control device comprising the switch Y is closed by the tone arm. This reenergizes the main driving motor N by completing a circuit therethrough comprising the conductors 174, 168 and 166 and 175 and 169. This causes the main cam M to be rotated for the second half of its cycle, which initially closes the switch Z, causes the return of the tone arm H to reopen the control device Y and returns the selected record to its associated tray J and moves the latter back into stack relationship. Just prior to the completion of the cycle of operations, the notched disc 181 permits the temporary closing of switch 176 which, through a circuit comprising the conductors 177, and the conductors 178, 179 and 166, temporarily energizes the solenoid 153. As previously described, energization of the solenoid 153 swings the lever 155 against the action of the spring 156 to cause the pawl 159 to impart a single negative actuation of units value to the accumulator wheel 101. If only a nickel has been deposited in the slot 41, such negative actuation of the accumulator unit by the pawl 159 will result in return of the wheel 101 to normal position to cause the pin 148 to reopen the switch 152 to deenergize both the main motor N and the turntable motor O. If more than a single unit of positive actuation has been im-

parted to the accumulator by virtue of the deposit of other coins in the slot 41, the above described cycle of operations of the phonograph will be automatically repeated until such time as the accumulator unit is completely returned to normal position by successive negative step-by-step movements resulting from energization of the solenoid 153 at the end of each cycle of operations.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a machine of the class described, coin deposit means having a plurality of discharge openings and including means for selectively directing coins of different sizes deposited in said deposit means to respectively different discharge openings, a units ratchet rotatable through any of successive equal steps each corresponding to the coin size of unit value receivable in said coin deposit means, actuating means for imparting variable degrees of movement to said units ratchet, means for normally restraining said units ratchet against operation by said actuating means, control means associated with the discharge opening through which coins of unit value size are directed, and actuated by said coins for operating said restraining means to enable said actuating means to impart a single unit of movement to said units ratchet, a plurality of other ratchets mounted for movement relative to said units ratchet, means interconnecting said unit and other ratchets for permitting relative movement between said units ratchet and each successive one of the other said ratchets in degrees corresponding respectively to particular multiples of the movement imparted to said units ratchet as determined by said control means, and other control means individually associated with the other of said discharge openings and said other ratchets and actuated by deposited coins of different sizes and higher denomination for releasing said restraining means and for preventing movement of their associated ratchets to enable said actuating means to impart single movements to said units ratchet in degrees corresponding to the sizes of the deposited coins as determined by said interconnecting means.

2. In a machine of the class described, coin deposit means including means for guiding coins of different sizes therethrough, a member movable by coins of the size having minimum value receivable by said coin deposit means through a number of units of movement corresponding to the number of coins of such size for accumulating the number of units of movement corresponding to the total number of coins of the size having minimum value deposited in said coin deposit means, actuating means for imparting variable degrees of movement to said member, means for normally restraining said member against movement by said actuating means, control means associated with the one of said guiding means through which operative coins of the size having minimum value are directed for actuation thereby for operating said restraining

means to enable said actuating means to impart a single unit of movement to said member, a movably mounted second member, means interconnecting the first said member and the said second member for adapting the latter for movement with the first said member, and other control means associated with another of said guiding means and the second said member and actuated by deposited coins of different size and higher denomination for releasing said restraining means and controlling the movement of the second said member to enable said actuating means to impart single movements to the first said member in degrees corresponding to the sizes of the deposited coins.

3. In a device of the class described, an accumulator comprising a ratchet wheel constituting a register element, means for actuating said ratchet wheel, means for controlling the operation of said actuating means, means for mounting said accumulator in a predetermined position, and means automatically operable to restrain operation of the control means for preventing operation of said actuating means whenever said accumulator is in any but said predetermined position, comprising freely pivoted means swingable between an inactive position and a restraining position relative to said control means and having a member restrainingly engageable with said control means when said freely pivoted means is in its restraining position.

4. In a device of the class described, an accumulator comprising a ratchet wheel constituting a register element, means for actuating said ratchet wheel, means for controlling the operation of said actuating means, means for mounting said accumulator in a predetermined position, and means automatically operable to restrain operation of the control means for preventing operation of said actuating means whenever said accumulator is in any but said predetermined position, comprising pivoted means swingable between an inactive position and a restraining position, and held by gravity in its inactive position when said accumulator is in said predetermined position and restrainingly engageable with said control means when said pivoted means is in its restraining position.

5. In a device of the class described having coin deposit means including separate coin discharge openings and means for guiding coins of different sizes therethrough, rotatable means movable through a number of units of movement respectively corresponding to the different sizes of coins received in said coin deposit means for accumulating the number of units of movement corresponding to the total number of coins deposited in said coin deposit means, separate means individually associated with each of said discharge openings and respectively engageable and operable by deposited coins of different sizes passing through the associated discharge openings to cause the operation of said rotatable means for accumulating the number of units of movement corresponding to the total number of deposited coins, and automatically operable means for preventing the operation of said separate means by an extraneously applied force, comprising freely pivoted means swingable from a normal inactive position to a restraining position relative to said separate means by the force of a blow or the like applied to the exterior of the device and having a member restrainingly

engageable with said separate means when said
freely pivoted means is in its restraining position.

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