

May 12, 1959

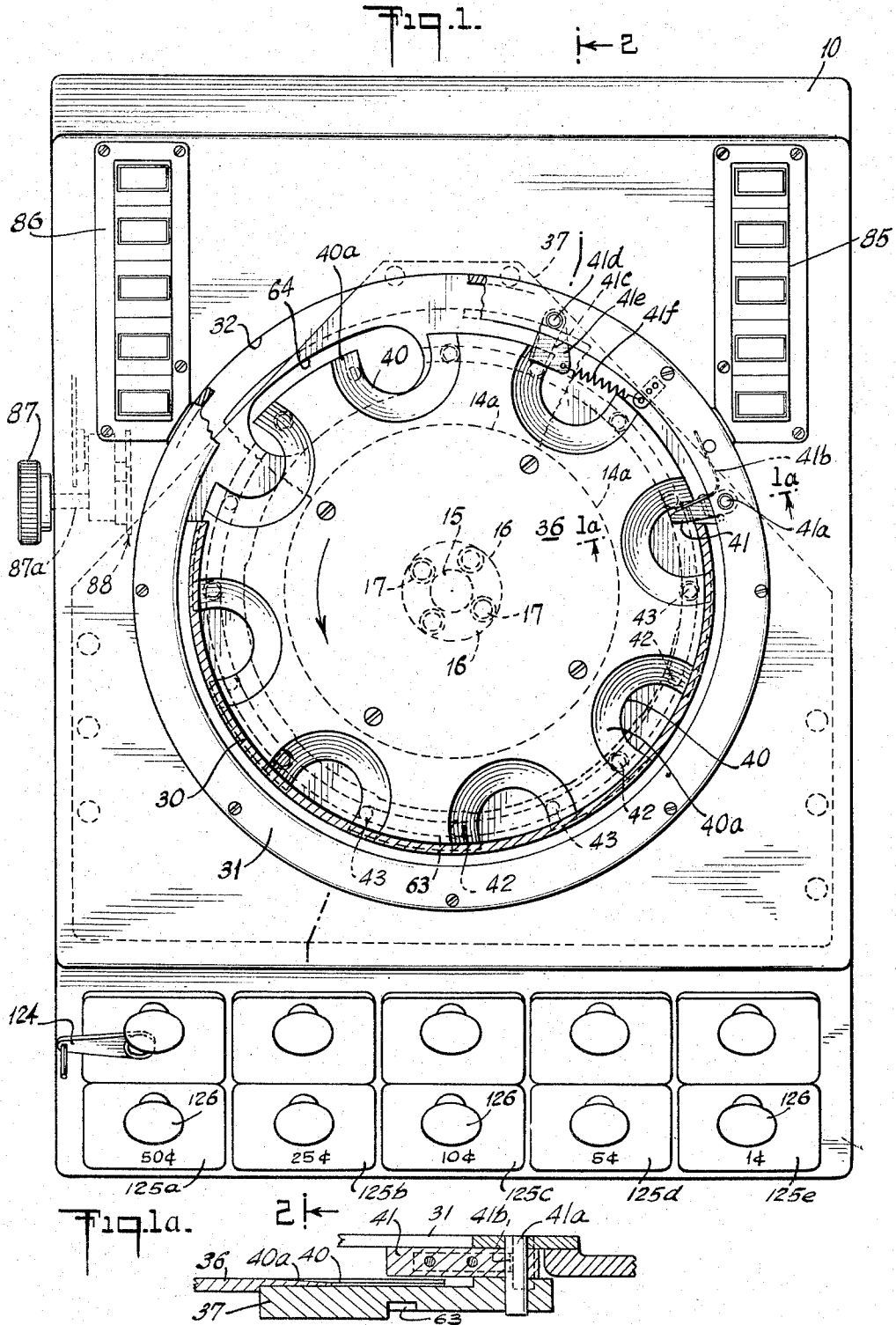
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COIN SORTING AND COUNTING MACHINE

Filed Feb. 16, 1954

8 Sheets-Sheet 1



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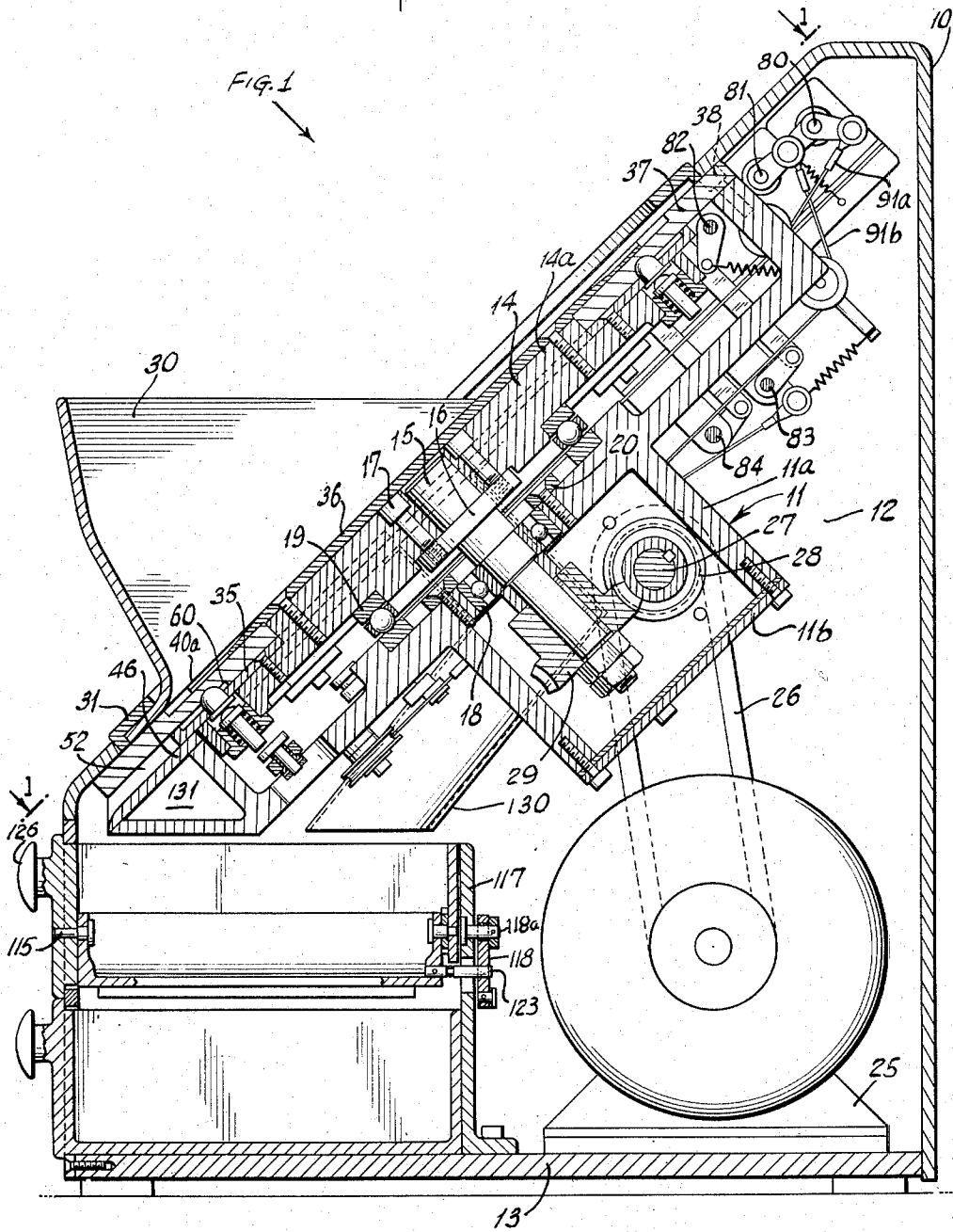
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FIG. 2.



