

Aug. 13, 1968

G. PICOLLO  
COUNTING MACHINE ADJUSTABLE FOR COINS  
OF DIFFERENT DIAMETERS

3,396,737

Filed May 19, 1966

4 Sheets-Sheet 1

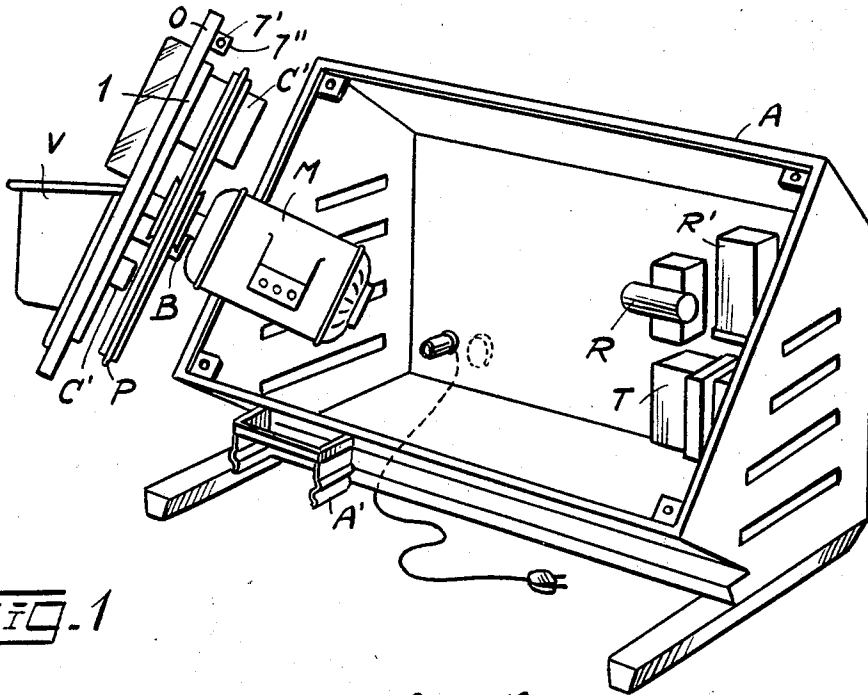


FIG. 1

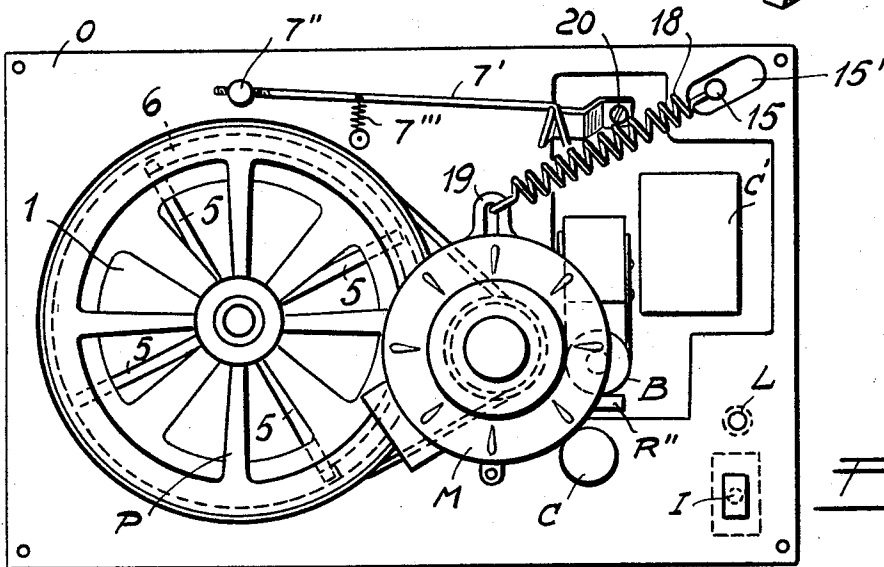


FIG. 3

INVENTOR.  
GIACOMO PICOLLO  
BY *Musler and Torrey*  
Attorneys

Aug. 13, 1968

G. PICOLLO  
COUNTING MACHINE ADJUSTABLE FOR COINS  
OF DIFFERENT DIAMETERS.

3,396,737

Filed May 19, 1966

4 Sheets-Sheet 2

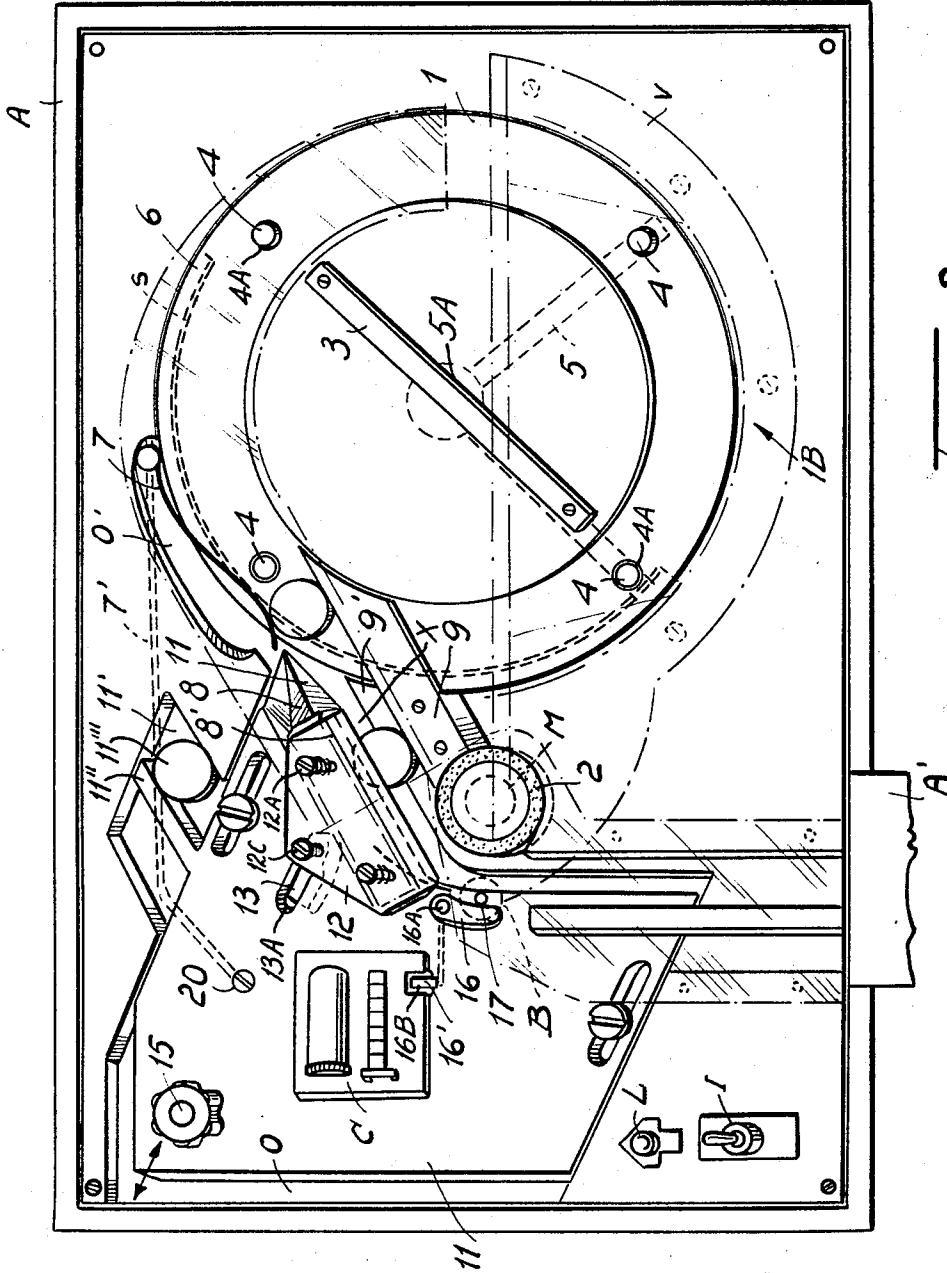


FIG. 2

INVENTOR.  
GIACOMO PICOLLO  
BY *Muller and Toran*  
