

July 7, 1942.

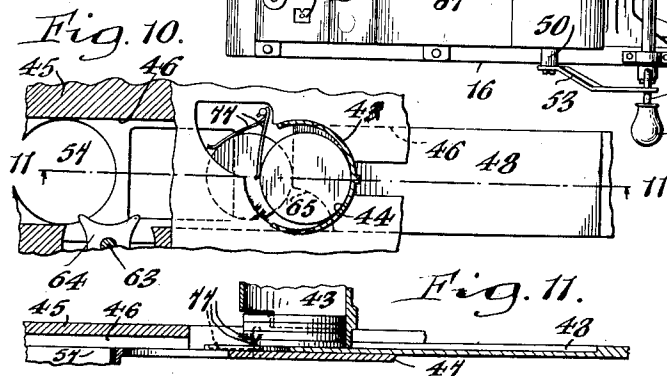
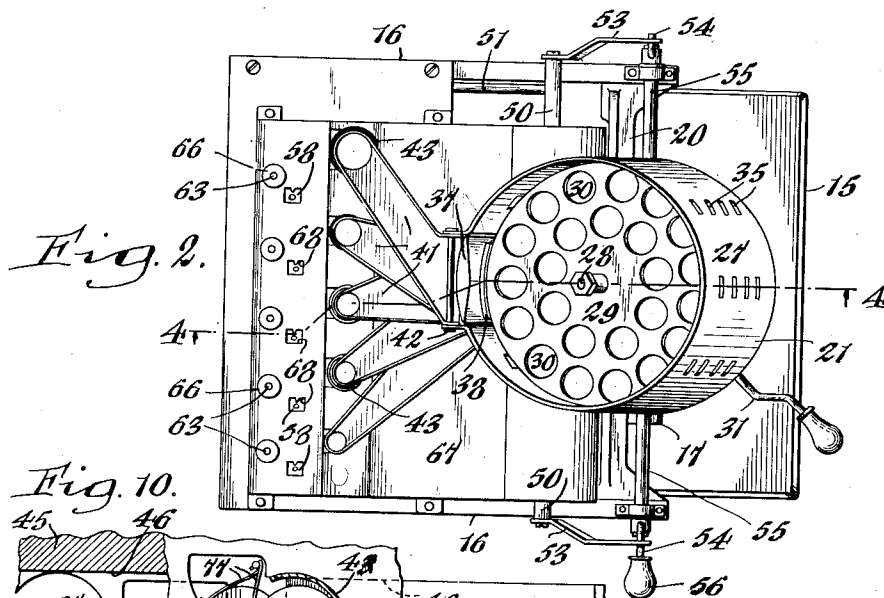
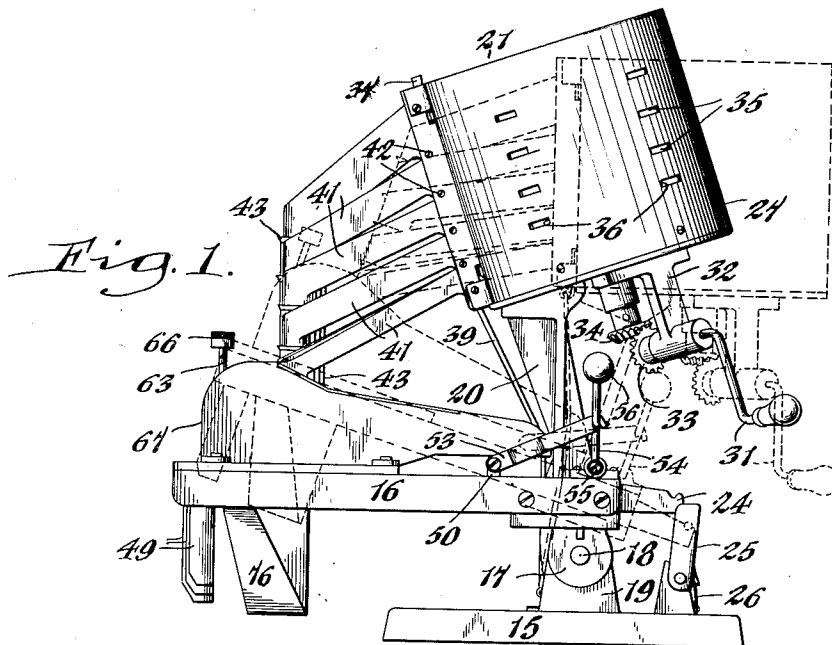
R. B. FLEMING ET AL

