April 7, 1931. E. P. DONNELLAN 1,799,785

COIN HANDLING MACHINE

Filed July 5, 1928 2 Sheets-Sheet 1

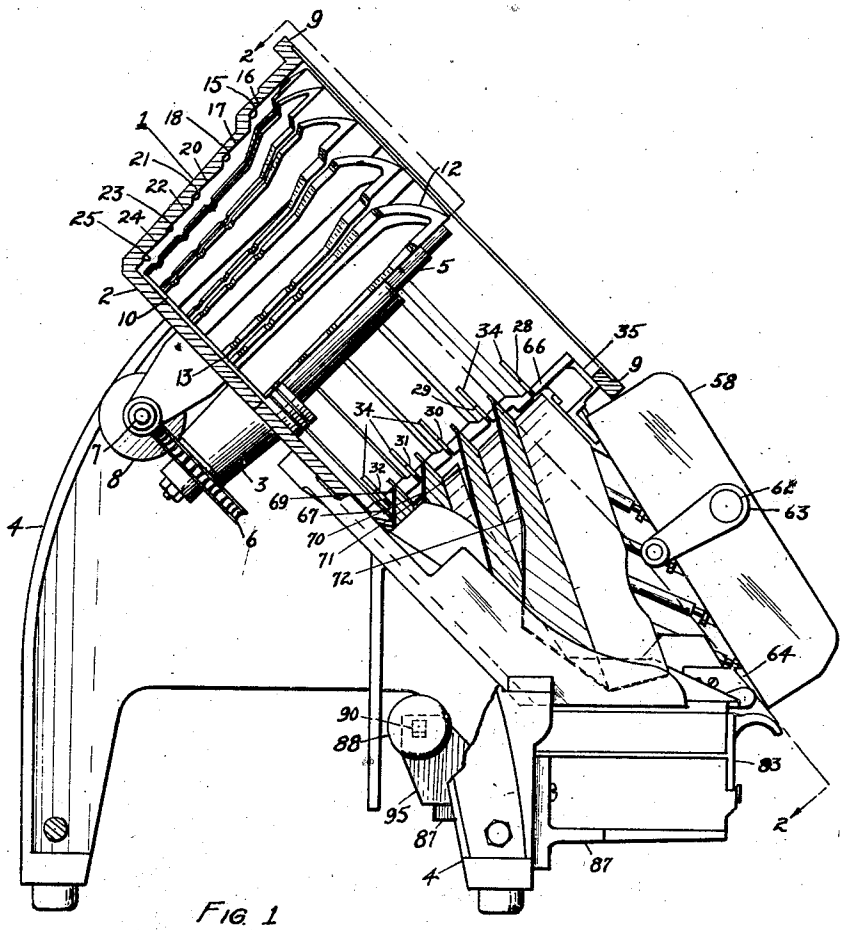


FIG. 1

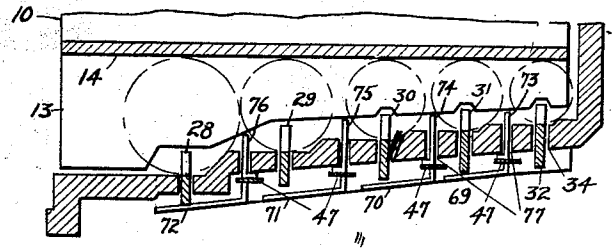


FIG. 4

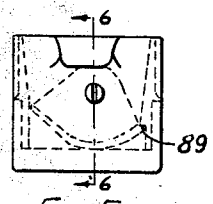


FIG. 5

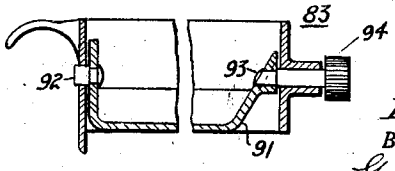


FIG. 6

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COIN HANDLING MACHINE

