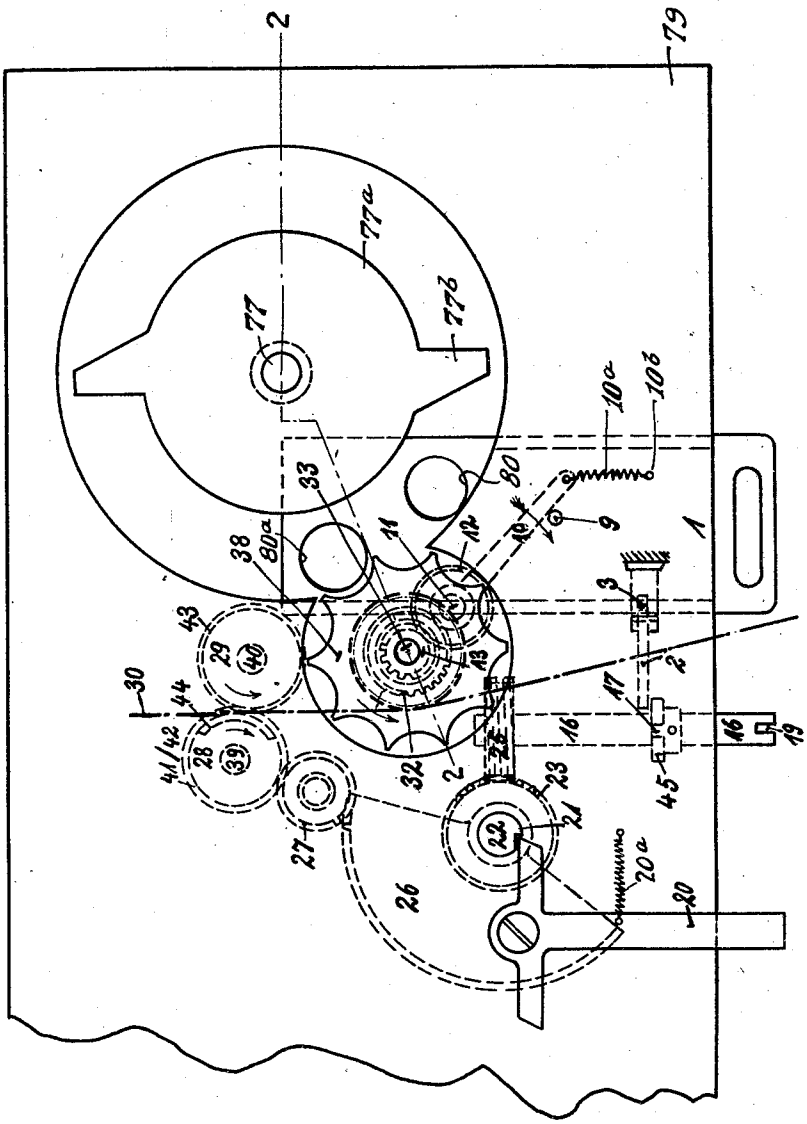
April 5, 1932. S. CHIGER 1,852,106

MACHINE FOR SORTING, COUNTING, AND PACKING COINS

Filed Nov. 16, 1929 3 Sheets-Sheet 1

Fig. 1.



Inventor:
Siegmund Chiger,
By Alfred Hahn
Atty.

April 5, 1932. S. CHIGER 1,852,106

MACHINE FOR SORTING, COUNTING, AND PACKING COINS

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Fig. 2.

