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5 Sheets-Sheet 1

A. C. O. Bock
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Nov. 14, 1933.

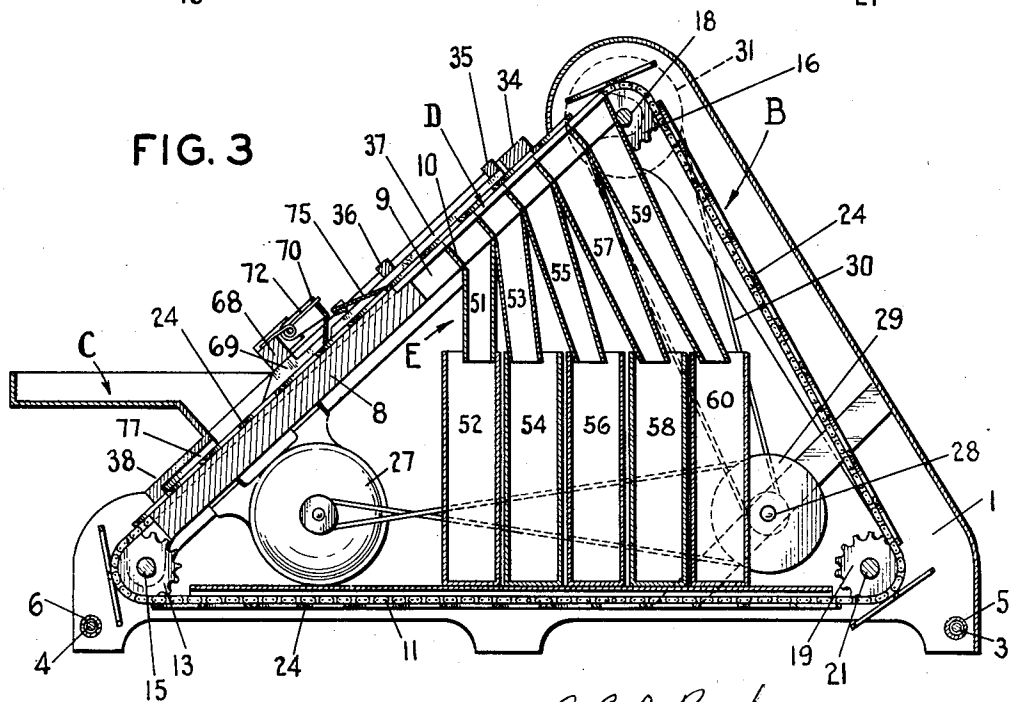
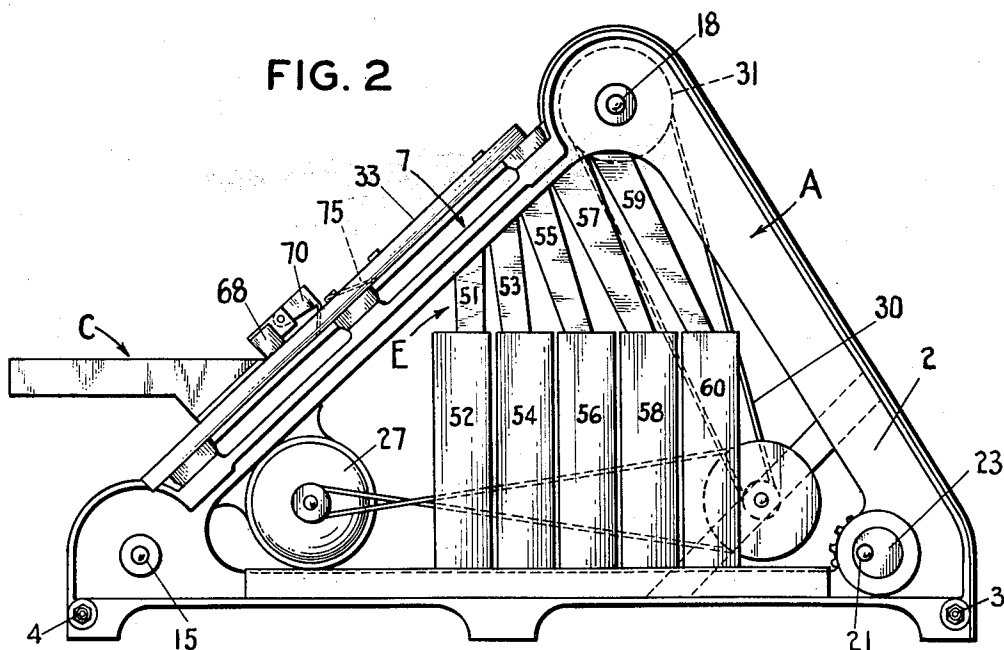
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COIN ASSORTING APPARATUS