Attorneys

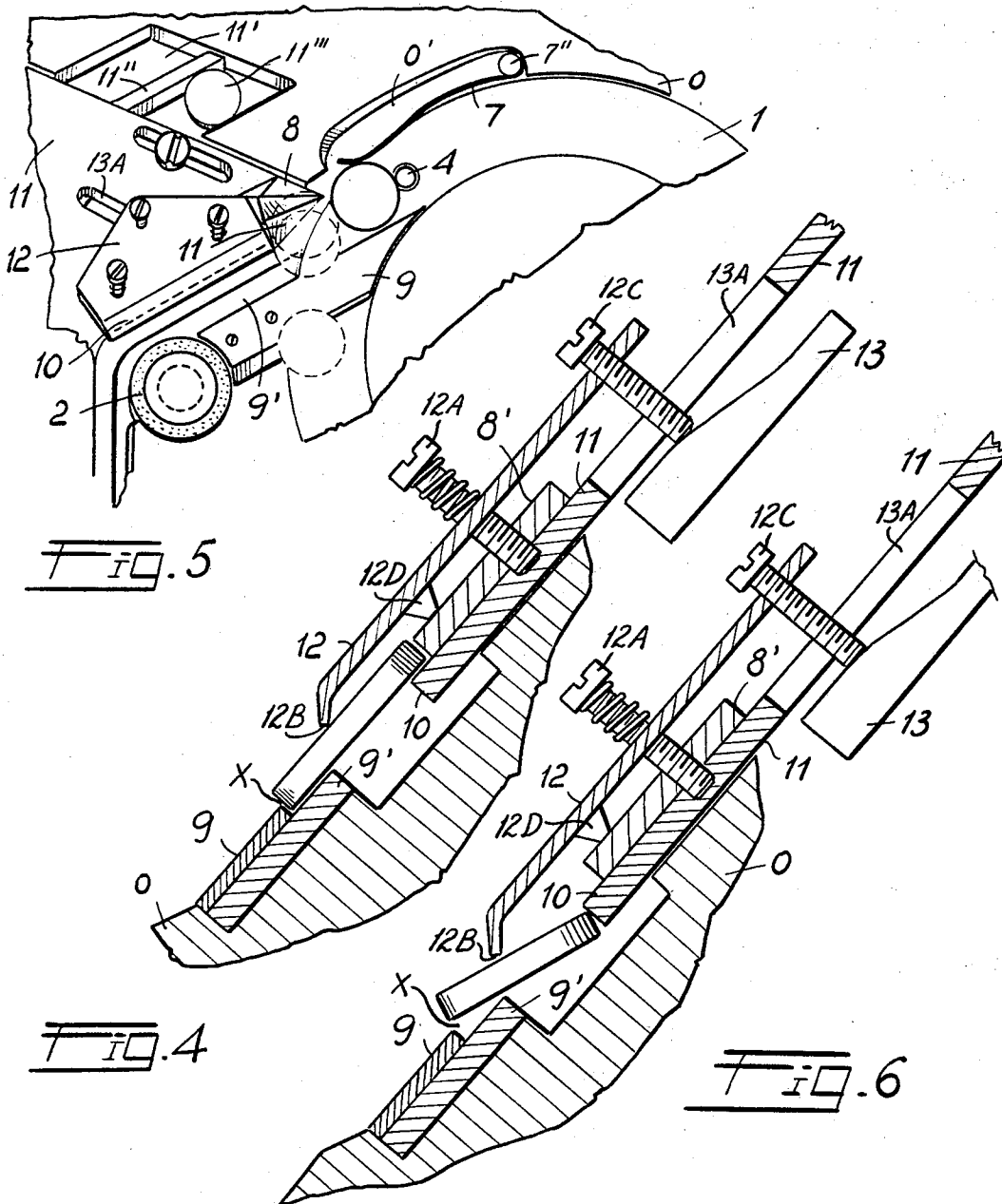
Aug. 13, 1968

G. PICOLLO  
COUNTING MACHINE ADJUSTABLE FOR COINS  
OF DIFFERENT DIAMETERS

3,396,737

Filed May 19, 1966

4 Sheets-Sheet 3



INVENTOR,  
GIACOMO PICOLLO  
BY *Marshall and Torrey*  
Attorneys

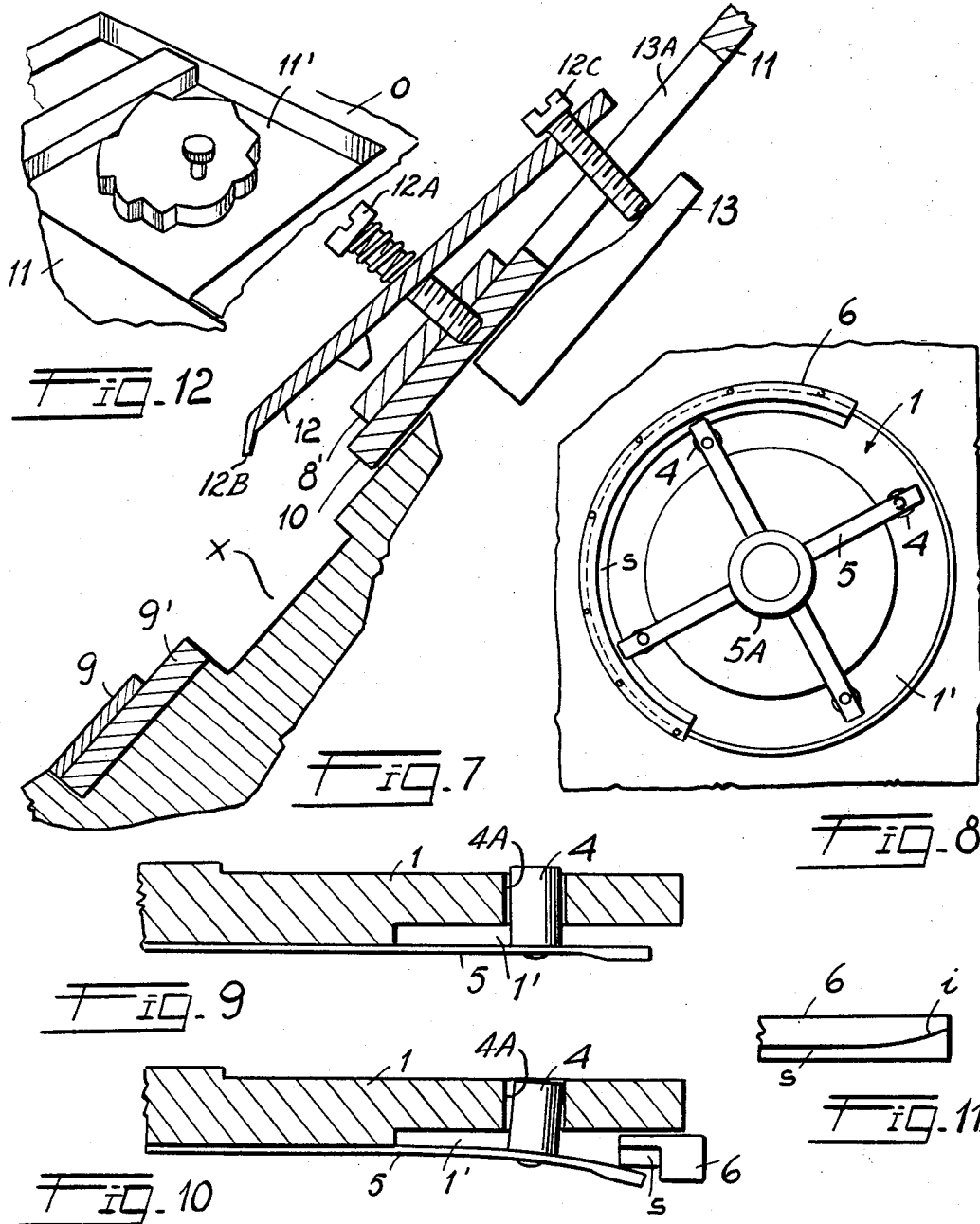
Aug. 13, 1968

G. PICOLLO  
COUNTING MACHINE ADJUSTABLE FOR COINS  
OF DIFFERENT DIAMETERS

3,396,737

Filed May 19, 1966

4 Sheets-Sheet 4



INVENTOR.  
GIACOMO PICOLLO  
BY *Muller and Torrey*  
Attorneys

1

2

3,396,737  
**COUNTING MACHINE ADJUSTABLE FOR COINS  
OF DIFFERENT DIAMETERS**

Giacomo Picollo, Capriata d'Orba,  
Alessandria, Italy

Filed May 19, 1966, Ser. No. 551,382

Claims priority, application Italy, Mar. 17, 1966,

Patent 762,523

14 Claims. (Cl. 133—3)

**ABSTRACT OF THE DISCLOSURE**

A coin counting machine arranged with a coin trackway adjustable to a number of different coin widths. The operating surface of the machine is disposed at an angle to the horizontal and contains a rotatable dish which feeds coins into the trackway. Coins of a greater diameter than the coin size being counted are prevented from entering the trackway while coins of a smaller diameter are displaced from the trackway before completing passage there-through. Additionally, an adjustable plate having an edge aligned above and along the trackway provides means for limiting the thickness of coins permitted to pass through the trackway. Further, means are associated with the dish for directing coins toward the trackway. A wheel is provided in the trackway for driving coins into engagement with a coin counting mechanism and then into a special receptacle.