2,289,002

MACHINE FOR SORTING AND COUNTING COINS

Filed June 2, 1939

4 Sheets-Sheet 1



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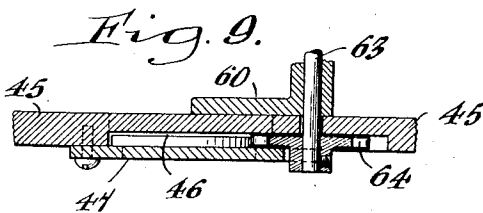
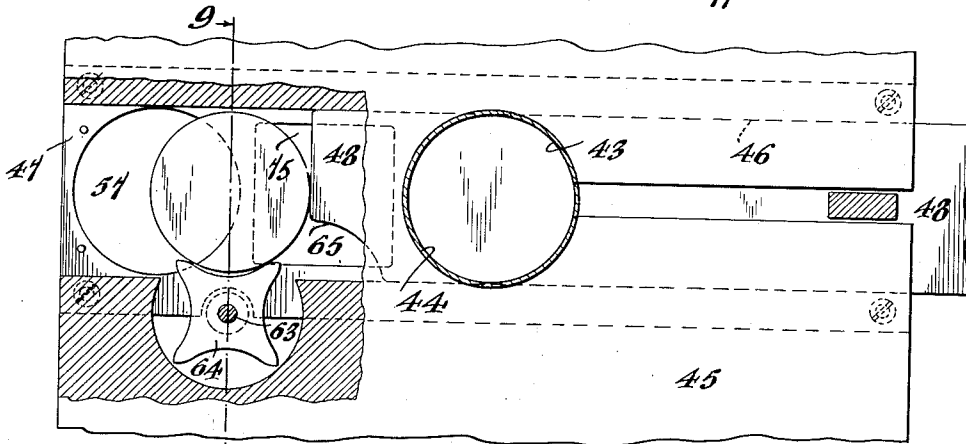
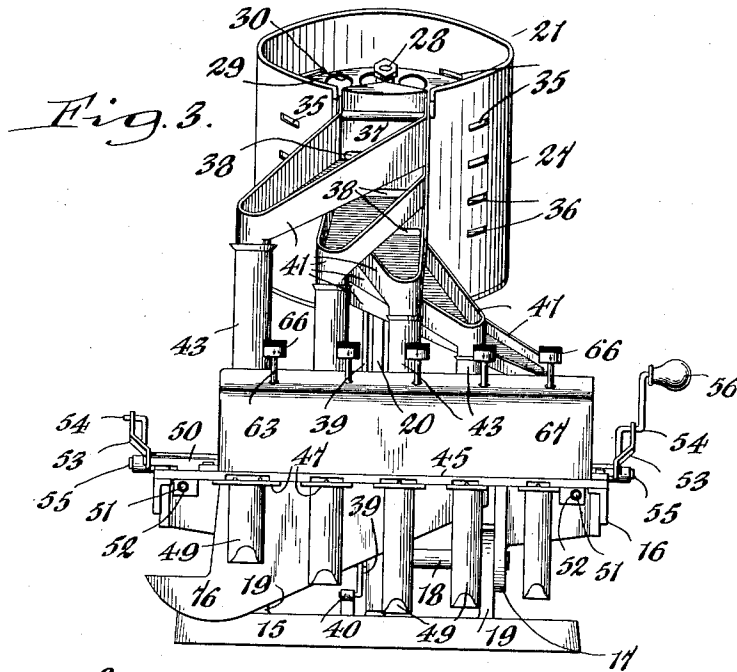
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MACHINE FOR SORTING AND COUNTING COINS