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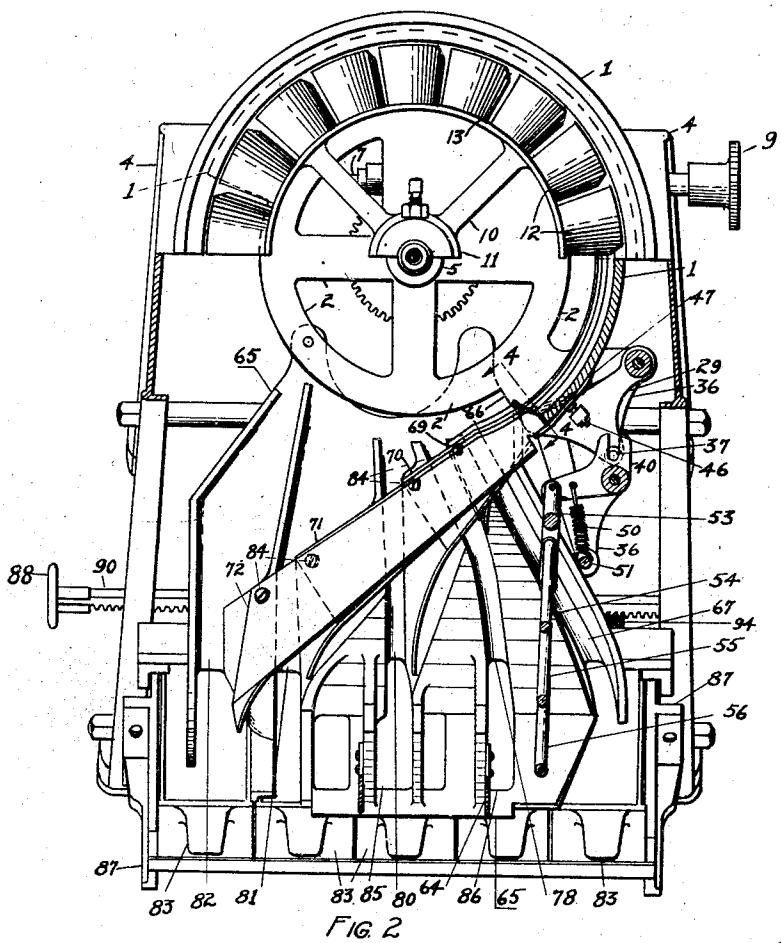


FIG. 2

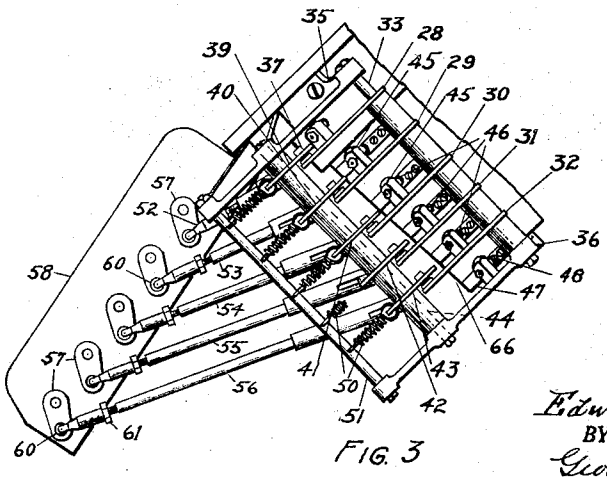


FIG. 3

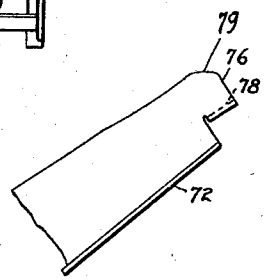


FIG. 7

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UNITED STATES PATENT OFFICE

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COIN-HANDLING MACHINE

Application filed July 5, 1923. Serial No. 290,633.