**SUMMARY OF THE INVENTION**

This invention relates in general to counting machines and in particular to a new and useful machine for automatically selectively counting coins of one denomination.

Electric machines for counting coins are well known. However they have various drawbacks. Firstly, they are not suitable for the selection of various denominations of coins but are able only to count coins of a certain type. Secondly, the machines are all fitted with one horizontally arranged collecting dish and one small roller for aiding in directing the coins going out of the machines one by one. This action produces a sliding friction and therefore a noticeable wearing of the small roller and the underlying plate. In the third place, known machines are equipped with a single revolution indicator which is actuated by the single coins leaving the machine through a multiple tip wheel. Another defect of the known machines is that they are equipped with a complex and heavy device for the machine which is mechanically stopping the operation, and further equipment is disadvantageously, located inside the machine and operates for four or five pre-established amounts coin denominations only. Some machines do have means for the selection of different kinds of coins, but are especially complex, expensive, and slow in operation (400-600 coins per min.).

In accordance with the invention there is provided a simple but rapidly operating coin machine. The machine includes a rotatable dish member which is arranged to receive the coins with means associated therewith for deflecting the coins into a trackway. A feature of the invention is that the trackway is defined by adjustable plate means which include a deflection plate which may be positioned for deflecting away all the coins of a selected denomination. In order to facilitate the easy selection of the coin which is to be counted at any specified time, the means defining the trackway includes an adjustment portion which permits shifting of a deflection plate and a trackway coin sizing plate so that only the coin of the selected denomination will be accommodated within the trackway. A further adjustment may be made for the thickness of the coin by varying the position of an adjustable overlying plate for

the trackway. The coins are initially fed from the rotating wheel tangentially into the entrance of a trackway where they are retained by a spring member which is also adjusted when the means defining the trackway is adjusted.

5 A further feature of the invention is the provision of a driving roller located along the trackway which insures that each coin is fed by rolling contact past a counting member to effect a rapid but accurate counting of the selected denomination coin.

10 Accordingly, an object of the invention is to provide an improved counting machine having means for accurately separating coins of a selected denomination and advancing them past means for counting the selected coins.

15 A further object of the invention is to provide a counting machine having roller means for advancing the coins to insure that the operating parts will not be subjected to high friction and further including improved plate means which may be moved in order to set the machine for the denomination of coin which is to be counted.

20 A further object of the invention is to provide a counting machine which is simple in design, rugged in construction and economical to manufacture.

25 While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

In the drawings:

30 FIG. 1 is a front perspective view of the machine indicating the front cover with the counting mechanism removed from the housing;

FIG. 2 is a front elevational view of the counting mechanism;

FIG. 3 is a rear elevational view thereof;

35 FIG. 4 is an enlarged sectional view of the trackway shown in FIG. 2;

FIG. 5 is a partial front elevational view of the portion of the trackway indicated in FIG. 4;

40 FIG. 6 is a view similar to FIG. 4 but indicating a rejected coin in position;

FIG. 7 is a view similar to FIG. 6 but indicating the adjustment of the coin thickness adjustment plate;

FIG. 8 is a rear elevational view of the coin pin members;

45 FIGS. 9 to 11 are sectional views indicating the operation of the coin pin members; and

FIG. 12 is a top perspective view of another embodiment of means for sizing the machine for a particular coin denomination.

50 A machine constructed in accordance with the present invention provides three substantial improvements in respect of the known machines;

(1) It is a fast operating machine for counting more than 2,000 coins/min. and in addition it is a sorting machine;

55 (2) It is provided with one container with universal stops thus being suitable to count any pre-established number of coins of different denomination (and not only four or five denominations);

60 (3) It permits a change of the coin type to be counted through a single operation compared to the three operations required by the known machines (operations required in order to change the width of the coins outlet, the distance of the base plate vertical small roller for said outlet, and finally the height of channel for directing the coins).