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4 Sheets-Sheet 2



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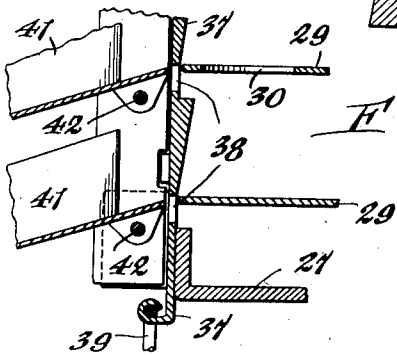
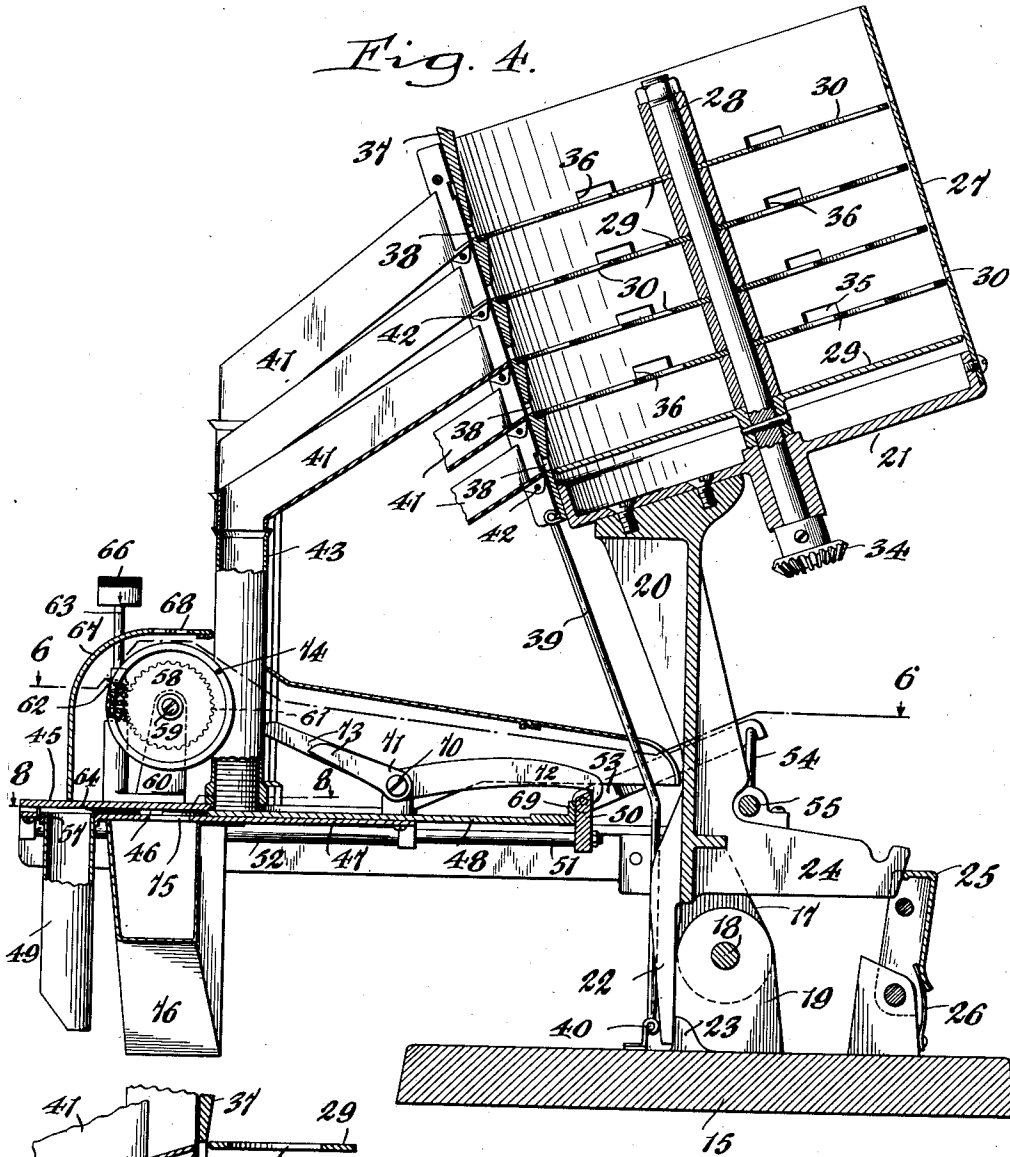
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MACHINE FOR SORTING AND COUNTING COINS

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4 Sheets-Sheet 3



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MACHINE FOR SORTING AND COUNTING COINS

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Fig. 6.