Filed Jan. 13, 1931

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FIG 4

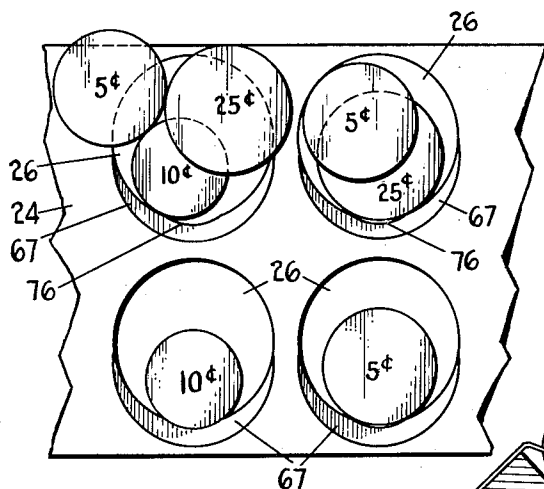
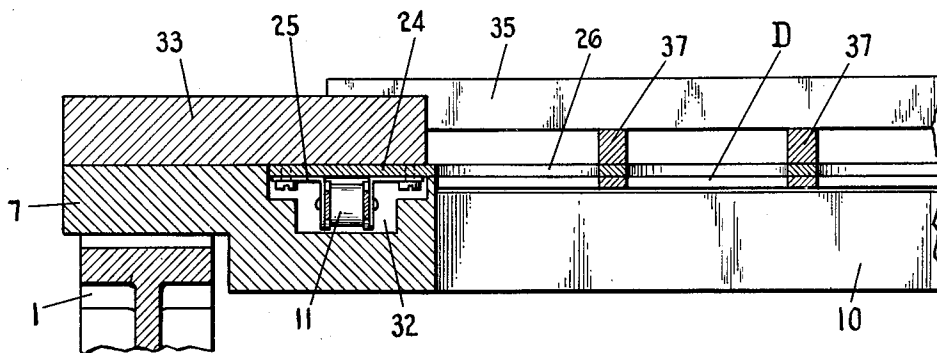