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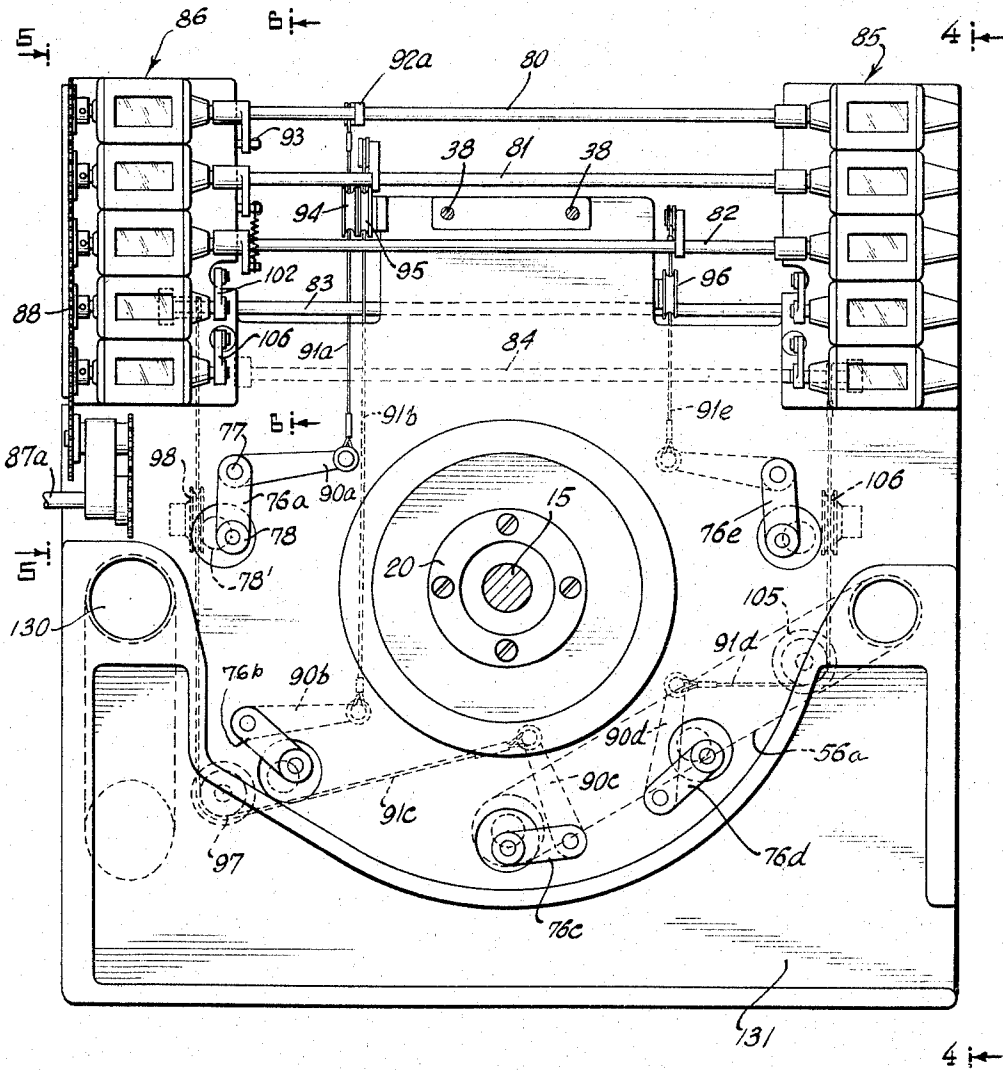


Fig. 3.

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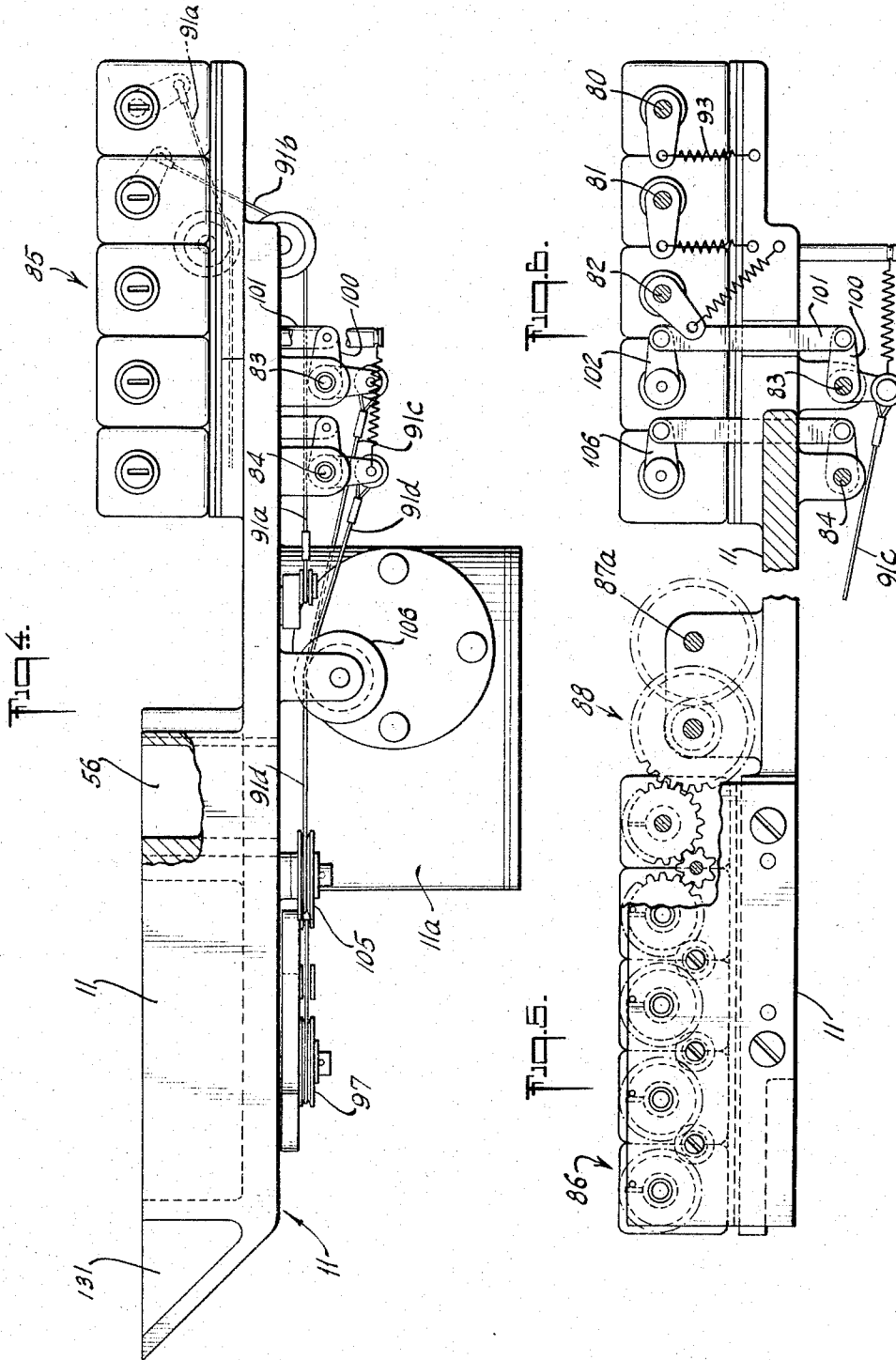
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COIN SORTING AND COUNTING MACHINE