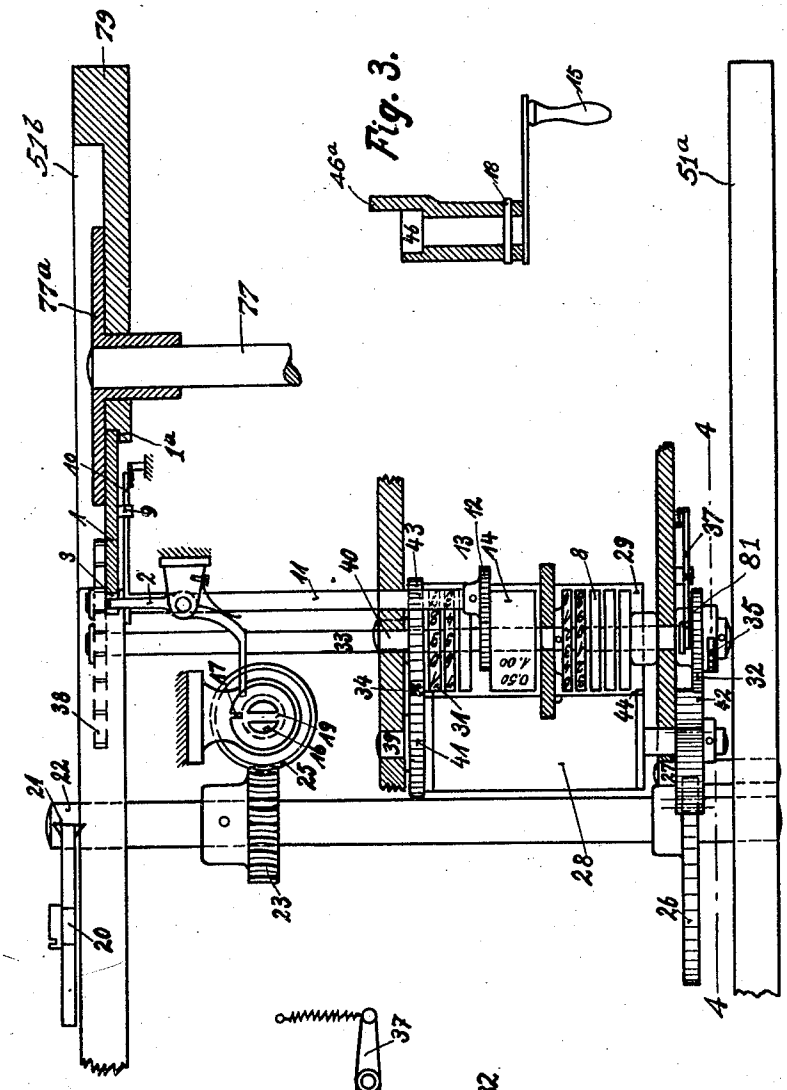
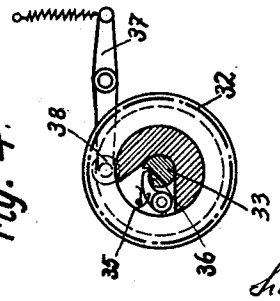


Fig. 3.

Fig. 4.



Inventor:
Sigmund Chiger
By Appleman
Atty.