70 The machine of this invention, as shown on the drawing, is provided with one M 950-1000 r.p.m. motor, the r.p.m. being reduced by means of a reduction pulley P down to 80 r.p.m. which are imparted to plate or dish I upon which coins are placed, and which can be rotated by actuating switch I connected electrically to the motor. The electric

system in addition includes two transformers T, two rectifiers R, and a relay R', the three elements located on the bottom of frame A. In addition a reservation coil B, a capacitor C, a counter C' (45-50 pulses/min. sensitive), a warning lamp L (for indicating the number of coins of the denomination have been counted), and a resistance (R'') (in series with coil B) secured on support plate 0. The electric system is not described in detail since it is not novel per se. Referring to the drawings in particular, a first feature of the machine of this invention is the provision of a dish 1, upon which the coins to be counted are placed. The whole counting mechanism including the support plate 0 and the dish 1, are mounted at a 50° inclination to the horizontal. The coins, as selected, will leave the machine under the influence of the force of gravity in addition to the action of a small driving wheel 2 located on the axle of motor M and which pushes the coins downwardly by rolling friction (and not by sliding friction as in known machines).

Coins one by one are driven into a guide and outlet channel or trackway (at the end of which is located the said small wheel 2) due to the action imparted by a small diametrically arranged bar 3 carried on the front of dish 1 and the action of four small pins 4 angularly spaced 90° apart near the periphery of dish 1. The pins 4 are each mounted at the end of a plate or arm 5 located on the rear face of the dish (see FIGS. 2 and 3). The arms 5 are spaced 90° apart and extend from a common hub 5a. Each of the pins 4 register with and extend into a hole 4a through the dish. As the dish 1 and the arms 5 rotate, the pins are deflected from a position projecting a few millimeters through the dish (see FIG. 9) to a position retracted into the hole 4a (see FIG. 10). During rotation, the ends of the arms engage a cam member 6 for approximately 180° of their travel (see FIGS. 2, 3 and 8). The cam member 6 is located below the outer edge of the dish 1 for one-half the periphery of the dish and it contains a cam surface *s* with bevels *i* at each end for guiding the ends of the arms 5 into and out of contact with the cam surface. As the outer end of the arm 5 contacts the same surface *s*, it is deflected away from the back surface of the dish and the pin it carries is retracted into its hole 4a (see FIG. 10). When the end of the arm clears the cam member, the pin 4 again projects upwardly above the surface of the dish 1.

Due to the sloping orientation of the dish 1, it rotates in the direction of the arrow between a high point 1A and a low point 1B (see FIG. 2). Accordingly, for one-half the path of travel of the dish, between a point about 30° before the high point 1A and about 30° before the low point 1B, the pins are retracted into the dish and for the other half of the path, the pins extend above the surface of the dish.

As the coins reach the high point 1A on the periphery of the dish 1, they contact the spring 7 which prevents the coins from moving off the dish and directs them into an adjustable width trackway X. The spring 7 is adjustably positionable along with trackway X to accommodate various coin diameters. At its end remote from the entrance to the trackway X, the spring 7 is secured to the plate 0 by means of a pin 7'' (see FIGS. 2, 3 and 5). On the reverse side of the plate 0, a small rod 7' is secured at one end to the pin 7'' and at its other to the guide-plate 11 to which it is attached by means of a bolt member 20. Intermediate its ends, the rod 7' is secured to the plate 0 by a retaining spring 7''', the manner in which this assembly of parts acts to position the spring will be set forth later.

The outlet channel or trackway X is defined on one side by stationary track plates 9, 9' disposed on plate 0 and on the other side by the movably positionable edge 10 of guide plate 11 and the plate 8' secured to the guide plate. The guide plate 11 is arranged in coplanar relationship with plate 0 and is arranged within an opening formed in plate 0. The guide plate 11 is selectively positionable relative to the plate 0 whereby the edge 10 and plate 8'

can be spaced in parallel relationship with and a specific track width from the plates 9, 9'. The plate 9' and the edge 10 of the guide plate 11 form the bottom surface of the trackway while the stationary plate 9 and the plate 8' form the edges of the trackway X. A recess 11' is formed between the guide plate 11 and the plate 0, with an arm 11'' extending from the guide plate 11 into the recess 11'. By inserting a selected coin 11''' into closely fitting engagement with the arm of the recess on one side and the opposed edge surface of the plate 0 on the other and securing the plate 11 in place, the dimension between the opposed edges of the trackway can be established in a width corresponding to the diameter of the coin 11'''. When the guide plate 11 is fixed in position relative to the plate 0, the spring 7 is also positioned relative to the trackway in relation to the width of the coin to be passed through the trackway. As the plate 11 is moved, the small rod 7', connected to the plate by means of the bolt 20, is moved and pivots the pin 7'' positioned in the plate 0. As the pin 7'' is pivoted, it adjusts the position of the spring 7 which is attached to the pin. Due to the retaining spring 7''', a force is exerted on the rod 7' and, in turn, on the spring 7 for assuring their proper positioning after adjustment of the guide plate 11.