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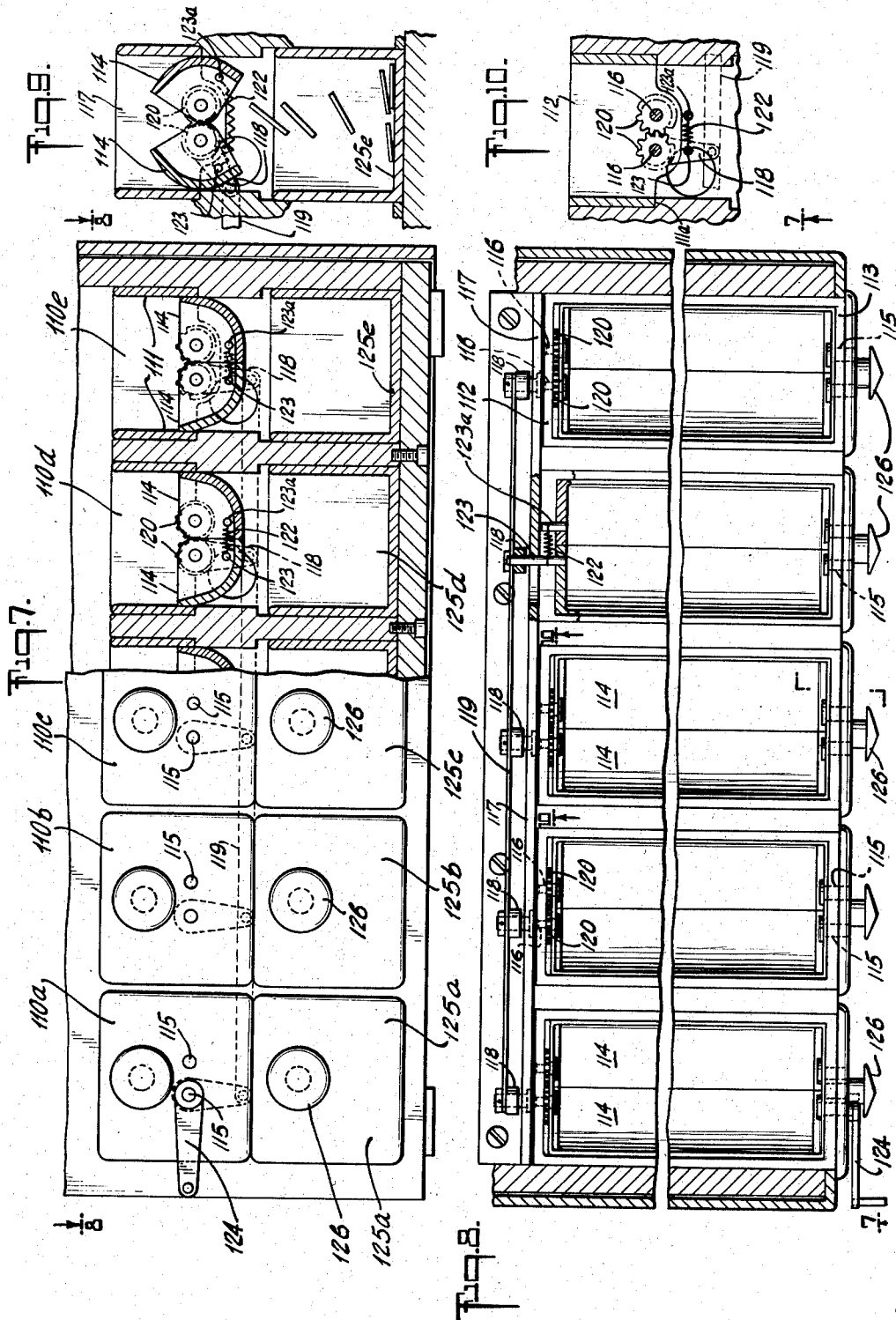
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COIN SORTING AND COUNTING MACHINE

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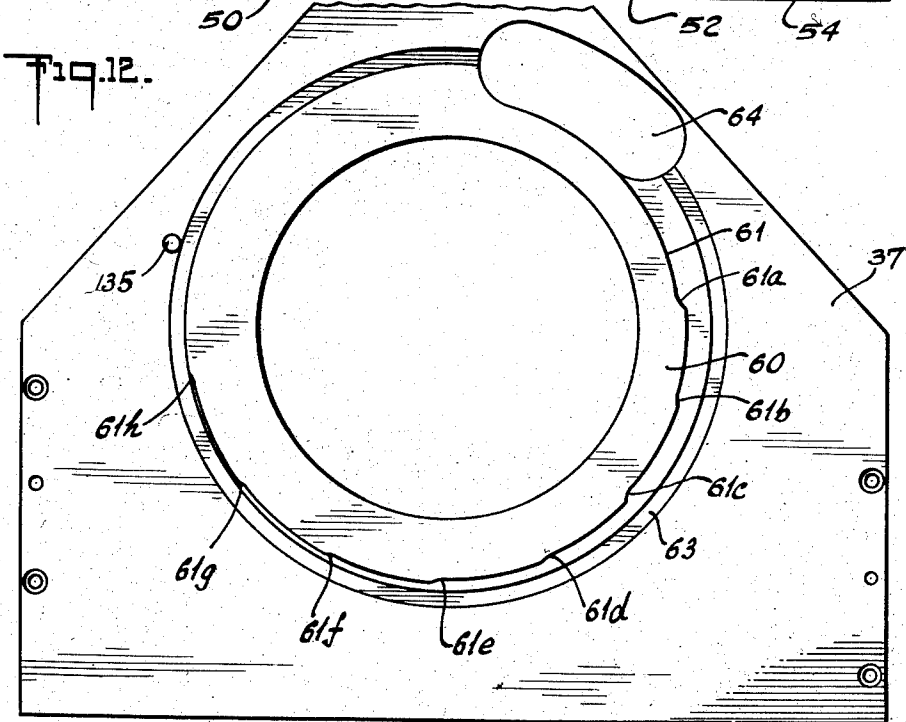
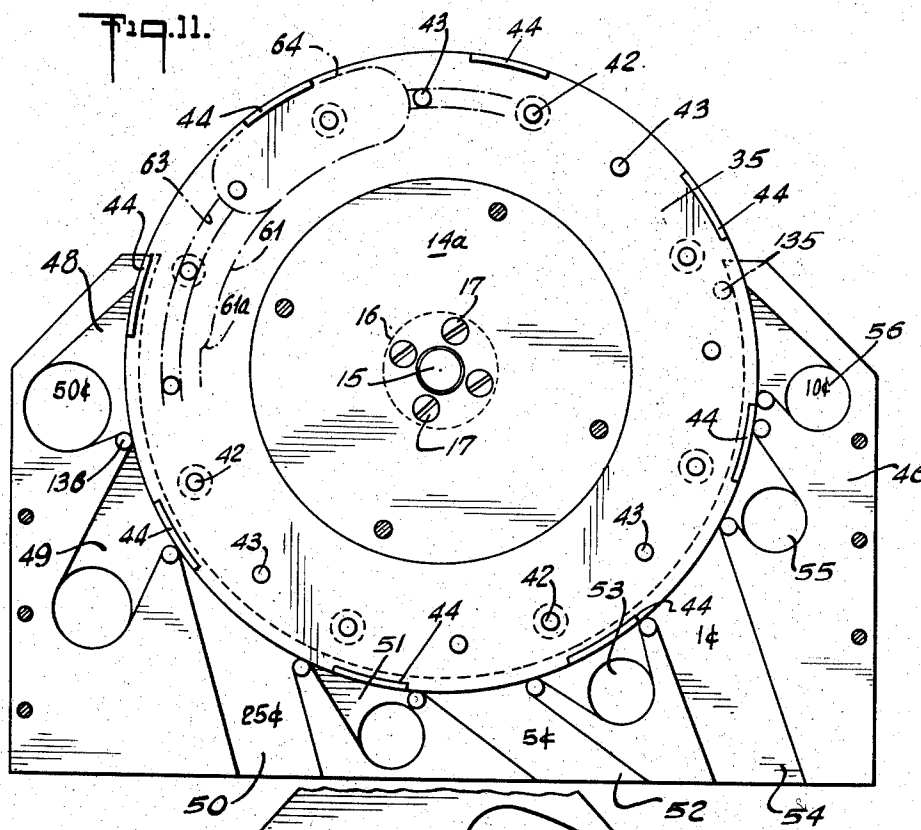
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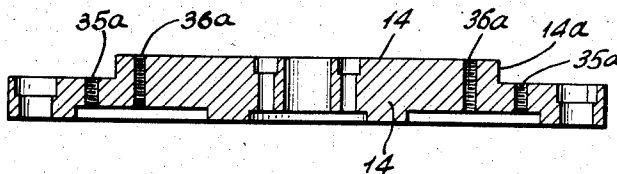
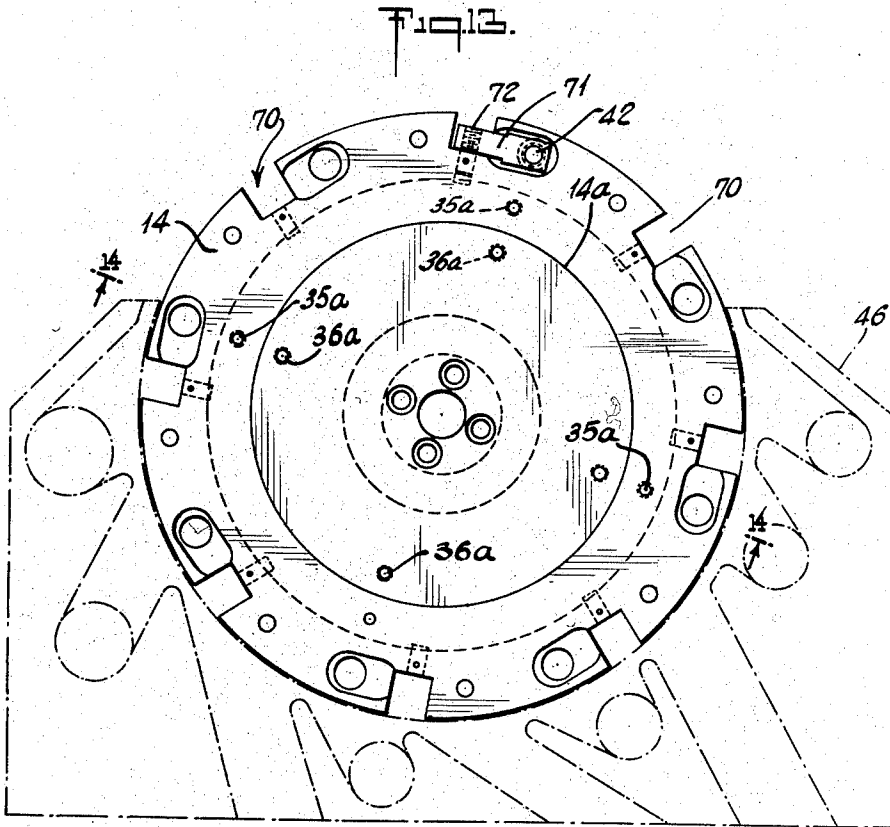