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MACHINE FOR SORTING, COUNTING, AND PACKING COINS

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Fig. 5

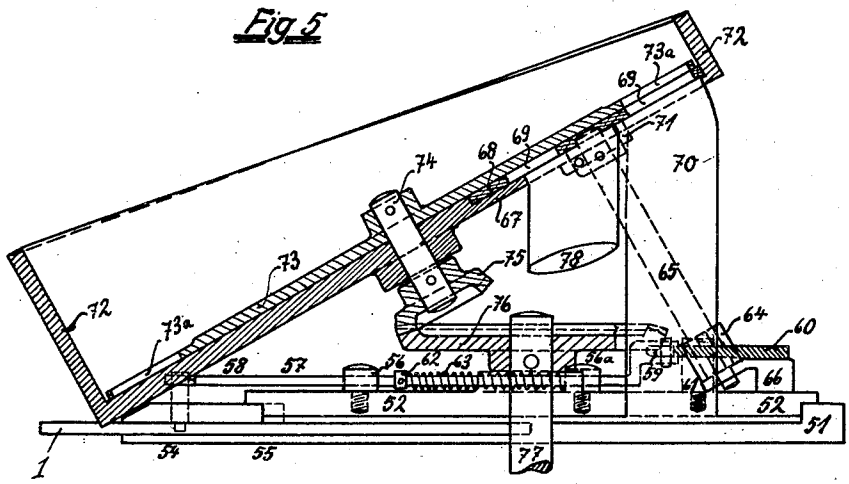
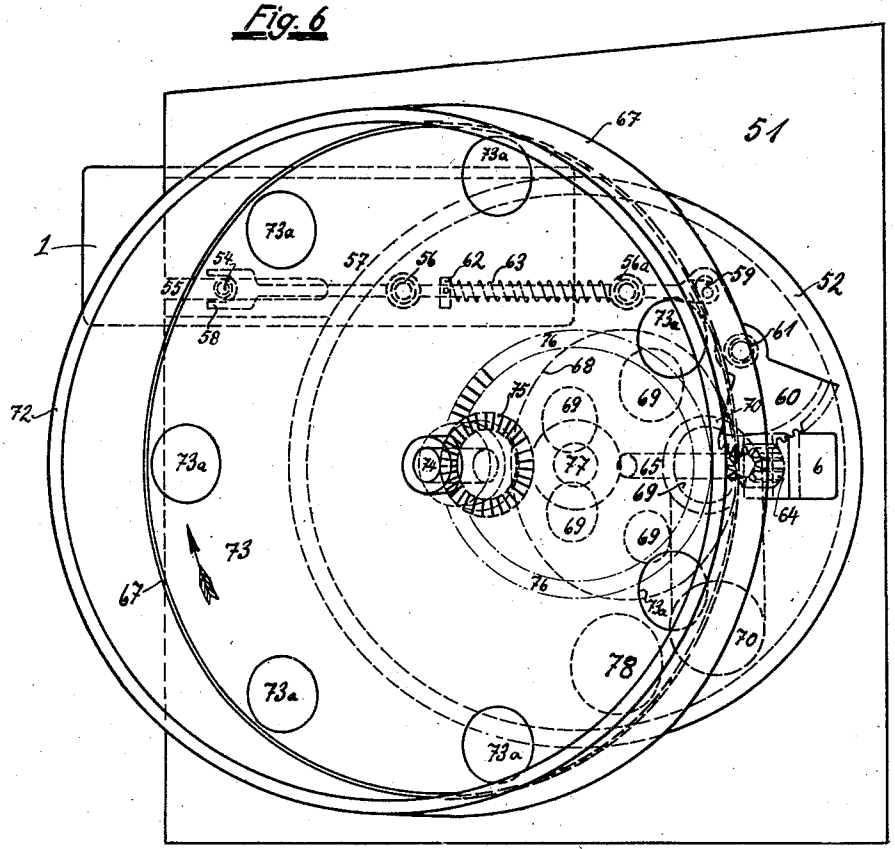


Fig. 6



Inventor:
Siegmund Chiger,
By Cooper Stevens
Atty.

Patented Apr. 5, 1932 1,852,106

UNITED STATES PATENT OFFICE

SIEGMUND CHIGER, OF BERLIN, GERMANY, ASSIGNOR TO FIRM: G. Z. M. PATENT-VERWERTUNG AKTIENGESELLSCHAFT, OF GLARUS, SWITZERLAND

MACHINE FOR SORTING, COUNTING AND PACKING COINS

Application filed November 16, 1929. Serial No. 407,621.

This invention relates to a mechanism for sorting and counting coins, and has for its general object to provide a mechanism of this character which is operable to segregate from a quantity of promiscuously intermingled coins of various different diameters, only coins of a certain diameter, to count the segregated coins, and, when the segregation and counting of the coins of a certain diameter has been completed, and while the mechanism is being restored to a normal position, to effect printing of a sheet with data indicative of the number of coins segregated and the denomination of such coins.

According to the present invention, the mechanism is adapted to be used first to segregate coins of one size, and then coins of another size, and so on, from a quantity of promiscuously intermingled coins of various different diameters, until all of the coins have been segregated and counted, and in this connection another object of the invention is to provide means whereby the mechanism may readily be adapted to segregate coins of any selected diameter from a quantity of promiscuously intermingled coins of different diameters.

Another object of the invention is to provide means whereby setting of the mechanism for the sorting and counting of coins of any selected diameter, automatically locks the mechanism against possibility of any coins other than those of the selected diameter being segregated and counted.

With the foregoing and various other objects in view which will become readily apparent to those skilled in the art to which the invention appertains as the nature of the invention is more fully understood, the same consists in the novel features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings and defined in the appended claims.