FIG.6

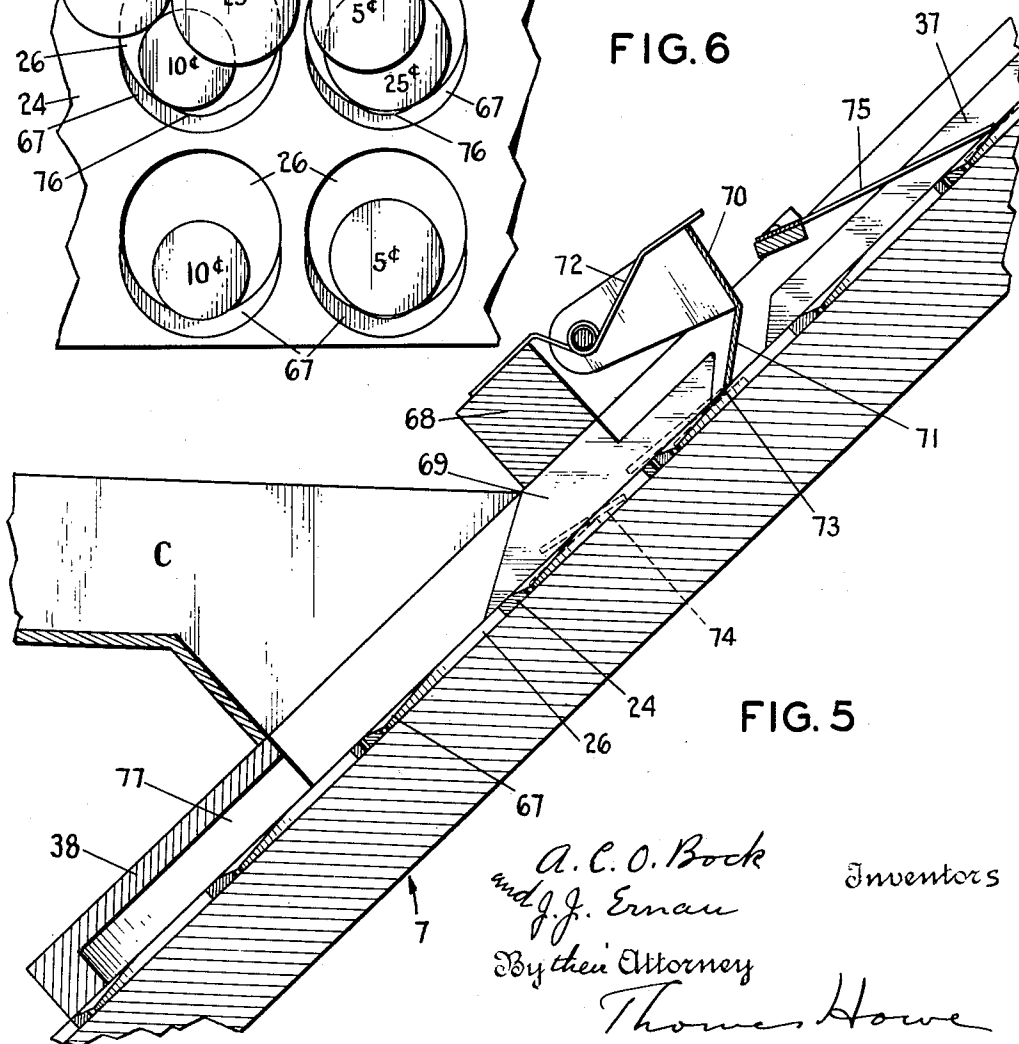


FIG.5

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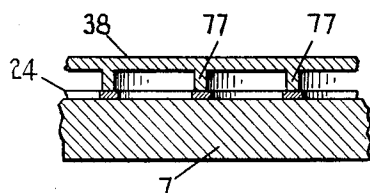
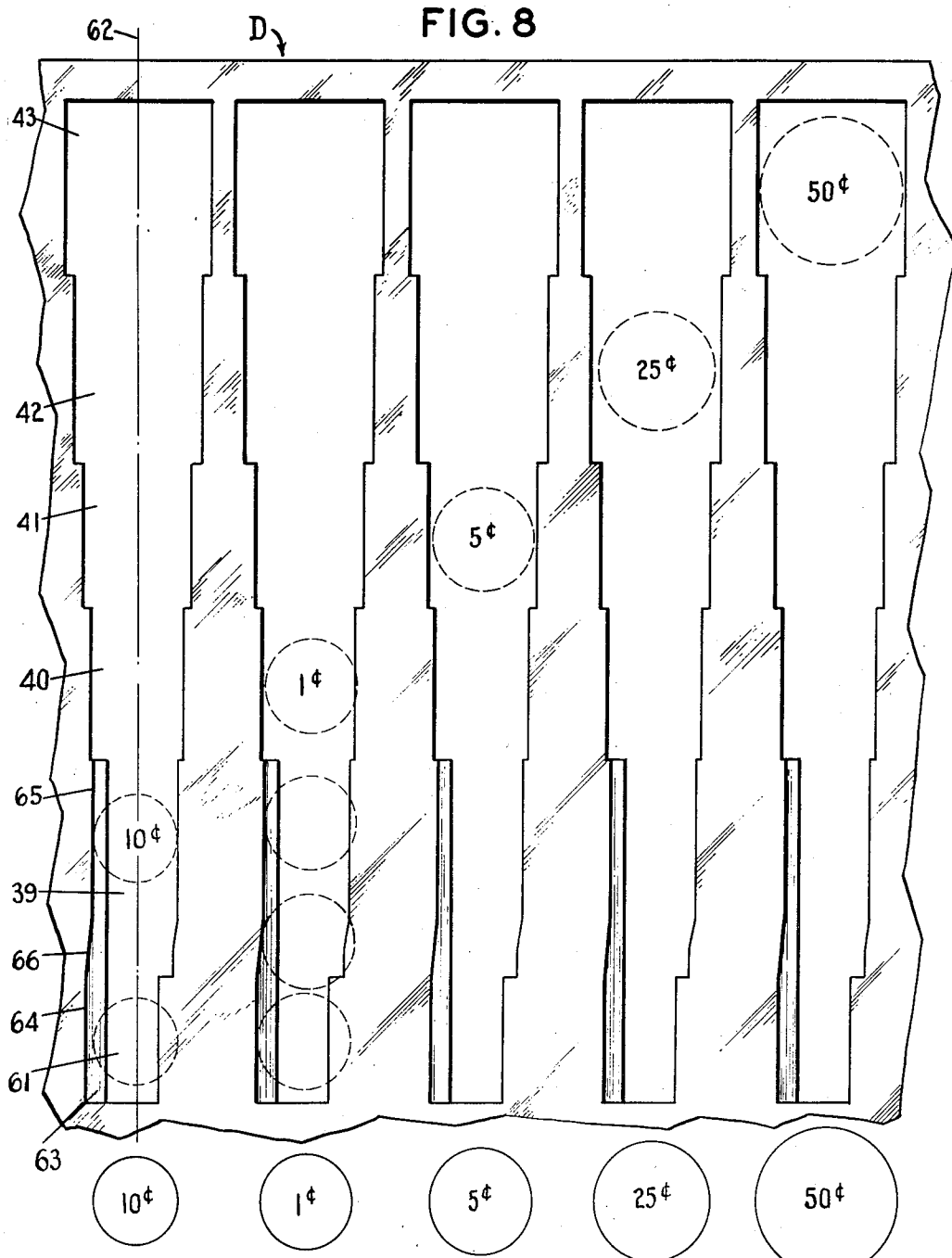
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UNITED STATES PATENT OFFICE