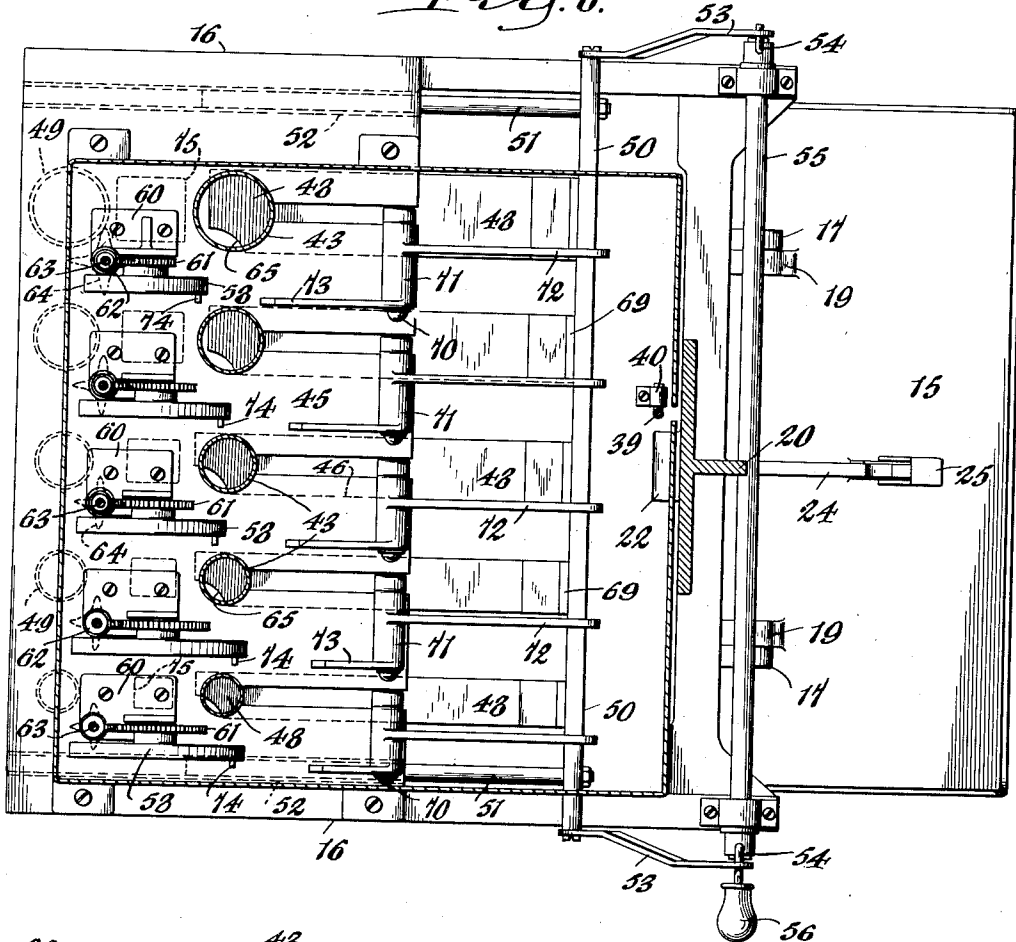
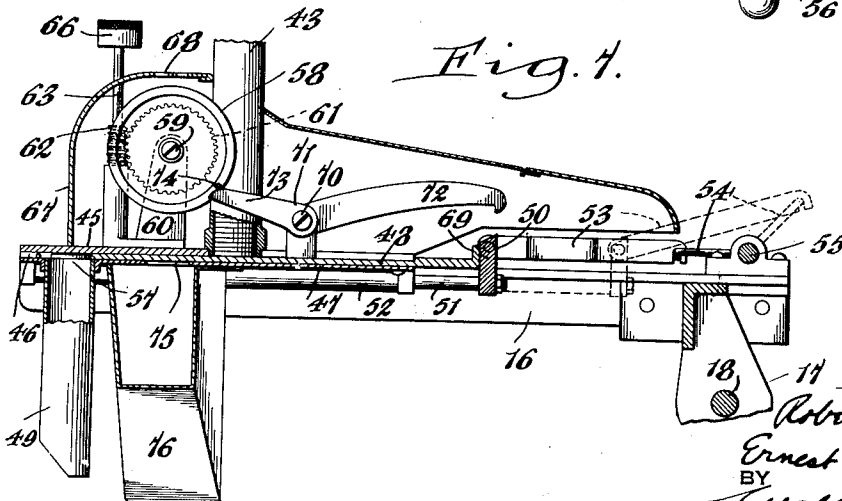


Fig. 7.