In the drawings, wherein like characters of reference denote corresponding parts in the different views:

Figure 1 is a top plan view of a coin sorting and counting mechanism constructed in accordance with the invention, that part of the coin sorting mechanism which is adapted to reject coins of greater diameter than the coins selected to be segregated and counted being removed to better illustrate the coin counting mechanism and the mechanism for rejecting coins of less diameter than the coins selected to be segregated and counted.

Figure 2 is a view partly in side elevation and partly in longitudinal section of the mechanism shown in Figure 1, taken approximately on the line 2—2 of Figure 1.

Figure 3 is a sectional view of a crank employed for restoring the mechanism shown in Figures 1 and 2 to a normal position upon completion of the segregation and counting of coins of a selected diameter.

Figure 4 is a detail cross section on the line 4—4 of Figure 2.

Figure 5 is a central, vertical sectional view through the mechanism for rejecting coins of greater diameter than the coins selected to be segregated and counted; and

Figure 6 is a top plan view of the mechanism illustrated in Figure 5.

Referring in detail to the practical embodiment of the invention illustrated in the drawings, and with particular reference to Figures 5 and 6, wherein is illustrated that part of the mechanism which initially handles the coins, 51 designates a platform or support on which is mounted, in any suitable manner, a hopper 72 into which the promiscuously intermingled coins of different diameters to be sorted and counted are adapted to be placed. This hopper is of circular shape and is disposed with its bottom wall 67 inclined as shown, whereby the coins are caused to collect in the lowermost portion thereof.

A stub shaft 74 extends through the bottom wall 67 of the hopper centrally thereof and has fixed thereto, within the hopper, a disk 73 which is of substantially the same diameter as the inside of the hopper and which is disposed with its under face in close relation to the upper face of the bottom wall of the hopper. Formed through said disk, at circumferentially spaced points, is a plurality of coin receiving openings 73*a*.

Formed in the highest portion of the bot-

tom wall 67 of the hopper 72, in the upper face of said bottom wall, is a circular recess in which is disposed a disk 68 the upper face of which is flush with the upper face of said bottom wall 67, whereby the disk 73, which is rotatable during the operation of the mechanism, is adapted to wipe across said disk 68. Formed through the disk 68 at circumferentially spaced points is a plurality of openings 69 of different diameters corresponding, respectively, to the diameters of the different sizes of coins to be handled by the mechanism, while extending upward through the bottom wall 67 of the hopper at a point therein such that any one of the openings 69 in the disk 68 may, by rotation of said disk, be brought into alinement therewith, is a coin discharge tube 70.

The disk 73 is adapted to be rotated to convey the coins from the lower portion of the hopper 72 to the upper portion thereof, conveying of the coins being effected by the openings 73 in said disk. That is to say, as the disk rotates, with consequent travel of the openings 73*a* in said disk successively beneath the coins contained in the lower part of the hopper, a coin drops into each opening and is thus carried by the disk to the upper part of the hopper. In this connection it will be observed that the openings 73*a* are disposed at such distances from the center of the disk 73 as to successively aline with the upper open end of the discharge tube 70. Thus it is apparent that if one of the openings 69 in the disk 68 is disposed in alinement with the discharge tube 70, all coins of a diameter that will pass through this opening 69 will drop into the tube 70 as the coin containing openings 73*a* of the disk 73 successively aline with the opening 69 in the disk 68 that is alined with the tube 70, while all coins of a greater diameter than said opening 69 will be carried over said opening by the disk 73.

The disk 73 rotates in the direction of the arrow in Figure 6, and beyond the tube 70, as regards the direction of rotation of said disk, another tube 78 which is of a diameter as great as the openings 73*a* in the disk 73 opens at its upper end through the bottom wall 67 of the hopper at a point such that the openings 73*a* in the disk 73 successively pass thereover, whereby the coins of greater diameter than the effective opening 69 in the disk 68, and that are carried by the disk 73 beyond said opening 69, will gravitate through said tube 78 to any suitable form of collection receptacle arranged therebeneath. In this way, a separation of the coins of greater diameter than the coins of a diameter that will pass through a selected opening 69 in the disk 68 is effected.