1,934,839

COIN ASSORTING APPARATUS

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Application January 13, 1931. Serial No. 508,410

4 Claims. (Cl. 133—3)

This invention relates to machines for assorting disks such as coins and other like tokens.

It is essential in such machines that they should be accurate and that they should operate with speed.

It is therefore the main object of the invention to provide improved apparatus whereby the accuracy and speed of assorting coins and the like may be increased.

The machine of the present invention operates by moving the disks or coins over appropriate slots of varying sizes and it is important that the coins be properly presented to such slots. It is therefore a further object of the invention to provide means for insuring that the coins bear an appropriate relation to said slots.

It is a further object of the invention to provide a machine of the character indicated with an endless coin carrier whereby the continuous operation of the machine may be accomplished for indefinite periods.

It is a further object of the invention to provide means for unerringly differentiating coins which do not differ greatly in size (such as the dime and cent) so that there will be no chance of a coin falling through the wrong assorting slot and so erroneously mixing coins of different characters.

Other and ancillary objects of the invention will appear hereinafter.

In the accompanying drawings which illustrate the invention;

Fig. 1 is a top plan view of a machine embodying the invention;

Fig. 2 is a side elevation of the machine of Fig. 1;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged section partly broken away, on the line 4—4 of Fig. 1;

Fig. 5 is an enlarged portion of the section of Fig. 3;

Fig. 6 is a face view on an enlarged scale (partly broken away) of a carrier plate showing a possible location of coins thereon;

Fig. 7 is a face view, partly broken away, and on the same scale of Fig. 6, of the carrier and assorting plate;

Fig. 8 is a face view, partly broken away, and on the same scale as Fig. 7, of the assorting plate; and

Fig. 9 is a section on the line 9—9 of Fig. 1 on an enlarged scale.

Referring to the drawings, the apparatus comprises generally a frame A upon which is mounted an endless coin carrier B to which coins are fed

from the table C and which moves the coin over a slotted assorting plate D, the coins being assorted by selectively passing through appropriate slots and the coins from their respective slots being adapted to be received by their respective compartments E, whence they may be transferred to bags or other containers, delivered to counting mechanism or other desired disposition be made of them.