Fig. 14.

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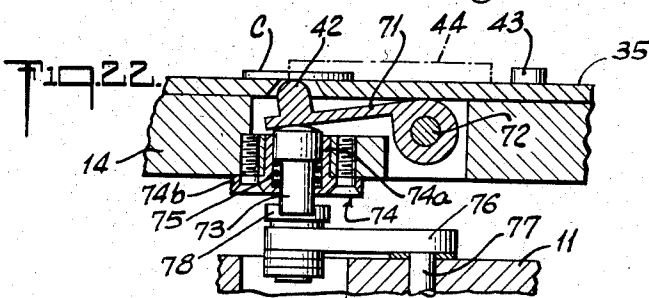
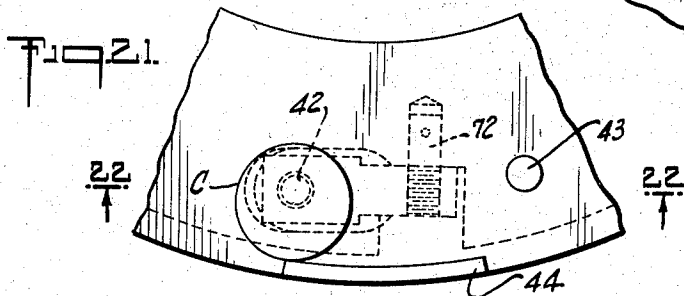
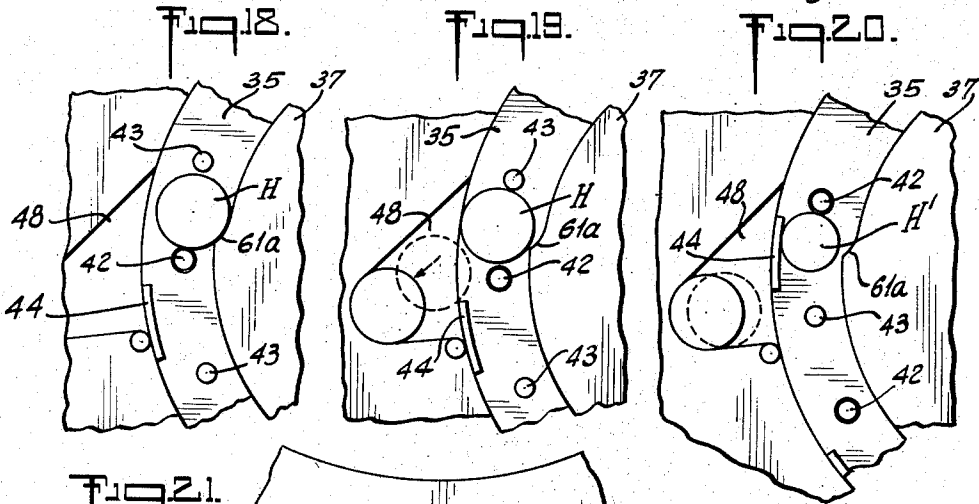
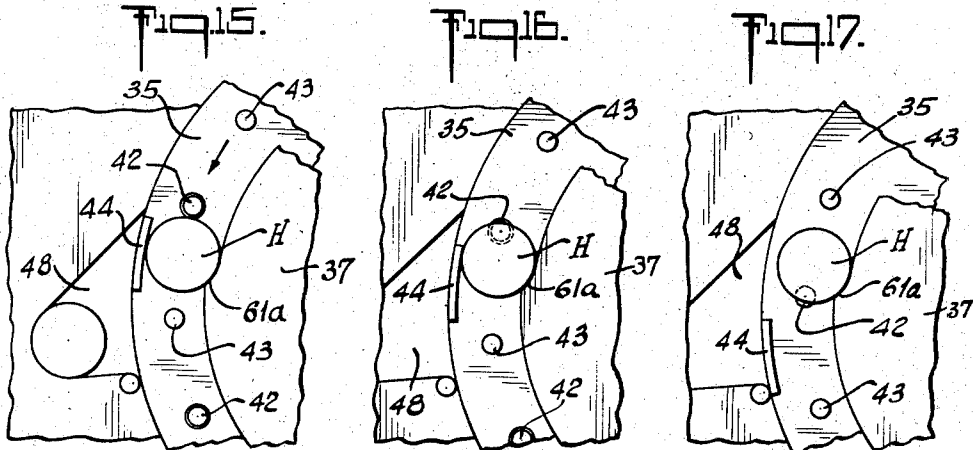
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COIN SORTING AND COUNTING MACHINE

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COIN SORTING AND COUNTING MACHINE

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Application February 16, 1954, Serial No. 410,503

16 Claims. (Cl. 133—3)

The invention is concerned with coin handling devices and particularly with a coin sorting and counting machine in which a rotary coin handling head and associated elements are adapted to sort the coins and deliver the respective denominations to separate compartments, and concurrently to count the coins of the respective denominations.

Such type of machine is well known in general, but the machine of the present invention embodies a new principle of operation in which, according to the specific form shown, the coins are handled by a pair of rotary plates with an intervening stationary gage plate, the advance, counting, and selective delivery of the coins being effected by a special arrangement of retractable and rigid abutments carried by the lower coin carrying plate, the retractable abutments being effective to deliver impulses to the counter mechanism and the rigid abutments serving to direct the coins into the respective appropriate discharge passages and receptacles. The system is marked by sharp discrimination in the sorting of the coins and the separation therefrom of odd size or foreign coins or objects having a diameter between those of standard coins.

The objects of the invention include an improved form of operating connection to the counter units embodying an arrangement of flexible steel cables and pulleys for transferring the counting impulses which contribute to the simplicity and compactness. The machine may be readily converted with a minimum of change to handle different coins and a different range of coins. The driving gearing is compactly arranged in a fully enclosed sealed permanently lubricated housing part.

The machine as a whole is particularly marked by its compactness, simplicity and relatively light weight, many of the bulky parts and linkage mechanisms characterizing previous devices for the purpose being eliminated or reduced.