At 77 is designated a drive shaft for the disk 73. This shaft extends vertically through the support 51 and at its upper end carries a bevel gear 76 disposed in mesh with a bevel gear 75 carried by the shaft 74, whereby rotation of the drive shaft effects rotation of said disk in an obvious manner.

The disk 68 is carried by the upper end of a shaft 65, the lower end portion of which is journaled in a bearing 66 mounted on the support 51. On said shaft is fixed a pinion 64, and meshing with said pinion is a segmental gear 60 which is pivoted as at 61 and has connected therewith, as at 59, one end of a rod 57 which is slidably mounted in a pair of spaced bearing lugs 56, 56*a* carried by the support 51. Thus, longitudinal movement of said rod is effective to rotatably adjust the disk 68 to bring any selected opening 69 thereof into alinement with the tube 70 as is obvious. A coil spring 63 interposed between the bearing lug 56*a* and a collar 62 on the rod 57 serves to maintain the disk 68 normally in a position with a certain one of the openings thereof in alinement with the tube 70, and inward movement of the rod 57, which is disposed horizontally directly above the support 51 and extends forwardly and rearwardly with respect to the mechanism, thus is effective to bring the openings 69 successively into registration with the tube 70. Said rod is forked or otherwise suitably formed at its front end, as at 58, for a purpose which will later appear.

Referring now to the mechanism illustrated in Figures 1 to 4 for separating the coins of smaller size from the coins of the size selected to be segregated and counted, it will be observed that said mechanism is mounted substantially in its entirety between upper and lower supports 51, 51*a*, the former of which corresponds to the support 51 shown in Figure 5 of the drawings. It may here be stated that the mechanism illustrated in Figures 5 and 6 is disposed above the mechanism illustrated in Figure 1 with the coin discharge tube 70 in discharging relation to a circular recess 51*b* formed in the upper face of the support 51 concentric with the shaft 77, so that the coins which drop through said tube 70 are delivered to said recess 51*b*.

On the shaft 77, within the recess 51*b*, is fixed a disk 77*a* of less diameter than said recess, while projecting radially from said disk is one or more pusher fingers 77*b*. The coins are delivered from the tube 70 between the edge of the disk 77*a* and the adjacent side wall of the recess 51*b* and thus, as said disk rotates with the shaft 77, the coins are pushed around said recess by the finger or fingers 77*b*.

The support 51 is recessed as at 1*a* to selectively receive any one of a series of sorting plates, one of which is illustrated in the drawings and designated as 1 in each of Figures 1, 2, 5 and 6. These plates, which are of elongated rectangular shape and all of the same size, are slidably engageable in and removable from the recess 1*a* and when any

one of the same is engaged in said recess the upper face thereof is disposed flush with the upper face of the bottom wall of the recess 51*b*, thereby forming in effect a continuation of said bottom wall. Each plate 1 has formed therethrough a pair of spaced openings 80, 80*a* so arranged with respect to their related plate as to aline with the space between the edge of the disk 77*a* and the side wall of the recess 51*b* when the plate is operatively positioned within the recess 1*a*. The openings 80, 80*a* in the different plates 1 are of varying sizes and in each individual plate the opening 80 over which the coins pushed by the fingers 77*b* of the disk 77*a* first pass is of slightly less diameter than the opening 80*a* with which the coins last aline. The opening 80*a* in each separate plate corresponds in diameter to the diameter of a different size coin, and thus it is apparent that when a given plate 1 is placed in the recess 1*a*, all coins of a diameter less than the diameter of the opening 80*a* will drop through the opening 80, while all coins of a diameter corresponding to the opening 80*a* will pass over said opening 80 and drop through the opening 80*a*. Thus, a separation of the coins that are smaller in diameter than the coins selected to be segregated and counted is effected, the coins after dropping through the respective openings 80, 80*a* being separately collected in any suitable manner.