At the entrance, from the dish into the trackway, the stationary plate 9 is positioned above and extends chordally inward of the dish 1. The plate 9 is arranged so that it does not contact the pins in dish 1 or otherwise interfere with its rotation. Further, the plate 9 guides coins into the trackway X from the outer edge of the dish 1.

The coins with a diameter equal to that of the selected coin 11''' are moved along the trackway between the plates 8' and 9 as shown in FIG. 4. The coins entering the trackway X and having a smaller diameter than that of selected coin denomination will not be retained on the trackway and will fall down by gravity (see FIG. 6). The coins with a diameter larger than that of selected coin 11''', finally (see FIG. 5) are ejected by tooth 8 of plate 11 at the entrance to the trackway. Generally the coins of a smaller value have a smaller diameter and a reduced thickness, however, this is not always so. For this reason a small cam 13 (FIGS. 4 and 6) is provided with a profile which increases in height. The cam is slidably positionable below a recess 13A in the guide plate 11. The support structure for the cam is not shown. A plate 12 is spring mounted on the guide plate 11 by a pair of threaded bolts 12A having adjusting springs on the shank of the bolt. The plate 12 has a downwardly inclined edge 12B which is aligned above and along the trackway X. Another bolt 12C threaded through the plate 12 contacts the cam 13 (see FIGS. 4, 6 and 8). The plate 12 has a support pad 12D normally in contact with the surface of the plate 8', and when the plate 12 is in position as shown in FIGS. 4 and 6, the edge 12B limits the thickness of coins admitted to the trackway X. However, the plate 12 can be displaced upwardly by positioning the cam as shown in FIG. 8 so that the bolt 12C contacts the cam on its lower surface and the bolts 12A locate the plate 12 in an upwardly displaced position. The machine can promptly be set according to the thickness of type coin by adjusting said three bolts 12A, 12a, 12c. As shown in FIGURES 2 and 5 the width of the coin handled can be changed by changing the width of the trackway or guide channel. The proper width of the trackway is set by locating plate 11 using a coin as a gage. The coin is set in the recess 11' of guide-plate 1 and the plate 11 is adjusted accordingly. During operation the guide plate 1 is kept stationary by means of stop spring 18 located at the rear of the plate 0 extending between pin 15 and secured to the guide plate on and to the element 19 of the support plate 0. The coins passing downwardly through the trackway X will be directed by the driving wheel into contact with a jack lever 16 positioned opposite the wheel and pivotally mounted on guide plate 11 by means of a pin 16A. A crank arm 16' is secured at one end to

the pin 16A of the jack lever and at the other end to a spring 16B which forms an operating part of the counter C. As a coin is directed by the wheel 2 against the jack lever 16, it causes the lever to rotate or pivot about its pin 16A and, in turn, the crank arm 16' oscillates and transmits an impulse through the spring 16B to the counter C. After the coins actuate the jack lever 16, they drop into a special container V (see FIG. 1) located on the front of the plate 0. After any pre-established amount of coins has been counted, the machine will stop. The warning lamp L will be switched on and a small pin 17 located laterally of the small lever 16 will be moved to block the lever under the control of an electric pulsing of coil B. When the machine stops, dish 1 due to inertia will make another revolution and the coins accumulate over the guide channel and could cause damage to the machine. However, this is prevented by the lowering of the small pins 4 30° before the high point 1A of dish 1 and by the provision of a suitable pocket 0' located on plate 0 to receive the accumulated coins. Instead of employing a coin of the selected denomination for setting the machine (see FIG. 12) a round cam having a plurality of width spacing profiles may be used in the recess 11'. The machine can be easily operated manually in which case the motor and reservation coil are eliminated. Provision is made for an irreversible bearing and one handle for manual operation. While specific embodiments of the invention have been shown and described in detail to illustrate the application of the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

I claim:

1. A coin counting machine comprising an inclined rotatable coin receiving dish member, said dish member rotating in a path of travel between a high point spaced above a low point, means for rotating said dish member, means defining a discharge trackway having an adjustable width for passing coins therethrough, said discharge trackway having an entrance located on the edge of said dish member situated on the downward path of said dish member from its high point to its low point, means for directing coins from said dish member into said discharge trackway, said means defining said trackway comprising a stationary member forming one side of said trackway, and a movable support member forming the other side of said trackway, said stationary member and movable support member having opposing surfaces disposed in spaced parallel relationship to pass a coin of a selected diameter through said trackway, a member located at the entrance of said trackway for displacing coins of a diameter greater than the width of said trackway, coin support means within said trackway arranged to displace from said trackway coins having a diameter less than the selected diameter of the coin arranged to pass through said trackway, a rotatable drive wheel positioned within and spaced from the entrance of said trackway for advancing coins therethrough, and coin counting means having an actuating member disposed within said trackway for counting coins advanced therethrough by said drive wheel.