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MACHINE FOR SORTING AND COUNTING COINS

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4 Claims. (Cl. 133—8)

This invention relates generally to certain new and useful improvements in coin handling machines, but more particularly to machines for sorting and counting coins.

It has for one of its objects to provide a manually-operated machine of this character which is simple, compact and inexpensive in construction, and which is so designed as to efficiently and accurately sort and count the coins ready for packaging in a suitable receptacle.

Another object of the invention is to provide a portable coin-sorting and counting machine having novel means for effectually and quickly assorting the various denominations of coins and for selectively delivering the sorted coins to the coin-counting mechanism, and means for automatically controlling the release of the respective denomination coin-delivering means when a predetermined number of coins have been counted by the counting device.

Another object of the invention is to provide effective means for ejecting from the respective denominational coin-delivery mechanisms coins of smaller size than those intended, and thereby eliminate any danger of delivering such smaller size coins to the counting mechanism.

Other features of the invention reside in the construction and arrangement of parts hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a side elevation of the coin-sorting and counting machine embodying my invention. Figure 2 is a top plan view thereof. Figure 3 is a front elevation of the same. Figure 4 is an enlarged vertical section taken substantially in the plane of line 4—4, Figure 2, the coin-sorting drum being in its operative tilting position for discharging the coins therefrom. Figure 5 is an enlarged fragmentary vertical section, showing the coin-sorting drum in its upright position. Figure 6 is an enlarged horizontal section taken substantially in the plane of line 6—6, Figure 4. Figure 7 is a fragmentary, vertical section, similar to Figure 4, showing one of the coin delivery and counting units in its released position after discharging a predetermined number of counted coins into the companion receiving tube. Figure 8 is an enlarged horizontal section taken substantially in the plane of line 8—8, Figure 4, and showing the position of the coin and associated parts in counting position and just prior to the discharge of the coin into a companion coin-receiving tube. Figure 9 is a cross section taken on line 9—9, Figure 8. Figure 10 is a fragmentary

horizontal section, similar to Figure 8, showing a modification designed to prevent jamming of the coins in the coin slide. Figure 11 is a vertical section taken substantially on line 11—11, Figure 10.

Similar characters of reference indicate corresponding parts throughout the several views.

Referring now to the drawings, 15 indicates a supporting base or platform on which is pivotally mounted a frame 16 which carries the working parts of the coin-sorter and coin-counting mechanism. This frame is preferably of substantially rectangular shape in plan, being provided at its lower rear side with depending ears 17 which are pivoted to a horizontal pivot shaft 18 supported in bearing lugs 19 rising from the platform 15. Rising from the rear top side of the frame 16 is a bracket 20 on which the coin-sorting unit, indicated generally at 21, is mounted. The frame 16 is normally supported or retained by gravity in the horizontal position and the coin sorter in the forwardly-inclined position shown by full lines in Figures 1 and 4 by means of a depending stop arm 22 abutting against a stop lug 23 rising from the platform, while during the coin-sorting operation these parts are adapted to be shifted to and assume the positions shown by dotted lines in Figure 1 and are held by means of an arm 24 extending rearwardly from the lower end of the frame-bracket 20 for engagement with a pivoted latch bar 25 having a spring 26 bearing thereon for constantly urging such latch to a latching position. In this position of the parts, the coin-sorting unit assumes a substantially upright position, and the coins are dropped into it in promiscuous fashion to be properly sorted according to their denominations.