The frame A is triangular in elevation (see Figs. 2 and 3) and comprises the side portions 1 and 2 secured together by bolts 3 and 4 and spaced apart by the sleeves 5 and 6. Also secured to and extending between the sides 1 and 2 of the frame is an inclined assorting plate 7 comprising an imperforate portion 8 and the upper slotted portion 9, the slots being of appropriate size and construction to sort the coins as will be hereafter more particularly referred to. Secured to such manner as to bear against the under side of the slotted portion 9 of the plate, are the cross bars 10 which serve to separate the assorted coins which have come through the plate and also support the plate which is usually thinner at the slotted portions. Bearing against the assorting plate 7 comprising the imperforate portion 8 and the slotted portion 9, is the endless coin carrier comprising a series of plates 24 secured to endless sprocket chains 11 and 12 passing over sprocket wheels 13 and 14 on the shaft 15 rotatably mounted in the frame sides 1 and 2, the sprocket wheels 16 and 17 on the shaft 18 rotatably mounted in the frame sides, and the sprocket wheels 19 and 20 on the shaft 21 rotatably mounted in cams 22 and 23 in the frame sides, these cams, by rotation in their bearings in the frame sides, providing means for shifting the shaft 21 so as to permit the removal or placement of the sprocket chains on the sprocket wheels and for regulating the tension of the chains. Each of the plates 24 is secured at its ends to the sprocket chains by rivets, screws or other suitable means 25. Each plate is secured to a chain at but a single restricted point intermediate of the sides of the plates so that the plate and chain may separate except at the point of fastening and the chains may readily assume a curved form in passing around the sprocket wheels (see Fig. 3). In each of the plates is a plurality of circular holes 26 to receive the coins to be assorted. When the chains and plates are moving in a straight line, the plates form a substantially continuous plane surface with the holes 26 arranged in a plurality of longitudinal rows and also in a plurality of transverse rows. The sprocket chains are driven by

an electric motor 27 belted to a pulley fixed upon the counter shaft 28 which also has fixed upon it the pulley 29 connected by a belt 30 in driving relation to a pulley 31 fixed upon the shaft 18 upon which the sprocket wheels 16 and 17 are also fixed. The sprocket wheels are driven in such direction by the motor that the plates 24 move upwardly over the plate 7.

The carrier plates 24 are held firmly against the plate 7 by means of a cover plate secured to the assorting plate 7, said cover plate comprising the side portions 33, the transverse bars 34, 35 and 36 supporting and strengthening the longitudinal bars 37 which bear upon the plates 24 between the longitudinal rows of holes 26 and holds the plate 24 firmly against the plate 7 so that there is no chance of a coin becoming wedged between a plate 24 and the plate 7. The transverse bars referred to are arranged with relation to the plates 24 to give sufficient clearance for the passage of the plates and the coins carried thereby.

In each of the sides of the assorting plate 7 is cut a longitudinal channel 32 adapted to receive one of the sprocket chains (see Fig. 4). The side 33 of the cover plate bears against the plates 24 and serves in conjunction with the plate 7 to retain and guide the plates 24 and the sprocket chains. Mounted upon the cover plate is the coin table C adapted to receive the coins which are fed therefrom to the coin carried plates. In order to conserve the floor space of the apparatus and at the same time to avoid of substantially the whole length of the carrier, the table C is mounted some distance from the bottom of the carrier and an apron or hood 38 extends rearwardly from the coin table to a point adjacent the lower end of the coin carrier and making a sufficiently close fit therewith so that coins cannot pass between the carrier plates and the hood. It will be seen that when coins are fed on to the carrier from the table they will, unless caught in the holes 26, have a tendency to slide down the carrier until arrested by the apron 38, to be eventually caught in the successive holes in the carrier plates and carried upwardly across the imperforate portion of the assorting plate 7 to the sorting slots through which the coins will appropriately drop and be guided into their respective compartments.

Within the apron 38 are partitions 77 bearing upon, or in close proximity to, the plates 24 of the carrier. These partitions are respectively located between the longitudinal rows of holes 26 and serve to form pockets or chambers over the respective rows of holes. The coins fed from the table C to the carrier thus enter within the said pockets (unless previously caught and moved upwardly in the hole 26) and so are guided into position over the longitudinal rows of holes 26. The rear walls 78 of the pockets (see Fig. 1) are shown as curved which aids in centering the coins over the longitudinal rows of carrier holes.