The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts, which will be exemplified in the constructions hereinafter set forth, and the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Fig. 1 is a view looking perpendicular to the inclined coin plates, with the hopper cut away as indicated on the line 1—1 of Figure 2;

Fig. 1a is a fragmentary section on the line 1a—1a of Figure 1 showing details of the coin whisker means;

Fig. 2 is a vertical section on substantially the line 2—2 of Figure 1;

Fig. 3 is a section showing the counter operating connections;

Fig. 4 is a side view looking from the right in Figure 3 of the main supporting frame for the rotary parts show-

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ing particularly some of the counter operating connections;

Fig. 5 is a fragmentary view of the counter mechanism looking from the left in Figure 3, as indicated by the line 5—5;

Fig. 6 is a fragmentary cross section taken on the line 6—6 of Figure 3;

Fig. 7 is a front elevation of the coin drawers partly in section, as indicated by the line 7—7 of Figure 8;

Fig. 8 is a horizontal section looking down on the upper coin boxes on the line 8—8 of Figure 7;

Fig. 9 shows the jaws of the upper coin compartments in open dumping position;

Fig. 10 is a detail fragmentary view on the line 10—10 of Figure 8 showing the geared connection at the rear between trunnions of the jaws of an upper coin compartment;

Fig. 11 is a plan view looking down on the surface of the lower rotary coin carrying plate;

Fig. 12 is a view looking upward at the bottom of the stationary gage plate;

Fig. 13 is a top plan view of the main rotary table with the coin carrying plates omitted, and with the stationary coin sorting plate indicated somewhat diagrammatically;

Fig. 14 is a cross sectional view of the rotary table taken on the line 14—14 of Figure 13;

Figs. 15 to 20 are fragmentary views showing the progressive steps in the advance and registration of a coin and its delivery into a collection chute;

Fig. 21 is a fragmentary view showing a coin in plan in counter registering position; and,

Fig. 22 is a fragmentary sectional view on the line 22—22 of Figure 21.

The embodiment of the invention in the specific form shown in the drawings includes an outer shell or casing 10 having therein a main frame or inner housing 11 secured to and supported on a pair of side plates, of which one is indicated at 12 (Fig. 2), supported on and extending upwardly from the base plate 13. A main rotary table 14 is mounted on an inclined axis in the main frame the angle preferably being at about 45° to the horizontal. The mounting for the table includes a central stub shaft 15 having a flange 16 to which the table is secured by spaced counter sunk screws 17. The table and shaft are supported by suitable bearings comprising the radial bearing 18 and the thrust bearing 19. The latter encircles a boss on the lower surface of the rotary table and is seated within an annular flange of the main frame part 11. The radial bearing 18 is secured within its opening in the main frame part by an annular plate 20 secured to the frame part by suitable screws.

The table and parts, carried thereby are adapted to be rotated in a continuous manner from an electric motor 25 mounted within the casing 10 on the base plate 13 having a belt drive 26 to a pulley secured on the transverse shaft 27 to which is also secured a worm 28 meshing with and driving the worm gear 29 secured on the shaft 15 on which the rotary table parts are also secured. The gearing is mounted within a cylindrical extension 11a of the inner housing 11 the extension having a removable cover 11b. As will be apparent from Figures 2 and 4 a very compact arrangement results with the drive gearing fully enclosed and self-lubricating in a small housing part. Suitable means may be included for hand operation, particularly in case of jamming, as for example a hand rotatable part adapted to be clutched into engagement with a projecting end of the shaft 27. The particular details of such an operating connection are not important and are not shown in the drawings.

A coin hopper indicated at 30 in Figure 2 is secured to the front face of the machine by an annular ring 31

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having a flange fitting into the opening 32 of the front face plate. The bottom of the hopper comprises rotary coin carrying parts now to be described. The main rotary table 14 has secured thereto a lower coin carrying plate 35 shown in cross section in Figure 2 and in plan in Figure 11, and an upper coin carrying plate 36. As indicated in Figures 13 and 14 table 14 is provided with an annular series of threaded holes 36a for the reception of screws securing the top plate 36 thereto and a similar series of threaded holes 35a for screws for securing the bottom plate 35 thereto. Sandwiched between the two rotary coin carrying plates is a stationary gage plate 37 having outer portions projecting beyond the rotary plates including an upper portion secured to the outer flange part of the main frame 11 by counter sunk screws 38 (Fig. 2). The general shape of the gage plate may be seen in the bottom plan of Figure 12. The upper coin carrying plate 36 is shown particularly in Figure 1 and, as there indicated, is provided with a series of eight openings or scallops 40 adapted to pick up coins from the hopper and carry them around to the upper part of the machine, as the plates rotate counter clockwise in Figure 1. The openings 40 have a size such as to accommodate the largest coin to be sorted such as a 50¢ piece, but are too small to permit coins of the smallest denominations such as dimes to lie flatwise side by side therein. The area around each scalloped opening is suitably beveled down to a relatively thin edge at the opening as indicated at 40a in Figures 1 and 2. Suitable whisker means which may be located in the path of coins as they are moved around in the scallops serve, in cooperation with the beveled edges, to sweep off any bent coins or upper layer of coins assuring that only one coin remains in any of the openings 40. Such a means is shown particularly in Fig. 1a comprising a finger 41 pivoted on pin 41a urged counter clockwise thereon by a leaf spring 41b. A second similar means may be provided comprising a finger 41c pivoted on pin 41d on which is also mounted a part 41e to which is connected a tension spring 41f. In the present case the lever 41 is designed to remove all extra coins except possibly dimes and lever 41c to remove any remaining extra dimes.

The bottom coin carrying plate 35, shown in plan in Figure 11, is provided with a series of abutments in the form of pins 42 and 43 projecting upwardly therefrom. The pins 42 are retractable being held upwardly by resilient means comprising a spring, as will be described in more detail. The mounting support for the pins including the springs is on the table part 14 but the pins move around with the bottom plate 35. The pins 43 are supported directly on and are rigid with the table 35. The retractable and rigid pins are arranged alternately. Located at the outer edge of the plate 35 are a series of upwardly projecting arc-shaped flange parts 44 adapted to retain the coins against radial movement under conditions to be described. The number of each type of the pins and the number of the flanges 44 are the same as the number of coin openings 40 in the upper plate 36, which in the present machine is eight, and as will appear from a description of the operation the parts have a particular relation to each other.

Located around and conforming to the periphery of the lower major portion of the rotary plate 35 is a stationary coin sorting plate 46 (Figures 2 and 11), having suitable coin passages of the desired number, of which there are nine shown in the present case indicated in Figure 11 successively by the reference characters 48, 49, 50, 51, 52, 53, 54, 55 and 56. These passages comprise milled out flat channels in the upper surface of the sorting plate 46. As will be described more fully hereinafter, the channels communicate downwardly with receiving drawers or a discard chamber in the case of odd size coins.

The intermediate fixed gage plate 37 is shown in bottom plan in Figure 12 and in cross section in Figure 2. It has

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a central opening to receive the reduced diametral portion 14a of the main table part 14 (Figures 2 and 14) and the area immediately surrounding the opening is thicker to provide a downwardly projecting boss 60 (Figs. 2 and 12). The outer edge 61 of the boss forms the inner edge or wall of a coin channel. The edge 61 is stepped successively outwardly by the shoulders 61a, 61b, 61c, 61d, 61e, 61f, 61g and 61h respectively thereby to narrow the channel progressively in the direction of coin travel which in Figure 12 would be clockwise. The gage plate has a groove 63 in its under surface in which the upper ends of the pins 42 and 43 travel, as will be described. The groove 63 is interrupted by an arc-shaped opening 64 extending through the gage plate. The opening is shown in full lines in Figures 1 and 12, and is shown superimposed in broken lines in Figure 11 to indicate its relation to the bottom coin carrying plate 35. In the normal operation coins are carried around by the upper coin carrying plate 36 in the scalloped openings 40 to the upper area where they drop through the opening 64 in the gage plate onto the upper surface of the bottom coin carrying plate 35 in advance of one of the displaceable pins 42.