The coin sorting unit is preferably constructed as follows:

Attached to the bracket 20 is a cylindrical drum 27 which is closed at its bottom and open at its upper end and journaled axially of this drum and extending through it is a shaft 28 on which are mounted for rotation therewith a plurality of axially-disposed coin-sorting disks 29 having coin perforations 30 therein. The perforations in these disks are successively smaller from the uppermost to the lowermost disk so that the largest sized coins remain above the uppermost disk, the next largest coins remain on the next lower disk and so on. These disks are adapted to be rotated in unison by a hand crank 31 journaled in a bearing bracket 32 depending from the drum 27 and having a bevel gear 33 thereon meshing with a similar gear 34 secured to the

lower end of the disk-shaft 28. Formed in the side wall of the drum 27 and in planes immediately above the respective sorting disks 29, are annular rows of slots 35 which form end shoulders 36 and against which the coins are directed by centrifugal force during the rotation of the disks to thereby intercept and deflect any smaller-sized coins, which may be temporarily lodged upon other coins, from such coins so as to be discharged through the disk-perforations to the next sorting compartment. These slots are somewhat shorter than the diameter of a dime or of the smallest denomination of coin used. During the coin-sorting operation, the frame 16 is in the position shown by dotted lines in Figure 1 and by full lines in Figure 5, so that the disks revolve in a horizontal plane and the coins are evenly distributed thereon for assorting them effectually. In the upright position of the sorting drum the coins are prevented from being discharged by means of a vertically-adjustable gate 37 which is suitably guided at the front side of the drum and which has discharge slots 38 therein disposed in cooperative relation with the respective disks 29 so that in the tilted position of the drum these slots are disposed above the plane of the respective disks to permit the coins to be emptied therefrom. In the upright position of the drum the discharge slots 38 are disposed below the plane of the disks in the manner shown in Figure 5, so that the coins are retained therein. The movements of this coin-releasing gate are automatically controlled by the swinging movements of the frame to and from its tilted position, and to this end the lower end of the gate is pivotally connected to the upper end of a vertically-swinging link 39 which is similarly connected at 40 to the base plate 15 as shown in Figure 4. By this construction, when the frame 16 is swung from its full line position shown in Figure 4 to the dotted line position shown in Figure 1 or the full line position shown in Figure 5, the gate 37 is automatically lowered relatively to the sorting disks 29 to bring its discharge openings 38 to a point below registration with the disks, so that the coins are retained in the sorting drum during the sorting operation. When the frame 16 is again lowered to the full line position shown in Figures 1 and 4, the gate 37 is automatically elevated to bring its discharge openings 38 above the plane of the respective sorting disks 29, so that the coins will flow by gravity through those respective discharge ports into companion inclined chutes 41 radiating from the front side of the drum, the largest size coins passing through the uppermost chute, the next largest coins passing through the chute immediately below the last-named one and so on. As shown in Figures 1 and 4, these chutes are preferably pivoted at their inner ends at 42 to permit a slight vertical movement, and their outer or discharge ends are telescopically joined to the upper ends of companion, upright coin-receiving tubes 43 disposed in a row transversely of and rising from the frame 16 and detachably fitted in circular openings 44 formed in a horizontal frame-plate 45. These tubes are of different diameters to accommodate the different-sized coins and from these tubes the coins are successively delivered to the counting mechanism which is preferably constructed as follows:

Slidably mounted in trackways 46 formed between the frame-plate 45 and sub-plates 47, are horizontally-movable coin-engaging slides 48 disposed side by side in cooperative or aligned rela-

tion beneath the discharge ends of the respective coin-receiving tubes 43 and adapted to be reciprocated fore and aft of the machine to transfer the coins successively and intermittently from the bottom of the columns of coins to coin-discharge tubes 49 depending from the front end of the machine and from which tubes the counted coins are adapted to be discharged into suitable coin packages or wrappers. These slides are adapted to be reciprocated in unison or independently of one another, and for this purpose they are individually detachably connected at their rear ends to a common cross bar 50 having guide rods 51 adjacent its opposite ends supported in bearing sleeves 52 applied to the underside of the frame 16 and connected by arms 53 to cranks 54 secured to a horizontal actuating shaft 55 journaled in the frame and adapted to be actuated manually by a handle 56 applied to one of the cranks. The lowermost coin in any coin-receiving tube 43 is adapted to rest upon the companion sub-plate 47 in the retracted position of its cooperating coin slide 48, so that upon the forward stroke of the latter, it abuts the edge of the coin and propels it forwardly to a point in registration with a companion discharge opening 57 formed in the front end of the corresponding sub-plate and axially disposed over the upper end of the companion discharge tube 49. When the coin reaches this position in registration with the opening 57 it drops by gravity into its discharge tube.