This invention relates generally to improvements in coin handling machines; and the invention has reference, more particularly to a novel construction of coin assorting and counting machine having novel means for effecting the accurate counting of the assorted coins and the delivery thereof from the machine after counting.

The invention has for its principal object to provide a novel construction of coin assorting and counting machine, which operates not only to accurately count coins without re-registering any of them, but which also is capable of automatically clearing itself of bent or dilapidated coins or other coins for which the machine is not designed.

Another object of the invention lies in the provision of a machine of the above character wherein the delivery of the assorted and counted coins is expedited and then their accessibility after delivery increased.

Other objects of the present invention, not at this time particularly enumerated, will be clearly understood from the following detailed description of the same.

The invention is clearly shown in the accompanying drawings, in which:—

Figure 1 is a left side elevation with parts broken away of the novel coin handling machine made according to and embodying the principles of this invention;

Figure 2 is a sectional view of the coin handling machine, taken along the line 2—2 of Figure 1;

Figure 3 is a right side elevational view of a portion of the coin handling machine;

Figure 4 is a fragmentary section taken along line 4—4 of Figure 2;

Figure 5 is a front elevation of a coin receptacle;

Figure 6 is a sectional view with parts broken away taken substantially along the line 6—6 of Figure 5; and

Figure 7 is an enlarged view of a portion of one of the troughs shown in Figure 2.

Referring to Figures 1 and 2, there is shown one embodiment of the novel coin assorting and counting machine of the type disclosed in the applicant's United States Patent, No. 1,655,412, January 28, 1928. In these figures, the reference character 1 indicates the main body of the machine having a bottom wall 2 and an outwardly extending annular flange 9 at its top. In the bottom wall 2 is formed the centrally located bearing portion 3. Supporting frame members 4 are attached to the sides of the main body 1, in such manner that this main body is supported in an angularly disposed position, so that it slopes, preferably, at an angle of approximately forty-five degrees from the horizontal.

A rotatable spindle 5 is journaled in the bearing portion 3 and is arranged to be driven by the worm and wheel transmission means 6. The worm of the transmission means 6 is secured to a transverse shaft 7 that also carries a pulley 8. Pulley 8 is adapted to be driven from a suitable source of power, such as an electric motor (not shown).

A coin carrier 10 has its hub member 11 fixed on the spindle 5 so as to be rotated within the main body 1 by this spindle. The carrier members 12 of the coin carrier 10 are provided with coin receiving slots 13 extending from the upper to the lower end of the carrier members, each of said slots being closed at its inner side throughout its length by a substantially straight wall 14, but being open at its outer side throughout its length toward the wall of said main body 1. The wall of said main body 1 is formed with a plurality of successive offset annular shoulders 15, 18, 21, 23 and 25 which provide annular coin runways 16, 17, 20, 22 and 24, all as described in the above mentioned patent. A coin of any denomination may be deposited in a coin receiving slot 13, and when so deposited it will gravitate in the latter until stopped in the particular runway corresponding to its size, the smaller coins unobstructedly passing downwardly through the wider runways, while the larger coins are arrested by the offset annular shoulders defining the bottoms of the runways corresponding thereto. In this manner, each coin entered in the coin carrier is at once deposited in an annular path of travel dedicated solely to coins of its particular denomination.

According to the preferred arrangement, the wall of the main body 1 of the machine is provided with slots 34 respectively communicating with the several runways 16, 17, 20, 22 and 24 corresponding to the several denominations of coins which, for example, in United States currency would be the half-dollar, quarter, nickel, penny and dime. A rod 33 extends along side the main body 1 and has its ends mounted in brackets 35 and 36 that are secured to the main body 1. Spaced trip-levers 28 to 32 inclusive are fulcrumed on the rod 33 and have their inner ends extending through the slots 34 so as to respectively enter the runways 16, 17, 20, 22 and 24, to thus lie in the paths of the coins propelled through said runways by the coin-carrier 10. The coins, in passing the trip levers 28 to 32, depress the ends of these levers and thereby cause the operation of a set of registers as will be later described.