The major coin contacting parts and particularly the upper and lower plates 36 and 35, the gage plate 37 and the sorting plate 46 are composed of hardened tool steel to resist wear. The table 14, however, and the major frame parts may be made of a light weight material such as aluminum.

The coin feeler mechanism for detecting coins and causing a registration on the respective counter unit will now be described, reference being had particularly to Figures 13 and 14 showing the table on which the feeler mechanisms are mounted and to Figs. 21 and 22 for details of one of the feeler units. As appears particularly in Figure 13 the table 14 has at its periphery a series of square cut openings 70 of which there are eight in number in the present machine. A feeler unit is mounted in each one of these notches, one such being shown in assembled position at the top in Figure 13 but the others are omitted therefrom. Referring to Figures 21 and 22, the detailed parts of one of the feeler mechanisms includes a lever 71 pivoted on a stud 72 extending substantially radially of the table. The free end of the lever 71 carries a button 42 comprising the retractable abutments heretofore mentioned which project upwardly through holes in the bottom coin plate 35. The lever and corresponding button 42 are normally urged into their uppermost position by a small plunger 73 mounted in a shell 74 having a cylindrical portion 74a mounted in an opening in the table 14 and an outer flange portion 74b through which screws extend for securing the shell 74 in the table. The plunger 73 is vertically slidable in a central opening of the cylindrical portion 74a of the shell, being urged upwardly by a spring 75 bearing against a shoulder provided by the upper enlarged head of the plunger. In Figure 22 the button 42 is shown in its depressed position by reason of a coin C being positioned thereover. Details of the operation will be described more fully hereinafter, but it is here noted that as the table and the feeler mechanisms carried thereby rotate and a coin is stopped by one of the shoulders 61a to 61h of the gage plate, the button 42 is cammed downwardly, it having an upper suitably rounded surface to effect such operation. In the depressed position the plunger 73 projects downwardly a sufficient distance to engage, as the table rotates, a lever pivoted to the stationary frame part. Such a lever is shown at 76 in Figure 22 secured on a shaft 77 mounted in the fixed housing part 11 and carries at its outer end a roller 78 occupying a position in the path of the plunger 73 when the latter is in depressed position.

The actuating unit including the lever 76 and shaft 77 and associated mechanism is connected to one of the counter units and there is one of such actuating units for each of the coin denominations to be sorted and

counted comprising in the present machine five denominations. Accordingly there are shown in Figure 3 five actuating units being arranged in an arc about the center of the main housing and the rotary table parts mounted therein, the actuating levers corresponding to lever 76 of Figure 22 being designated in Figure 5 as 76a, 76b, 76c, 76d and 76e respectively.

The character of the counter mechanism forms no part of the present invention, such devices being well known and commercially available, the type and number of the units selected varying with the circumstances. Accordingly details of the counter mechanism are omitted and the disclosure will be directed to the more important features of the operating connections thereto. As shown particularly in Figures 4 and 6 there are five counter operating shafts 80, 81, 82, 83 and 84 mounted in the upper part of the frame extending transversely thereof. The present machine has a set of counter units at each side. The counter bank 85 at the right, for example, may be accumulative and the bank 86 at the left designed to register sub-totals for a particular coin sorting run. The counter mechanism will include suitable re-set means. The invention is not concerned with the details thereof but there is shown for the bank 86 at the left a knob 87 on shaft 87a connected through suitable gearing indicated generally at 88 (Figures 3 and 5) to the respective units. Likewise the bank 85 is adapted to be re-set as by a standard key means. The units in each bank are adapted to register separately the respective denominations. The cross shaft 80 at the top is connected to register the half dollars at the top units and progressively downwardly the units register quarters, dimes, nickels and pennies being operated from the shafts 81, 82, 83 and 84 respectively. The shafts 80, 81 and 82 are in line with the axes of and are connected directly to their respective units. The shafts 83 and 84 are off-set downwardly from the axes of their respective units and are connected thereto by a short linkage. This counter mechanism may, of course, include a totalizer.

An important feature of the present machine resides in the character of the operating connections to the counter units which embodies therein a flexible cable for delivering impulses from the coin feeler means heretofore described. Referring, for example, to the mechanism (Figure 3) for operating shaft 80 and thereby the half dollar counters, the shaft 77 operated by lever 76a has fixed thereto an arm 90a, and a flexible cable 91a connects the outer end of arm 90a to an arm 92a fixed on shaft 80. When, as a result of a half dollar being in registering position, the roller 78 is moved to the position indicated in broken line at 78', and the arm 76a is angularly moved, the arm 90a pulls the cable 91a to rock shaft 80 clockwise looking from the right as in Figure 6. Suitable spring means is provided such as indicated at 93 in Figure 6 to restore the shaft 80 to its normal position when the pull on the cable is released. The operating connection described is marked by simplicity and economy of manufacture. It is entirely free of back lash and noise such as may occur in linkages or gearing made up of a succession of parts. It enables a more compact arrangement, particularly since the cables may be passed around suitably mounted sheaves to avoid interference with other parts. Cable 91a, for example, extends over a sheave 94 mounted on a fixed axis.

The feeler mechanisms for the other denominations of coins are similarly connected to the respective counter operating cross shafts. The arm 90b located at the quarter station is connected by cable 91b extending over a sheave 95 to an arm fixed on shaft 81. The dime being the smallest in size, the registering mechanism therefor is located at the farther station in the clockwise direction in Figure 3 indicated by the feeler mechanism lever 76e which is connected by cable 91e over sheave 96 to an arm on counter operating shaft 82. Restoring springs for these two shafts 81 and 82 are shown in Figure 6.

The registering mechanism for nickels associated with the lever 76c operates through a lever 90c and a cable 91c extending over sheaves 97 and 98 to an arm mounted on the actuating shaft 83 (Figure 6). In this case, to accommodate various parts, the operating shaft 83 is located in a plane below that of the upper three operating shafts 80, 81 and 82. The respective counter units are operated from the shaft 83 by a linkage such as that shown in Figure 6 for the unit at the left comprising an arm 100 mounted on shaft 83, a connecting link 101 and an arm 102 connected to the shaft of the counter unit at the left in Figure 3. A similar linkage at the right connects the operating shaft 83 to the corresponding counter unit.

The registering mechanism for the pennies, associated with the arm 76d, includes an arm 90d connected by cable 91d over sheaves 105 and 106 to an arm on the operating shaft 84 which, through a linkage mechanism shown in Figure 6 similar to that for the nickel units, operates levers corresponding to that indicated at 106 connected to the respective counter units for pennies.

It has been heretofore described in general that coins are delivered selectively from the coin sorter and counter mechanism into the respective passages in the sorter plate 46 shown particularly in Figure 11. Details of the operation in this regard will be later described, but for the present the description will be directed to the coin collecting compartments. The specific construction may be varied in accordance with the circumstances and requirements of particular sorting and counting jobs, and the number of compartments will depend upon the number of denominations to be sorted. In the present machine, illustrative of the principles involved, there are embodied in the lower part thereof, as shown particularly in Figures 7 and 9, an upper and lower tier of compartments the upper compartments being for the temporary reception and collection of the respective coins which may then, as desired, be dumped into the compartments of the lower tier which comprises drawers adapted to be pulled out with the contents therein.