It will be seen that there is a row of slots in the assorting plate for each longitudinal row of holes 26 in the carrier, such slots being of appropriate width to permit the passage respectively of appropriate coins, the assorting slot of least width being the first encountered by a coin and the slots progressively increasing in width moving in the direction of the carrier. Thus, the particular machine illustrated being adapted for sorting the usual United States coins, namely dimes, cents, five cent pieces, twenty-five cent pieces and fifty cent pieces, the first assorting slot, as 39, of each row of assorting slots is of a width to pass the smallest

coin contemplated (a dime), but not the larger coins, the next assorting slot, as 40, is of a width to pass the next smallest coin (a cent) but to prevent passage of larger coins, the next slot, as 41, is of a width to permit the passage of the next smallest coin (five cent piece) but retain larger coins, the next slot as 42 is of a width to pass the next smallest coin (25 cent piece) but not the larger coin and the next slot as 43 is of a width to pass a 50 cent piece. The dimes passing through the assorting slots 39, pass into the chute 51 which guides them into the receptacle 52; similarly the cents passing through the slots 40 are guided by the chutes 53 into the receptacle 54, the five cent piece from the slots 41 pass through the chute 55 to the receptacle 56, the twenty-five cent pieces from the slots 42 pass through the chute 57 to the receptacle 58 and the fifty cent pieces from the slots 43 pass through the chute 59 to the receptacle 60. Preceding each row of assorting slots is a slot, as 61, too narrow to permit the passage of any of the coins. This slot is off-centre with relation to the centre line 62 of its row of assorting slots and the longitudinal row of holes 26 in the carrier. This slot 61 has its centre line displaced to the left (Figs. 7 and 8) of the centre line 62 and at its left side is a rabbet 63, the left hand wall 64 of the rabbet being at a distance from the centre line 62 approximately equal to half the diameter of a cent. The rabbet 63 extends along the left side of the dime slot 39, the left wall 65 of the rabbet along the slot 39 being at a distance from the centre line 62 equal to approximately the one-half diameter of a dime, the walls 64 and 65 being connected by an off set 66. By this arrangement the dimes and cents with their centres on the centre lines 62 pass over the slot 61, their left-hand edges dropping into the rabbet 63. The coins are thus carried over the slot 61 to the dime slot 39 where the left-hand side of the coin is supported by the bottom of the rabbet 63, but, the right-hand edge of the dime being unsupported, it will fall down into the slot 39 and the whole coin will pass through the slot. In the case of the cent, however, this coin will be cammed by the off set 66 against the force of gravity so that its centre will be to the right of the centre line 62 and raised or advanced beyond the position which it would occupy when allowed to freely seek its position in contact with the lowermost edge of the carrier hole 26 in which it is located. The cent in passing over the dime slot 39 is therefore constantly held against the rabbet wall 65 by gravity which constantly tends to return to its lowermost position (see Fig. 7) in its carrier hole 26. The wall 65 therefore accurately positions the cent with relation to the dime slot 39 so that it is supported on both sides and cannot fall through. This provision is made desirable by reason of the small difference in diameter between a cent and a dime so that a slight displacement of the cent might result in its accidental falling through the dime slot. By the arrangements provided, the cent is accurately held in position with relation to the slot so that it is surely supported at opposite sides of the slot and accidents of the character referred to are prevented. On reaching the cent slot 40, the cent drops through and passes to its compartment. The five cent pieces pass over the preceding narrower slots until their passage slot 41 is reached when they pass through to their compartment and the twenty-five cent and fifty cent pieces respectively pass over the narrower preceding slots to their respective passage slots 42 and 43 when they pass

through and are conveyed to their respective compartments.

In order that the carrier plates 24 may be sufficiently thick so as to firmly maintain their positions and still the rear walls of the holes may not be high enough to engage more than one coin at a time to positively drive them forward, the upper rear edge of each hole 26 is beveled as at 67 so that the rear wall of the hole 26 perpendicular to the face of the plate and therefore adapted to abruptly abut with the rear edge of a coin to positively move it, is not higher than the thickness of the thinnest coin, usually the dime.