Trip levers 28 to 32 have lugs 45 formed on their sides. Adjustable stop pins 46 are threaded through apertures in the lugs 45. The stop pins 46 carried by trip levers 29 to 32 are adapted to abut against leaf springs 47 that are secured as by screws 48 to the main body 1 of the machine. The stop pin 46 carried by trip lever 28 is adapted to abut directly against the main body 1. The trip levers 28 to 32 carry pins 37 that are positioned within slots that are provided in corresponding arms of a plurality of spaced bell crank levers 39 to 43 respectively. Bell crank levers 39 to 43 are fulcrumed on a rod 44 that extends parallel to the rod 33 and has its ends mounted in the brackets 35 and 36. A plurality of tension springs 50 have their corresponding ends secured to the bell crank levers 39 to 43 and to a rod 51, respectively. The tension of the springs 50, acting through the bell crank levers, the pins 37 and the trip levers, tends to cause stop pins 46 to bear against the springs 47 and main body 1. The adjustment of the stop pins 46 within the lugs 45 determines the distances to which the inner ends of the trip levers 28 to 32 project into the runways 16, 17, 20, 22 and 24.

A plurality of links 52 to 56 have corresponding ends pivotally connected to the bell crank levers 39 to 43. The other ends of these links 52 to 56 are universally connected by ball and socket joints 60 to levers 57 of a set of registers contained within a casing 58. The links 52 to 56 are composed of two sections that are threaded together, so that the lengths of these links may be varied somewhat. Lock nuts 61 serve to lock the sections of these links together. The registers within the casing 58 are preferably of the resetting type, and their resetting mechanisms are connected together and to a manually rotatable control shaft 62 that is provided at one end with a suitably connected crank handle 63 for turning the same to re-set the registers at desired times. The casing 58 is secured at its upper end to the bracket 35 and at its lower end by brackets 64 to a chute, designated as a whole by the reference numeral 65.

Adjacent the ends of the trip levers 28 to 32, the side wall and a portion of the bottom 2 of the main body 1, are cut away to provide a coin delivery opening 66 extending for substantially one third of the circumference of the main body 1 (see especially Fig. 2). The sorted coins after passing the trip levers 28 to 32 drop from the runways 16, 17, 20, 22 and 24 through the coin delivery opening 66. From the coin delivery opening 66, the coin of smallest denomination drops directly into a guideway 67 formed in the chute 65, whereas the coins of successively larger denominations drop into angular sheet metal troughs 69 to 72 respectively that extend substantially tangential to that portion of the side wall of the main body 1 that adjoins the coin delivery opening 66. The troughs 69 to 72 are formed with upper extensions 73 to 76 (Figs. 4 and 7), respectively. These extensions 73 to 76 extend through slots 77 provided in the coin runways adjoining the opening 66 so as to respectively enter the runways 24, 22, 20 and 17 and are positioned intermediate or in side by side relation with the inner end portions of the trip levers, as especially shown in Fig. 2. Extensions 73 to 76 cooperate with the annular shoulders of the runways in guiding the coins into the proper trough or into the guideway 67. The portions of the extensions 73 to 76 that enter the coin runways have beveled upper ends 79, so that should advancing coins for any reason strike these extensions, such coins will readily ride over the beveled ends 79, thereby depressing these extensions in a manner to be described without interfering with the operation of the machine. Extensions 73 to 76 have perpendicular flanges 78 that are normally held in abutting relation with the side wall of the main body 1 by the action of the leaf springs 47.