The compartments in a tier are all alike and a description of one will be sufficient. Referring to Figures 7 to 10 the upper compartments designated 110a to 110e are provided with suitable side walls 111 and a rear wall part 112 and forward wall part 113. The bottom is comprised of a pair of jaws 114 arc-shaped in cross section, as indicated in Figures 7 and 9, each in the nature of a scoop with a front supporting trunnion 115 and a rear supporting trunnion 116 fixed to the respective ends of the particular jaws. The front trunnions are rotatably supported in the forward end wall 113 and the rear trunnions are supported in the rear wall 112. A fixed plate 117 extends along the back of all of the drawers (Figs. 2 and 8). Associated with each upper drawer is a vertical lever 118 pivoted at its lower end to a common long operating link 119 extending across the back, the upper end of the lever in each case being carried on a pivot support 118a carried by the plate 117. The jaw trunnions 116 have fixed thereon a pair of meshing gears 120. Each left hand jaw 114 has in its rear wall a pin 123 extending rearwardly through a large opening in the wall plate 117 and engaged in a hole in the lever 118. A spring 122 has its ends engaged over the pin 123 and a corresponding but shorter pin 123a in the right hand jaw 114 to urge the jaws into closed position. The dumping jaws are therefore all connected together and may be operated from a single lever 124 connected to one of the front trunnions 115 as shown at the left in Figs. 7 and 8. As the jaws are opened along a middle line at the bottom and for the full length, the coins will be more uniformly distributed into the lower drawers. Upon release of the lever 124 the springs 122 automatically close the jaws. The upper drawers are freely removable individually, by pulling on the corresponding knobs without the need of making any preliminary disconnections. The sides 111

of the drawers slide on the supporting shoulders 111a of the casing and the pin connection 123 slides freely out of the hole in the lever 118 (Fig. 2).

The lower compartments each comprises a slide drawer 125a to 125e, and the forward end of each drawer is provided with a suitable knob 126 for its withdrawal.

The compartments, shown in Figures 7 and 8, are designed for the collection of half dollars at the extreme left and progressively decreasing denomination to the collection of pennies at the extreme right. The discharge passage 48 shown in Figure 11 communicates with a chute 130 (Figure 2) which, as shown, is positioned to lead the half dollars into the upper compartment 110a. The coin passage 50 for quarters (Figure 11) is designed to direct such coins into the compartment 110b. The passage 56 for dimes connects with a chute 56a (Figures 3 and 11) similar to that shown at 130 but which crosses over to the middle and directs the dimes into the middle compartment 110c. The passage 52 for nickels leads to the compartment 110d, and the passage 54 leads to the compartment 110e for pennies.

An important feature of the present invention and the present structural embodiment thereof includes means for sorting out odd sized coins or objects having a diameter between standard denominations or sizes. This will be described more in detail in connection with a typical operation, but for the moment it is noted that the passage 49 (Fig. 11) is adapted to receive coins or objects of a diameter between those of half dollars and quarters; passage 51 objects having a diameter between those of a quarter and a nickel; passage 53 objects having a diameter between those of a nickel and a penny; and passage 55 objects having a diameter between those of a penny and a dime. Each of the passages 49, 51, 53 and 55 for the odd sized coins leads into a discard chamber which in the present construction comprises that indicated at 131 (Figures 2 and 4) which extends across the bottom of the main frame or housing part 11 from which the discards may, at the convenience of the operator, be raked or dumped out at the side of the machine.

The operation of the machine will be reviewed in connection particularly with the view of Figure 12 and the fragmentary illustrations of Figures 15 to 20. In the beginning a mass of coins is of course dumped into the hopper 30 and the operation started, which means that the coin plate 36 and the lower coin plates and table are continuously rotated in a counter clockwise direction in Figures 1 and 11. Coins are accordingly carried up to the top in the scallops 40 with no more than one coin in each scallop, and when a coin reaches the opening 64 in the stationary gage plate 37 it drops through onto the upper surface of the lower coin carrying plate 35 in front of one of the retractable pins 42. Assuming the particular coin indicated at H is a half dollar, it will be advanced by the pin or abutment 42 along the gaging channel located below the fixed plate 37 to a position shown in Figure 15 where it engages against the stationary shoulder 61a of the gage plate 37 and is stopped temporarily in that position, particularly since radial movement of the coin is prevented by the flange 44 on the bottom coin carrying plate. Accordingly the rotary table and plate continue to advance and the pin 42 is cammed downwardly and advances under the coin as shown in Figures 16 and 17. The downward camming of the pin 42, together with the continued advance of the pin, causes the corresponding plunger 73 to be depressed (Figure 22) and engage the roller 78 on the arm 76a (Figure 3) and the roller to be moved to the position indicated at 78'. This operation, of course, causes a registration on the corresponding counter unit as heretofore described. In the position of Figure 18 the carriers have advanced sufficiently that the retractable abutment 42 is released and the succeeding fixed abutment 43 engages behind the coin H and the flange 44 having progressed beyond the coin, it is free to move radially out-

ward as indicated in Figure 19 into the passage 48 leading to the collection compartment 110a heretofore described. Figure 20 shows the coin plate having advanced sufficiently that the next pin 42 has moved into a position similar to that shown in Figure 15. The coin H' in advance of the particular pin 42 may be another half dollar but in Figure 20 it is indicated to be of some smaller denomination and size such as a quarter in which case it will pass on by the shoulder 61a to the gage shoulder designed to restrain that size coin.

The operation in general is similar for coins of smaller denomination than a half dollar, and likewise for odd sized coins or slugs, except that they progress farther around the gage plate to the appropriate shoulder and discharge passage and, in the case of the odd sized coins, there is no counter feeler mechanism positioned to be operated. It will be recalled that Figure 12 is a bottom view looking upwardly at the gage plate and accordingly it will be noted that the shoulder 61b is designed to engage and direct odd sized coins into the passage 49, shoulder 61c directs quarters into the passage 50, shoulder 61d directs odd sized objects into passage 51, shoulder 61e directs nickels into the passage 52, shoulder 61f directs odd sized objects into the passage 53, shoulder 61g directs pennies into the passage 54, shoulder 61h directs odd sized objects into the passage 55. The remaining coins, which in the present machine should normally be dimes, are all adapted to engage an abutment fixed in the gage plate 37 such as the pin 135 shown in broken line in Fig. 11 for stopping the further progress of any coins and diverting them into the passage 56. The far shoulder point on each of the passages may be provided with a special hardened abutment to resist wear such as an auxiliary pin, one such being indicated at 136 in Figure 11.

In the foregoing specification and in the claims to follow the terms "coin" and "coins" are employed to designate the objects to be sorted and are employed in the description of the machine and parts thereof. It should be understood, however, such terms are used as a matter of convenience and simplification of language and that they are intended to be regarded in the broad sense and to comprehend tokens and generally objects of physically similar disk-like character.

It should also be understood that the description and drawings are directed to one specific form or embodiment of the invention and that various changes may be made therein without departing from the principles or scope of the invention, and it is intended that all matter contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim:

1. In a coin handling device a gage plate having a gaging channel in which the coins are adapted to be advanced edgewise, an endless movable coin feeding means having successive spaced abutments projecting into and movable along said channel and adapted to engage against the edges of the respective coins, said channel having gaging shoulders adapted to stop the advance of coins of different diameters at different positions along the channel, said abutments being resiliently urged into coin feeding position and automatically retractable to permit continued movement of the conveyor when the corresponding coin is stopped, counter means connected to be operated by the retraction of the abutments, and means for discharging the stopped coins from said channel.

2. In a coin sorting and counting device a gage plate having a gaging channel in its under surface in which the coins are adapted to lie flat to be advanced edgewise, a rotary coin feeding table below said plate having successive spaced pins mounted in openings in said table normally projecting into and movable along said channel and adapted to engage against the edges of the

respective coins, said channel having gaging shoulders adapted to stop the advance of coins of different diameters at different positions along the channel, said pins being urged by resilient means upwardly into coin feeding position and having surfaces causing the pins to be cammed downwardly when the corresponding coin is stopped permitting the pin to advance with the table under the coin, counter means connected to be operated by the retraction of the pins, and means for discharging the stopped coins from said channel.

3. In a coin sorting and counting mechanism, a coin gaging means having a channel for the coins, a coin receiving means having a series of discharge passages for coins of different sizes spaced successively along and adapted to communicate with said channel, means for feeding coins along said channel, means for temporarily restraining coins in said channel at positions corresponding respectively to the discharge passage for the particular coin sizes, said feeding means including a series of alternately arranged displaceable and rigid coin feeding abutments, the displaceable abutments being operated when its respective coin is restrained in said channel and the succeeding rigid abutment being effective to move the coin into the corresponding discharge passage, and counting means connected to be actuated by the said displacement operation.