During the transfer or travel of coins from the receiving tubes 43 to the companion discharge tubes 49, the coins are adapted to actuate a mechanism for counting the coins as they are successively transferred, and for this purpose intermittently rotatable counting wheels 58 are provided, one associated with each denomination coin slide. Each counting wheel is individually mounted on a stub-shaft 59 applied to a bracket 60 mounted on the frame-plate 45 between the companion coin-openings 44 and 57. These counting wheels may vary in diameter in accordance with the denomination of coins to be counted, so that for each revolution of a given wheel it will count off a predetermined number of coins, say ten fifty-cent pieces, twenty twenty-five cent pieces, fifty ten-cent pieces, and twenty five-cent pieces. Associated with each counting wheel is a worm gear 61 which meshes with a worm 62 mounted on an upright shaft 63 journaled in the companion bracket 60 and provided at its lower end with a four-pointed coin-actuating wheel 64 which is disposed in the plane of and in the path of one side of the marginal edge of a coin as it is transferred by the coin slide 48, so that during the travel of the coin past this wheel, the coin will cause the wheel to be rotated a quarter of a revolution and in turn impart a fractional turning of the companion counting wheel 58. In order that the coin slide, during its forward stroke, will not interfere with the movement of the wheel 64, it is provided at its front edge with a cut-out portion or recess 65, as shown in Figure 8. At its upper end, each worm-shaft 63 may be provided with a knob 66, whereby the corresponding counting wheel may be manually turned for initially setting it when desired. In this connection, the periphery of each counting wheel may be provided with an indicator mark such as "0," and a guard or cover plate 67 preferably extends over these wheels and is provided in the plane of such wheels with window-openings 68 through which the user may observe the

indications and thereby determine the initial setting of the wheels. As shown in Figure 7, the shafts 63 extend through this cover plate with the operating knobs 66 above it.

After a predetermined number of coins of a given denomination have been counted and delivered to a companion discharge tube 43, that coin slide 43 associated therewith is adapted to be automatically released from the reciprocating cross bar 50 so that no further coins are transferred to such tube, such coin slide remaining idle during the subsequent reciprocating movements of the cross bar for actuating the other coin slides. To this end each coin slide is provided at its rear end with an abutment lug 69 adapted to normally bear against the front face of the cross bar 50, and pivoted at 70 to the top side of the slide forwardly of such lug is a vertically-swinging lever 71 having a rearwardly-extending latching arm 72 which is adapted to overhang the cross bar in the manner shown in Figure 4, in which position the coin slide is normally coupled to the cross bar to reciprocate therewith with the lug 69 abutting the front face of such bar. Forwardly of the pivot 70, the lever 71 has a tappet arm 73 which is adapted to engage a trip pin 74 projecting from the companion counting wheel 58, so that when a predetermined number of coins have been counted, and this pin is positioned in the path of forward travel of the tappet arm it causes the lever 73 to be rocked in a direction to release the latching arm 72 from the cross bar, thereby disconnecting the coin slide from it and preventing the passage of any more coins governed by that particular coin slide. As shown in Figure 7, the latching lever is held in its released position by the wheel-pin 74 resting on the tappet arm 73 and remains in that position until the operator turns the counting wheel through the medium of the actuating knob 66 to its initial or starting position, at which time the pin is removed from the tappet arm and the lever swings downwardly by gravity into coupling engagement with the cross bar 50 when it reaches its next forward position. The tappet arms of the different levers may vary in length, as shown in Figure 6, so that they are actuated at the proper time by the companion counting wheel pins 74.