Carried by each plate 1 is an upwardly projecting pin 54 which is adapted, by insertion of the plate into the recess 1*a*, to engage the forked end 58 of the rod 57 and effect inward movement of said rod, thereby to effect rotatable adjustment of the disk 68. In this connection it is pointed out that the number of plates 1 corresponds to the number of openings 69 in the disk 68, that the opening 80*a* in each individual plate is of the same diameter as one of the openings 69 in said disk 68, and the pin 54 of each individual plate is so disposed relative to the openings therein as to effect alinement of the opening 69 in the disk 68 corresponding to the opening 80*a* in the plate, with the tube 70 when the plate is in a fully inserted position within the recess 1*a*. Thus, the largest coins that drop through the tube 70 also drop through the opening 80*a* in the plate 1, while all smaller coins drop through the opening 80 in said plate.

On the upper end of a shaft 33 which is mounted vertically between the supports 51, 51*a*, is secured a counting wheel 38 which is provided with a series of peripheral recesses and which is disposed with its peripheral portion extending into the recess 51*b* between the openings 80, 80*a* of any selected plate 1 which may be disposed in the recess 1*a*, whereby each coin that passes over the opening 80 in the plate effects partial rotation of said counting wheel and the shaft 33 carrying the same. In the present instance ten peripheral recesses are formed in the wheel 38 and thus one complete revolution of the shaft 33 is effected by the passing of ten coins to the opening 80*a*.

The shaft 33 carries counting devices 8 and 31 of a known type consisting essentially of cooperating disks carrying printing numerals on their edges, which numerals indicate in known manner the number of coins passing the wheel 38 and dropping through the opening 80*a* in any given plate 1.

Mounted loosely on the shaft 33 for rotation with respect thereto is a drum 14 on the surface of which are printing characters corresponding to the different kinds of coins to be handled by the mechanism. Fixed to this drum is a gear 13 with which meshes a gear 12 that is carried by the lower end of a shaft 11, an upper portion of which carries an arm 10 that extends laterally across the recess 1*a* in the support 51 slightly below said recess. A spring 10*a* disposed between the arm 10 and a fixed pin 10*b* serves to maintain the drum 14 normally in a predetermined angular or rotated position. On the other hand, each plate 1 is provided with a depending pin 9 for engagement with the arm 10 to effect a predetermined amount of swinging movement thereof by insertion of any given plate in the recess 1*a*, and in this connection it is pointed out that the pin 9 of each plate 1 is so disposed relatively to the openings 80, 80*a* therein as to produce, through the arm 10, the shaft 11 and the gears 12 and 13, an amount of rotation of the drum 14 to bring into a printing position the printing characters thereof which are indicative of the coins corresponding in diameter to the opening 80*a* in the plate 1.

At 28 and 29 is designated a pair of cooperating feed rolls for a web or webs of paper or the like 30, which latter extends across the disks of the counting devices 8 and 31 and the drum 14 and is adapted, upon completion of sorting and counting coins of any given size, to be pressed against said disks and drum in any suitable manner not entering into the present invention and, therefore, not shown, whereby a printed record of the number and character of the coins of any given size sorted and counted by the mechanism is produced.

A feature of the invention resides in the provision of means for resetting the disks of the counting devices to zero and for advancing the web or webs 30 following each separate sorting and counting operation. Comprising this means is a vertical shaft 22 on which is mounted a gear segment 26 which is normally spaced from a cooperating gear wheel 32 which is loose on the shaft 33 and which following a predetermined amount of rotation of said gear segment, is adapted to be engaged and rotated by said gear segment.

The gear wheel 32 carries a pawl 35 and the shaft 33 has a notch 36 formed therein to be engaged by said pawl, the notch being so positioned relative to the counting devices 8 and 31, and the effective toothed surface of the segment 26 being of such length, that regardless of the positions of the counting devices, the amount of rotation imparted to the gear wheel 32 by a complete rotary movement of the segment is effective to restore the counting devices to zero position.

The web feed rolls 28 and 29 are geared together by gear wheels 41 and 43 and one of said feed rolls is segmentally recessed as at 44 whereby a small amount of rotary movement of said rolls may initially take place without effecting feeding of the strip or strips 30. Meshing with a gear wheel 42 carried by one of said rolls is an idler gear 27 with which the segment 26 normally is in mesh at its advance end as regards its direction of rotation. The means (not shown) for pressing the web or webs 30 against the printing devices 8, 14 and 31 preferably is arranged to be actuated by the shaft 22, and due to the segmental cut away portion of the roll 28 it follows that initial rotation of the shaft 22 may be made effective to actuate the web pressing means without at the same time advancing the web.