4. In a coin handling device, a coin guiding means having a channel along which coins are adapted to advance said channel having a gaging abutment means against which a coin of predetermined diameter is adapted to engage, a coin receiving means having a coin discharge passage communicating with said channel, a movable coin feeding means including a resiliently supported displaceable first abutment and a positively supported second abutment carried in spaced arrangement thereby, said first abutment being displaced when a predetermined coin is restrained by said gaging abutment and said second abutment acting thereafter in the continued movement of the feeding means to cause the coin to be directed into said discharge mechanism, and operative means connected to be actuated by the displacement of said first abutment.

5. In a coin counting mechanism, a coin guiding means having a channel along which coins are adapted to be advanced said channel having a gaging abutment means against which a coin of predetermined diameter is adapted to engage, a coin receiving means having a coin discharge passage communicating with said channel, a movable means for advancing coins in said channel including a resiliently supported displaceable coin engaging abutment and a rigid abutment both carried seriatim thereby, said displaceable abutment being displaced when a predetermined coin is restrained by said gaging abutment and said rigid abutment acting thereafter in the continued movement of the feeding means to cause the coin to be directed into said discharge mechanism, and counting means connected to be actuated by the said displacement of the said abutment.

6. In a coin handling mechanism, a coin gaging means having a channel along which coins are adapted to advance edgewise, means for feeding coins along said channel, said channel having a side wall with shoulders successively stepped outwardly correspondingly to narrow progressively the channel, said shoulders comprising gaging means for differently sized coins and against which the corresponding coin is adapted to engage and be temporarily restrained, said coin feeding means having a series of displaceable abutments carried thereby and normally urged into a position to engage and advance the coins but adapted to be displaced into an ineffective position when the corresponding coin is temporarily restrained, and means for discharging coins from the channel into a receiving means following the respective said displacement operation.

7. In a coin sorting and counting mechanism a gage plate having a channel in its under surface along which coins may be advanced flatwise, a series of coin receiving passages for coins of different sizes respectively positioned successively along one edge of said channel and communicating therewith, a movable endless coin conveying means positioned below said plate having a series of alternately arranged displaceable and rigid coin feeding abutments carried thereby and projecting upwardly into and movable along said channel with means for supporting coins flatwise between the abutments, said gage plate having an opening for feeding coins therethrough onto said coin conveying means, means for temporarily restraining coins in said channel at positions corresponding respectively to the discharge passage for the particular coin size, the displaceable abutments being operated when its respective coin is restrained in said channel and the succeeding rigid abutment being effective to move the coin into the corresponding discharge passage, and counting means connected to be actuated by the said displacement operation.

8. In a coin counting mechanism, a gage plate means having a channel in which coins are adapted to lie flatwise and be advanced edgewise therealong, a movable endless coin conveyor having a series of pins adapted to project into said channel and engage the edges of and advance the coins, said channel having gaging means for stopping coins at predetermined positions, said pins being mounted in openings in said conveyor and spring pressed into coin feeding position and having cam surfaces for engaging the coins whereby when the respective coin is stopped the pin is depressed into the conveyor and the pin may continue to advance with the conveyor, and counter actuating means having an element positioned to be operated by the depressed pin in its advance.

9. In a coin sorting mechanism a gage plate having an arc-shaped channel in its under surface along which coins may be advanced flatwise, a rotary coin conveying plate positioned below said gage plate having spaced abutments projecting upwardly into and movable along said channel with means for supporting coins flatwise between the abutments, means for feeding coins onto said coin conveying means, a series of coin receiving passages positioned successively along the outer edge of said channel and communicating therewith said channel having at one side coin restraining shoulders narrowing it successively in relation to said passages, alternate ones of said abutments being displaceably supported on said rotary plate, and said latter plate having outer flange parts located opposite the displaceable abutments for holding restrained coins in the channel while the corresponding abutment advances and the succeeding abutment effects the discharge of the coin into the adjacent said passage.

10. In a coin counting mechanism, a gage plate means having a channel in which coins are adapted to be advanced, a movable endless coin conveyor having a series of pins adapted to project into said channel and engage and advance the coins, said channel having gaging means including abutment means for stopping coins at predetermined positions, said pins being mounted in openings in said conveyor and spring pressed into coin feeding position and having cam surfaces for engaging the coins whereby when the respective coin is stopped the pin is depressed into the conveyor and the pin may continue to advance with the conveyor, movably mounted means arranged to be operated by the depressed pin in its advance, counter mechanism, and a flexible operating cable connecting said movably mounted means and said counter mechanism for actuating the latter.

11. In a coin handling means, a coin gaging means having an arc-shaped coin channel along which the coins may be advanced flatwise said channel having an inner side wall against which the coin edges are adapted to engage said wall being successively stepped outwardly to provide shoulders and correspondingly to narrow progres-

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sively the channel and provide selective coin restraining means, a rotary coin feeding plate having spaced coin feeding abutment moveable in and along said channel, said abutments being resiliently urged into coin feeding position and automatically retractable to permit continued movement of the abutment and conveyor when the corresponding coin is stopped, and said plate having rotatable therewith a segmental stop element located at the edge and ahead of each abutment to restrain temporarily the coin against outward radial movement, means for discharging the stopped coins radially outward after said segmental stop has advanced beyond the respective coin, and coin receiving means having a series of coin passages positioned successively along the outer edge of said channel and communicating therewith opposite said shoulders respectively.

12. In a coin handling device a gage plate having a gaging channel in which the coins are adapted to be advanced edgewise, an endless movable coin feeding means having successive spaced abutments projecting into and movable along said channel and adapted to engage against the edges of the respective coins, said channel having gaging shoulders adapted to stop the advance of coins of different diameters at different positions along the channel, a coin receiving means at each of said positions said abutments being resiliently urged into coin feeding position and automatically retractable to permit continued movement of the conveyor when the corresponding coin is stopped, and means for discharging the stopped coins from said channel into the respective said receiving means.

13. In a coin sorting device a gage plate having a gaging channel at its under surface in which the coins are adapted to lie flat to be advanced edgewise, a rotary coin feeding table below said plate having successive spaced pins mounted in openings in said table normally projecting into and movable along said channel and adapted to engage against the edges of the respective coins, said channel having gaging shoulders adapted to stop the advance of coins of different diameters at different positions along the channel, a coin discharge passage associated with each of said positions, said pins being urged by resilient means upwardly into coin feeding position and having surfaces causing the pins to be cammed downwardly when the corresponding coin is stopped permitting the pin to advance with the table under the coin, and means for discharging the stopped coins from said channel into the respective said receptacle.

14. In a coin sorting mechanism, a coin gaging means having a channel for the coins, a coin receiving means having a series of discharge passages for coins of different sizes spaced successively along and adapted to communicate with said channel, means for feeding coins along said channel, means for temporarily restraining coins in said

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channel at positions corresponding respectively to the discharge passage for the particular coin sizes, said feeding means including a series of alternately arranged displaceable and rigid coin feeding abutments, the displaceable abutments being moved to a non-feeding position when its respective coin is restrained in said channel and the succeeding rigid abutment being effective to move the coin into the corresponding discharge passage.

15. In a coin counting device a plate having a channel in which the coins are adapted to be advanced edgewise, an endless movable coin feeding means having successive spaced abutments projecting into and movable along said channel and adapted to engage against the edges of the respective coins, said channel having a gaging shoulder means adapted to stop the advance of a coin of a predetermined diameter, said abutments being resiliently urged into coin feeding position and automatically retractable to permit continued movement of the conveyor when the corresponding coin is stopped, counter means connected to be operated by the retraction of the abutments, and means for discharging the stopped coins from said channel.

16. In a coin counting device a plate having a channel at its under surface in which the coins are adapted to lie flat to be advanced edgewise, a rotary coin feeding table below said plate having successive spaced pins mounted in openings in said table normally projecting into and movable along said channel and adapted to engage against the edges of the respective coins, said channel having a shoulder adapted to stop the advance in the channel of a coin of a predetermined diameter, said pins being urged by resilient means upwardly into coin feeding position and having surfaces causing the pins to be cammed downwardly when the corresponding coin is stopped permitting the pin to advance with the table under the coin, counter means connected to be operated by the retraction of the pins, and means for discharging the stopped coins from said channel.

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