The troughs 69 to 72 slope downwardly and each of these troughs conducts the coins of the particular denomination received by it into an individual guideway provided in the chute 65. Thus the trough 69 conducts coins into a guideway 78, trough 71 into a guideway 81 and trough 72 into a guideway 82. Troughs 69 to 72 are pivotally attached near their lower ends to the chute 65 as by screws 84. When the extension of a trough is depressed by a coin riding over its beveled end 79, the trough is adapted to swing outward slightly about its pivotal screw 84. The guideways 67, 78, 80, 81 and 82 guide the coins of different denominations into individual coin drawers 83 provided under the lower end of the chute 65. Thus, guideway 82 guides the coins of largest denomination, for

example, the half-dollars, into the drawer 83 on the extreme left of Fig. 2. Guideway 81 guides the quarter-dollars into the second drawer 83 counting from the left toward the right of Fig. 2. Guideway 80 guides the nickles through an aperture 85 in the bottom of the chute 65 into the third or middle drawer 83. Guideway 78 guides the pennies through an aperture 86 in the bottom of the chute 65 into the fourth drawer 83. Guideway 67 guides the dimes into the fifth and last drawer 83.

The drawers 83 are carried by a tray member 87 that is suitably secured at its ends to the frame members 4. Drawers 83 have dumping bottoms 91 (see also Figs. 5 and 6) that are arranged to be manually operated, from a knob 88 secured to a toothed rack 90, to cause the coins within the drawers to be discharged into suitable receptacles (not shown) placed below the machine. Each of the dumping bottoms 91 have pins 92 and 93 at their ends. The pins 92 and 93 are pivotally mounted in bearings in the end walls of the drawers 83. Each dumping bottom 91 is so designed that the greater portion of its weight is at one side of the pins 92 and 93, thereby causing one of its upper side edges to bear against a longitudinal shoulder 89 provided in the drawer 83. Thus in Fig. 5, the portion of the dumping bottom 91 that is to the left of pins 92 and 93 outweights that portion to the right of these pins, causing the right side upper edge of this dumping bottom to bear against shoulder 89. Pins 93 have pinions 94 secured to their outer ends which pinions are adapted to mesh with the toothed rack 90 when the drawers are assembled in the tray member 87. Pinions 94 are angularly positioned on pins 93 so that with the upper side edges of the dumping bottoms in engagement with shoulders 89, should the drawers 83 be inserted into the tray member 87, the teeth of pinions 94 mesh with the teeth upon the rack 90 without necessitating angular movement of pinions 94. The toothed rack 90 is supported near its ends in brackets 95 that are secured to the tray member 87. With the drawers 83 assembled in the tray member 87, should the knob 88 be moved in the direction of the length of the rack 90, the pinions 94 will be driven to effect the dumping of the contents of the drawers 83.

In operation, the mixed coins are fed into the receiving slots 13 of the revolving coin carrier 10 at a point near the top of the machine in the manner described in the above mentioned patent. Since this manner of feeding the coins into the slots 13 forms no part of the present invention, it is neither illustrated nor described. Assuming that a half-dollar is fed into one of the receiving slots 13, this coin will gravitate until stopped by the shoulder 15 of the main body, and will be caused to move around the half-dollar runway 16, in a clockwise direction as viewed in Fig. 2 while being held in cross-wise relation thereto by the carrier member 10. If the coin is a quarter, it will drop through the half-dollar runway but will be stopped by the shoulder 18, and will be caused to move around the quarter dollar runway 17; if the coin is a nickel, it will drop through the larger coin runways for half and quarter dollars but will be stopped by the shoulder 21, and will be caused to move around the nickel runway 20; if the coin is a penny it will be stopped by the shoulder 23 and will be caused to move around the penny runway 22; and if the coin is a dime it will be stopped by the shoulder 25 and will be caused to move around the dime runway 24. Thus, each denomination of coin travels in a separate and distinct plane of movement, thereby separating the coins from each other and enabling each coin to be counted. The counting of the coins is effected by the depressing of the ends of the trip-levers 28 to 32 by the coins in their passage through the machine. The passing engagement of a coin with the trip-lever cooperating with its runway, swings the trip-lever about the rod 33 as a fulcrum, which movement causes the pin 37 carried by the trip lever to actuate that one of the bell crank levers 39 to 43 which is connected with the actuated trip-lever. The bell-crank lever turns about the rod 44 as a fulcrum, which movement is transmitted through one of the links 52 to 56 to the proper register, the latter being thus actuated by the passing of each coin of corresponding denomination, all of which will be clearly apparent from an inspection of the figures of the drawings.