2. A coin counting machine, as set forth in claim 1, wherein said stationary member comprises a pair of longitudinally extending members disposed along said trackway, one member positioned below the other, the bottom member supporting the coin along one side of said trackway and the top member forming one edge of said trackway, and on the other side of said trackway said adjustably positionable plate supporting the coin along that side and a strip member superposed on and secured to said adjustably positionable plate and forming the opposite edge of said trackway.

3. A coin counting machine, as set forth in claim 1, wherein a locking means is secured to said adjustably positionable plate and to said support plate for maintain-

ing said adjustably positionable plate stationary during the rotation of said dish member.

4. A coin counting machine, as set forth in claim 1, wherein a spring member is positioned at the outer edge of said dish member between its high point and the entrance to said trackway for preventing the coins on said dish from escaping therefrom.

5. A coin counting machine, as set forth in claim 8, wherein an adjustably positionable plate is disposed within the opening in and in substantially coplanar relationship with said support plate, said movable support member of said trackway is secured to said adjustably positionable plate for displacement in parallel relationship with said stationary member of said trackway.

6. A coin counting machine, as set forth in claim 5, wherein a plate member is mounted on said adjustably positionable plate, said plate member having a downwardly directed edge extending longitudinally along and above said trackway, and means for positioning the downwardly directed edge of said plate member relative to said trackway for selectively limiting the thickness of coins passable therethrough.

7. A coin counting machine, as set forth in claim 5, wherein a recess is formed in the opening through said support plate between oppositely arranged parallel surfaces on said support plate and on said adjustably positionable plate, in said recess the parallel surfaces of said adjustably positionable plate being movable relative to the parallel surfaces on said support plate and the opposed parallel surfaces being adapted to receive a coin there between acting as a gauge for establishing the width of said trackway between said stationary and said movable support member secured to said adjustably positionable plate.

8. A coin counting machine, as set forth in claim 1, wherein an inclined support plate having an opening therethrough is arranged to receive said dish member in said opening, said dish member and said support plate disposed in substantially coplanar relationship.

9. A coin counting machine, as set forth in claim 8, wherein said stationary member of said trackway is attached to said support plate and extends chordally inwardly from the edge of said dish member for directing coins on said dish member into said trackway.

10. A coin counting machine, as set forth in claim 1, wherein said coin counting means comprises a coin counter, a pivotally mounted jack lever disposed within said passageway and arranged to be pivotally displaced by a coin passing through said passageway, and an arm connected to said lever and to said coin counter for transmitting to the coin counter the motion imparted to each coin to said jack lever as the coins pass through said trackway and thereby counting the number of coins passing said jack lever.

11. A coin counting machine, as set forth in claim 4, wherein means are secured to said adjustably positionable plate for varying the position of said spring member relative to the spacing of said stationary support member and movable support member forming said trackway for adjustably positioning the spring member in relation to the size of the coin to be passed through said trackway.

12. A coin counting machine, as set forth in claim 10, wherein a container is mounted on said support plate to receive coins after the coins have completed their passageway through said trackway and have contacted said jack lever.

13. A coin counting machine, as set forth in claim 1, wherein said means for directing coins comprises a plurality of angularly spaced pins arranged within holes near the edge of said dish member, and means for displacing said pins between a first position wherein the pins extend above the coin carrying surface of said dish member and a second position wherein the pins are withdrawn downwardly from the coin carrying surface of said dish into the holes formed through said dish member.

7

14. A coin counting machine, as set forth in claim 13, wherein a diametrically arranged bar is secured to the surface of said dish member for directing coins outwardly toward the edge of said dish member.

8

1,877,989	9/1932	Schwartz	-----	133—8
2,656,085	10/1953	Schmied	-----	221—182
2,715,978	8/1955	Sterling	-----	221—182
3,173,431	3/1965	Chichester	-----	133—3

References Cited

5

FOREIGN PATENTS

UNITED STATES PATENTS

1,400 2/1888 Sweden.

396,297 1/1889 Schofield ----- 221—242

WALTER SOBIN, *Primary Examiner.*