To properly locate the coins in the holes 26, a bar 68 is secured at its ends to the side portions 33 of the cover plate so that it extends across the coin carrier and is separated therefrom so that the coins can pass thereunder, and secured to the bar are partitions 69, one between each longitudinal row of holes 26 in the carrier plates. These partitions extend into close proximity to the carrier plates and are respectively in line with the longitudinal bars 37 of the cover plate and serve to direct coins fed onto the carrier from the table C into the channels formed by the partitions and the bars 37. Entirely across each of these channels extends the rearwardly inclined edge 70 of a scraper 71 which is pivoted to the bar 68 and is pressed downwardly by a spring 72 so that the edge of the scraper is resiliently pressed against the surface of the carrier plates. This scraper will prevent the passage of all coins which have a forward edge above the surface of a carrier plate (as at 73 Fig. 5) so that practically all coins more than one in a hole 26, and all coins not in holes, will be prevented from passage. It is possible, however, that two coins might be in one hole with the forward edge of the overlying coin below the surface of the plate, as for instance at 74 Fig. 5. The upper and superfluous coin will then present an inclined surface to the edge of the scraper which may ride over it. To prevent such superfluous coins from passing on to the assorting slots, a bar secured at its ends to the sides of the cover plate and extending entirely across the carrier but spaced therefrom carries a series of brushes. Each brush 75 extends entirely across a channel between two bars 37 and is formed from a sheet of spring steel slit longitudinally so as to form resilient tongues which bear upon the carrier plates and down into the holes 26. These brushes brush back all superfluous coins (more than one to a hole) which may happen to reach them, and also serve to brush the coin remaining in a hole to the lower side of the hole where it will be properly centered for presentation to the assorting slots if, for any reason, the coin is not so located in the hole.

It will now be seen that, the motor being started and the carrier driven to move upwardly over the assorting plate, coins distributed to the carrier will be properly located in holes in the carrier for presentation to the assorting slots and will be properly assorted by the slots and deposited in their respective containers, and that the opera-

tion may be continuously carried on for indefinite periods by reason of the fact that the coin carrier is endless. It will also appear that an operative machine may have but one hole in the carrier and a single row of assorting slots cooperating therewith but the speed and efficiency of the machine is increased by having a plurality of holes longitudinally of the carrier and a plurality of longitudinal rows of holes with a corresponding plurality of rows of assorting slots.

Each of the disk receiving holes 26 has a recess 76 in its rear wall, the wall of such recess being of a less radius of curvature than that of the other wall of the hole so that the sides of the recess have a steeper slope than the circular walls of the hole would have, thus serving to facilitate and maintain the centering of the coins, particularly the smaller coins such as cents and dimes.

While the invention has been illustrated in what is considered its best application it may have other embodiments without departing from its spirit and is not therefore limited to the structures shown in the drawings.

What we claim is:

1. In a machine of the character described, the combination with an assorting plate having assorting slots, of a disk carrier having a hole for receiving disks and means on said plate and extending along a portion of one side of an assorting slot for laterally guiding a disk into desired position with relation to the last mentioned slot.

2. In a machine of the character described, the combination with an assorting plate having assorting slots, of a disk carrier having a hole for receiving disks and a groove in said plate extending along a portion of one side of an assorting slot for laterally guiding a disk into desired position with relation to the last mentioned slot.

3. In a machine of the character described, the combination with an assorting plate having assorting slots, of a disk carrier having a hole for receiving disks and tending to move a disk in a path where the center of the disk coincides with the longitudinal center line of the hole, and offset means in said slots preceding the slot for the smallest disk for laterally diverting the disk so that its center is at one side of said center line.

4. In a machine of the character described, the combination with an assorting plate having assorting slots, of a disk carrier moving over said plate and having a hole adapted to receive the disk, of a rabbet in said plate and alongside the slot preceding the slot for the smallest disk adapted to receive the edge of a disk as it is moved forward by the carrier, a second rabbet extending along an assorting slot for the smallest disk and laterally displaced from the line of the first mentioned rabbet, said rabbets being connected by an offset whereby the disk is laterally deflected into the said second rabbet as the disk is advanced by the carrier.

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