Should a smaller sized coin find its way into any one of the given denomination coin-receiving chutes 43, it will, when it has reached a position in the path of the companion coin slide, be projected by that coin slide into register with a discharge or reject opening 75 which is arranged in the companion sub-plate 47 in advance of the proper coin-discharge opening 57. Such opening is of smaller size than the proper coin opening 57 and of a size to permit the escapement of the smaller-sized coin through such opening, thereby preventing such small-sized coins being propelled and discharged into the associated discharge chute 49. Beneath each of these auxiliary discharge openings 75 is a trough 76 into which the smaller-sized coins drop and from which they can be removed from time to time and again dropped into the sorting drum 27 for re-sorting.

Should thin coins of a smaller size than proper denominational coins find their way to any one of the receiving tubes 43 and tend to jam or interfere with the movements of the coin slides 43, we provide a means for guarding against such a condition by holding the coin immediately above the lowest or thin coin against movement by the coin slide while the thin coin is propelled by the slide to the reject discharge opening 75. The

means for thus holding such coin is shown in Figures 10 and 11 and preferably consists of a laminated spring 77 projecting laterally into one side of the slide-way 45 and above the top surface of a thin coin positioned for propulsion by the slide, but in the plane of the coin immediately resting upon the thin coin. On the forward stroke of the coin slide, the thin coin will be shifted with it and the coin next about it will be held against movement by the spring 77, thereby preventing jamming.

We claim as our invention:

1. In a coin handling machine, a frame having a row of openings therein for receiving coins of different denominations to be counted and companion openings spaced forwardly therefrom for the discharge of the counted coins, coin slides guided for reciprocatory movement on said frame for propelling the coins successively from the receiving openings to the companion discharge openings, a coin-counting wheel associated with each coin slide including a driven coin-actuated member operatively connected therewith and disposed in the path of the slide-propelled coin for advancing such wheel a fraction of a revolution for each coin advanced by the slide, a reciprocating drive member common to the respective slides, means for releasably coupling each of said slides to said drive member, and means governed by the respective counting wheels for releasing the companion slides from the reciprocating drive member when such wheels are advanced a predetermined distance.

2. In a coin handling machine, a frame having a row of openings therein for receiving coins of different denominations to be counted and companion openings spaced forwardly therefrom for the discharge of the counted coins, coin slides guided for reciprocatory movement on said frame for propelling the coins successively from the receiving openings to the companion discharge openings, a coin-counting wheel associated with each coin slide including a driven coin-actuated member operatively connected therewith and disposed in the path of a slide-propelled coin for advancing such wheel a fraction of a revolution for each coin advanced by the slide, a reciprocating drive member common to the respective slides, independent coupling levers applied to said slides, respectively, for releasable engagement with said drive member, and trip means on said counting wheels operatively engageable with the companion levers after a predetermined number of such movements for automatically actuating them to released position.

3. In a coin handling machine, a frame having a row of openings therein for receiving coins of different denominations to be counted and companion openings spaced forwardly therefrom for the discharge of the counted coins, coin slides guided for reciprocatory movement on said frame for propelling the coins successively from the receiving openings to the companion discharge openings, a coin-counting wheel associated with each coin slide including a driven coin-actuated member operatively connected therewith and disposed in the path of a slide-propelled coin for advancing such wheel a fraction of a revolution for each coin advanced by the slide, a reciprocating drive member common to the respective slides, a lever pivotally mounted on each of said slides having a latching arm at one side of its pivot for releasable coupling engagement with said drive member and a tappet arm at the other side of its pivot, and a trip pin applied to each

of said counting wheels for operative engagement at a predetermined time with the tappet arm of the companion slide-lever to swing it in a direction to release its latching arm from said drive member.

4. In a coin handling machine, a frame having a row of openings therein for receiving coins of different denominations to be counted and companion openings spaced forwardly therefrom for the discharge of the counted coins, coin slides guided for reciprocatory movement on said frame for propelling the coins successively from the receiving openings to the companion discharge openings, a coin-counting wheel associated with

each coin slide including a driven coin-actuated member operatively connected therewith and disposed in the path of a slide-propelled coin for advancing such wheel a fraction of a revolution for each coin advanced by the slide, a reciprocating drive member common to the respective slides, means governed by said counting wheels for releasably coupling the companion coin slides to said drive member, and a hand-actuated element operatively connected to said coin-actuated member for pre-setting the companion counting wheel to its initial position.

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