The coins in advancing toward the ends of the trip levers are positioned centrally with respect to these levers by the guiding action of the annular stop shoulders, so that the coins actuate the trip-levers positively and to the desired extent. Should a coin tend to shift cross-wise of the coin runway under the force exerted upon it by a trip lever, the adjacent trough extension will confine the coin to its central position. This action of the adjacent trough extension will be apparent when it is noted that a certain amount of force is necessary to depress the trip-levers and a coin in passing over a trip-lever may tend to shift sidewise off of the trip-lever. Sidewise motion of the coins in one direction is prevented by their respective annular stop shoulders. Sidewise motion of the coins in the other direction, however, is stopped by the action of the trough extensions. For example, if it be assumed that a nickel is passing along the nickel runway 20 and engages the nickel trip lever 30, then the coin, owing to the resistance of this trip-lever, may tend to veer sidewise thereof. As especially shown in Fig. 4, motion

of this nickel to one side of the trip-lever 30 is positively prevented by the action of the annular stop shoulder 21 while any tendency of this nickel to shift toward the other side of this trip-lever 30 is prevented by the nickel contacting with the upper trough extension 75 of trough 71 which trough extension is positioned opposite the inner end portion of the trip lever 30. The coin thusly confined between annular stop shoulder 21 and extension 75 passes over the inner end of the trip-lever 30 depressing this lever and actuating the proper coin register, and then falls into trough 70 whence it is conveyed into guideway 80.

After the coins have passed the register actuating trip-levers 28 to 32, they are immediately discharged through the coin delivery opening 66. The extensions 73 to 76 of the troughs 69 to 72 guide the coins in their passage through the coin delivery opening 66 so that each coin passes only into that trough which is assigned to its particular denomination. The extension 73 also acts to guide the dimes into the guide-way 67 of the chute 65. From the troughs 69 to 72 the coins pass into the guideways 78, 80, 81 and 82 respectively and from these guideways and guidway 67 into the drawers 83.

A bent or dilapidated coin or a coin of a denomination for which the machine is not designed, such as a foreign coin, upon entering the coin carrier 10 may not gravitate to one of the annular shoulders 15, 18, 21, 23 or 25 owing to the dimensions of the coin. Thus a bent or dilapidated coin being misshapened, may bind in its respective coin runway before reaching the annular shoulder of that runway. This will be apparent when it is noted that the space for the coin between the runway and the wall 14 is but slightly greater than the width of a normal coin, and consequently a misshapened coin, which would have a point or points of its circumference bulged outwardly somewhat, may jam in the runway before it reaches or gravitates to the annular stop shoulder of that runway, in which case the coin as it advances along the runway under the motivating action of the coin carrier 10, will not approach directly onto the trip-lever of that runway. In such event this coin may advance so that instead of moving toward the end of one of the trip levers, it moves so as to strike against the beveled end 79 of one of the troughs 69 to 72 as will be apparent from viewing Fig. 4. In this case the coin will ride over the beveled end 79, depressing the trough extension having such beveled end, and causing the trough of which it is a part to turn outwardly of the main body about its pivotal screw 84 while deflecting the spring 47 that normally holds the end 79 so that it projects into the coin runway. In passing the beveled end 79 of the trough the coin will drop through the opening 66 and be conducted to one of the drawers 83. The trough will then be swung inwardly into its normal position by the action of the spring 47 that was deflected by the passing coin. It will thus be seen that the machine is capable of clearing itself and the registering apparatus of all such irregular coins, including coins of denominations for which the machine is not designed.