A worm wheel 23 is mounted on the shaft 22 and meshing with this worm wheel is a worm 25 that is carried by a horizontal shaft 16 suitably mounted beneath the support 51. A pawl 20 is pressed by a spring 20*a* into engagement with the shaft 22 and said shaft is provided with a notch 21 into which said pawl is adapted to drop to prevent further rotation of said shaft following restoration of the counting devices to zero and after the segment 26 has reached its normal position with the advance end thereof in engagement with the gear 27.

The end of the shaft 16 is notched as at 19 and a handle element 15 as shown in Figure 3 is provided with a hollow hub portion 46 to be engaged over said shaft and with a pin 18 to engage the notch 19 of the shaft whereby rotation of said shaft is adapted to be effected.

At 2 is designated a pivotal locking pawl for the slides 1. Each slide is provided with a notch 3 and when any given slide is engaged in the recess 1*a* the locking pawl 2 is adapted to snap into the notch 3 of the plate 1 to lock the same against withdrawal. An end of the pawl 2 extends in proximity to the shaft 16 and the hub of the handle 15 is provided with a formation 46*a* which is operable, during initial rotary movement of said handle, to engage the said end of said pawl and to effect swinging movement thereof out of the notch 3. Only in this way is the pawl 2 disengageable from said notch, and thus it follows that upon completion of the sorting and counting of coins of any particular denomination, the slide 1 cannot be removed until a printed record of the number of coins that have been sorted and counted has been made.

After coins of one denomination have been sorted and counted, a new slide 1 for coins of another denomination is used to replace the slide previously used and the operation is thus repeated for coins of other denominations.

The complete operation of the mechanism is as follows:—A slide 1, the opening 80^a of which corresponds in diameter to the diameter of a definite coin to be sorted, is inserted into the recess 1^a and becomes locked therein by the pawl 2. As the slide 1 is inserted into the recess 1^a the pin 54 of the slide engages the forked end 58 of the rod 57 and through said rod and its connection with the disk 68 rotates said disk to bring the opening 69 therein corresponding in diameter to the opening 80^a in the slide into registration with the coin discharge tube 70. Also during insertion of the slide the pin 9 thereof engages the arm 10 and through said arm and its connection with the drum 14 rotates said drum to bring into a printing position the printing characters thereof which are indicative of the denomination of the coins corresponding in diameter to the opening 80^a in the slide. The mechanism now being in readiness for operation, the coins to be sorted and counted are deposited in the hopper 72 and power is applied to the shaft 77 to rotate the disks 73 and 77^a. As the disk 73 rotates, the individual coins by reason of becoming pocketed in the openings 73^a of said disk, are moved first over the opening 69 in the disk 68 that is in register with the tube 70 and all coins of a diameter that will pass through the opening 69 gravitate through said tube into the recess 51^b of the support 51. On the other hand, all coins of a diameter greater than the opening 69 in the disk 68 will be moved by the disk 73 across the opening 69 and finally into register with the tube 78, through which tube they will gravitate into a suitable collection receptacle for subsequent sorting and counting.

As the coins which gravitate through the tube 70 drop into the recess 51^b, they are engaged by the fingers 77^b of the rotating disk 77^a and pushed by said fingers around said recess and across the slide 1, the coins of smaller diameter than the opening 80^a dropping through the opening 80 and the coins of larger diameter than the opening 80 being pushed over said opening to the opening 80^a through which they drop for collection in any suitable manner.

As each coin that is of larger diameter than the opening 80 moves from said opening towards the opening 80^a it engages one of the peripheral recesses in the wheel 38 and

imparts in the present instance a tenth part of a complete rotation to said wheel. Thus, due to the connection of said wheel with the counting mechanism 8—31, the coins that drop through the opening 80ª are counted and the printing characters on the counting disks indicative of the number of the coins counted are brought into printing position.