It will be noted that when the coins pass the ends of the trip levers, they immediately drop through the discharge opening 66 so that there is no possibility of re-registering coins. This is important as it is absolutely essential that the registering apparatus indicate accurately the number of coins passing through the machine. Owing to a coin getting stuck in the feeding mechanism (not shown) it is sometimes necessary to reverse the machine as by means of the hand wheel 9. In this event, were the coin runways continued beyond the ends of the trip levers, coins may be re-registered by again depressing the ends of the trip levers.

From the above description it will be evident that this invention provides a very simple, compact and efficient machine operative to both sort and count mixed coins. Should it be desired to use the machine as a sorter without counting the coins, the counting mechanism may be omitted.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. In a coin handling machine, a main body formed internally to provide a series of spaced annular coin runways corresponding to coins of several denominations, said coin runways terminating in a discharge opening, and coin conducting means having portions adapted to enter said coin runways and serving to guide coins from said discharge opening.

2. In a coin handling machine, a main body formed internally to provide a series of spaced annular coin runways corresponding to coins of several denominations, said coin runways terminating in a discharge opening, coin guiding means having portions adapted to be positioned within said coin runways for guiding coins through said discharge opening, and resilient means cooperating with said coin guiding means and tending to retain said portions in position in said coin runways.

3. In a coin handling machine, a main body formed internally to provide a series of spaced annular coin runways corresponding to coins of several denominations, said coin

runways terminating in a discharge opening, a series of pivoted trip-levers respectively having their inner ends adjoining said discharge opening and projected into the respective coin runways to lie in the normal path of movement of coins propelled therethrough, a series of counting registers corresponding respectively to the several denominations of coins means operatively connecting said trip levers respectively with the respective counting registers, and a series of members having extensions projecting into certain of the coin runways to lie adjacent the normal paths of movement of the coins propelled therethrough, said extensions acting to aid in guiding coins past said trip levers and through said discharge opening.

4. In a coin handling machine, a main body formed internally to provide a series of spaced annular coin runways corresponding to coins of several denominations, said coin runways terminating in a discharge opening, a series of pivoted trip-levers respectively having their inner ends adjoining said discharge opening and projected into the respective coin runways to lie in the normal path of movement of coins propelled throughout, a series of counting registers corresponding respectively to the several denominations of coins, means operatively connecting said trip levers respectively with the respective counting registers, and a series of guide members having extensions adapted to be positioned within certain of said coin runways to lie adjacent the normal paths of movement of the coins propelled therethrough, and resilient means cooperating with said guide means and tending to retain said extensions in position in said coin runways, said extensions being capable of being pushed out of said coin runways against the force of said resilient means by coins striking said extensions.

5. In a coin handling machine, a main body formed internally to provide a series of spaced annular coin runways corresponding to coins of several denominations, said coin runways terminating in a discharge opening, a chute positioned below said discharge opening, and troughs pivoted at their lower ends on said chute and extending substantially tangential to said main body said troughs being arranged to conduct coins from said coin runways through the discharge opening and onto said chute.

6. In a coin handling machine, a main body formed internally to provide a series of spaced annular coin runways corresponding to coins of several denominations, said coin runways terminating in a discharge opening, a chute positioned below said discharge opening, said chute having a plurality of guideways corresponding to coins of several denominations, troughs pivoted at their lower ends upon said chute and adapted to conduct coins from said coin runways to the corresponding guideways in said chute, said troughs having extensions adapted to be positioned within certain of said coin runways and springs cooperating with said extensions and tending to retain said extensions in position in said coin runways, said extensions being adapted to be pushed out of said coin runways, effecting the turning of said troughs about their pivotal connections so as to allow the passage of irregular coins.

In testimony, that I claim the invention set forth above I have hereunto set my hand this 28th day of June, 1928.

EDWARD P. DONNELLAN.