Upon completion of sorting and counting a given batch of coins, the handle device 15 is applied to the shaft 16 and rotated to actuate the printing mechanism and to restore the mechanism to zero position in the manner previously stated, the lug 46ª of the handle device effecting release of the locking pawl 2 after the printing operation has been completed whereby the slide 1 may then be withdrawn and a new slide inserted for the sorting and counting of coins of another denomination.

From the foregoing description considered in connection with the accompanying drawings, it is believed that the construction, operation and advantages of the present mechanism will be clearly understood. It is desired to point out, however, that while a single specific embodiment only of the mechanism has been herein illustrated and described, the invention is capable of embodiment in various other mechanical structures within the spirit and scope of the invention as defined in the appended claims.

I claim:

1. In a mechanism of the character described, coin sorting means comprising a movable member having a plurality of openings therein corresponding in diameter to the diameter of coins of different denominations, respectively, a slide element adapted to be positioned in operative relation to the mechanism and having a pair of openings therein, one corresponding in diameter to one of the openings in said member and to a selected size of coin to be sorted and the other being of smaller diameter, means whereby operative positioning of said slide element moves said member to dispose the opening therein corresponding to the first mentioned opening in the slide element in a position to permit coins moved over said opening to drop therethrough, means for moving the coins over said member, and means for moving the coins that drop through said opening first over the smaller and then over the larger opening in said slide element.

2. In a mechanism of the character described, means for separating from a quantity of coins all coins of greater diameter than a selected size to be segregated, an element adapted to be positioned in operative relation to the mechanism and having a pair of openings therein, one corresponding in diameter to a selected size of coin to be sorted and the other being of smaller diameter, means whereby operative positioning of said element adjusts said first mentioned means to render the same effective to eliminate all coins of a diameter greater in diameter than the larger opening in said elements, and means for moving the remaining coins first over the smaller and then over the larger opening in said element whereby the coins of less diameter than the larger opening in said element are adapted to drop through the smaller opening in said element to thus be eliminated.

3. In a mechanism of the character described, a hopper having a pair of openings in the bottom thereof, a disk rotatably mounted in the bottom of said hopper and having an annular series of openings formed therethrough adapted by rotation of said disk to be moved successively over the openings in the hopper bottom, a second disk rotatably disposed beneath said first disk and having an annular series of openings formed therethrough corresponding in diameter to coins of different denominations, respectively, and adapted by rotation of said disk to be moved selectively into registration with one of the openings in said hopper bottom, an element adapted to be positioned in operative relation to the mechanism and having a pair of openings therein, one corresponding in diameter to a coin of given diameter and the other being of slightly smaller diameter, means whereby operative positioning of said element rotates the second mentioned disk to aline the opening therein corresponding in diameter with the larger opening in the element with one of the openings in the hopper bottom, means for rotating the first mentioned disk to convey the coins whereby the coins of the same and smaller diameter than the effective opening in the second mentioned disk are adapted to drop through the effective opening therein and whereby the coins of larger diameter are adapted to drop through the other opening in the hopper bottom, and means for moving the coins that drop through the effective opening in the second mentioned disk first over the smaller and then over the larger opening in said element, whereby the coins of smaller diameter than the larger opening in said element are adapted to drop through said smaller opening thus to be separated from the coins of a diameter corresponding to the diameter of the larger opening.

4. In a mechanism of the character described, means for separating from a quantity of coins all coins of greater diameter than a selected size to be segregated, an element adapted to be positioned in operative relation to the mechanism and having an opening therein of a diameter slightly less than the coin of a selected size to be segregated, means whereby operative positioning of said element adjusts said first mentioned means to render the same effective to elim-

inate all coins of a diameter greater than the selected diameter, and means for moving the remaining coins over the opening in said plate whereby coins of less diameter than the selected diameter are adapted to drop through said opening thus to be eliminated.

5. In a mechanism as set forth in claim 4, a printing drum having printing characters corresponding to coins of different denominations, and means whereby operative positioning of said element actuates said drum to move to a printing position the printing characters thereof corresponding to the coin of selected size to be sorted.

In testimony whereof I affix my signature.

SIEGMUND CHIGER.