J. E. DOLDT.

MACHINE FOR OPERATING UPON COINS.

APPLICATION FILED DEC. 31, 1918.

1,433,943.

Patented Oct. 31, 1922

5 SHEETS—SHEET 1.

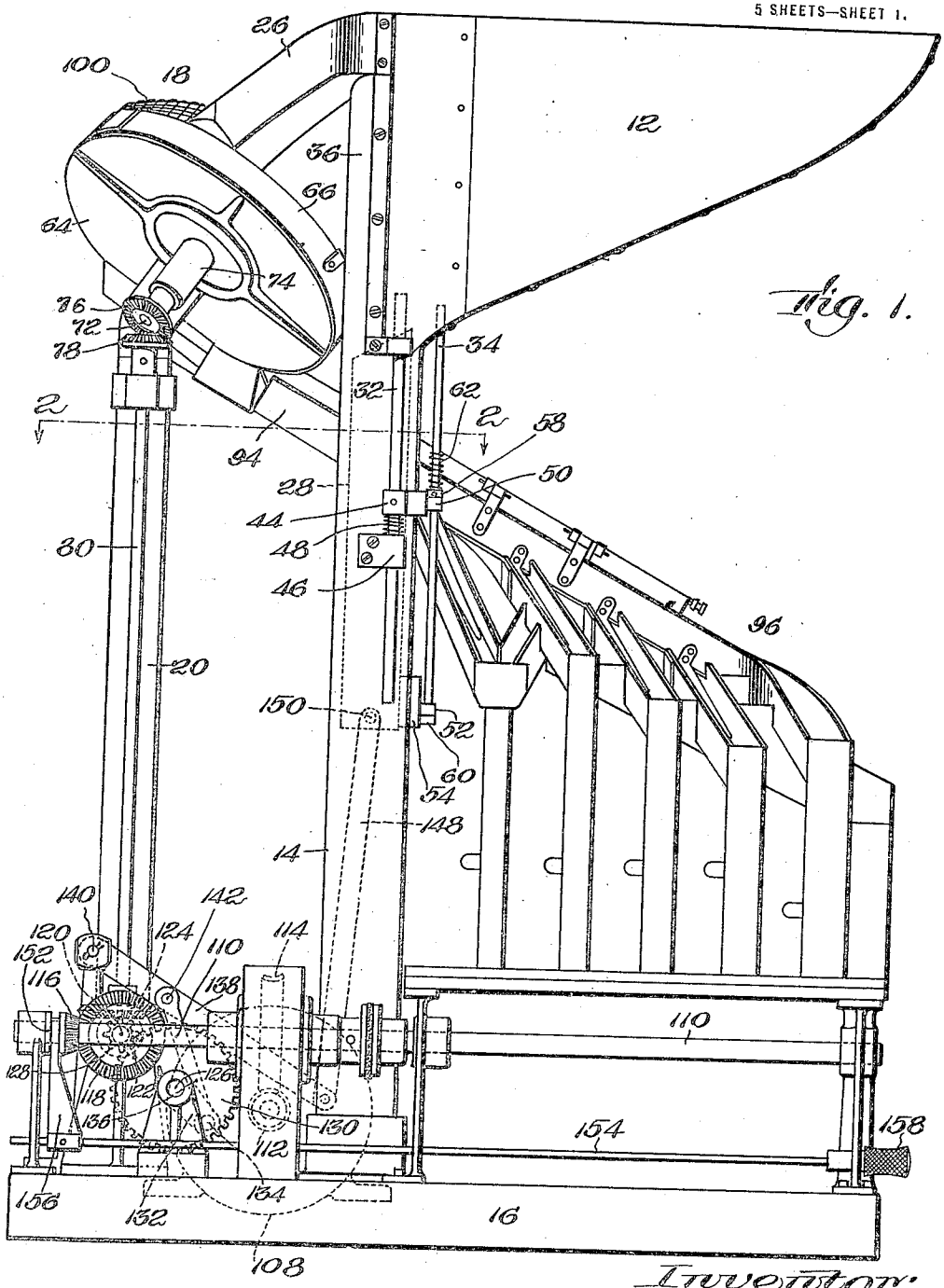


Fig. 1.

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5 SHEETS—SHEET 2.

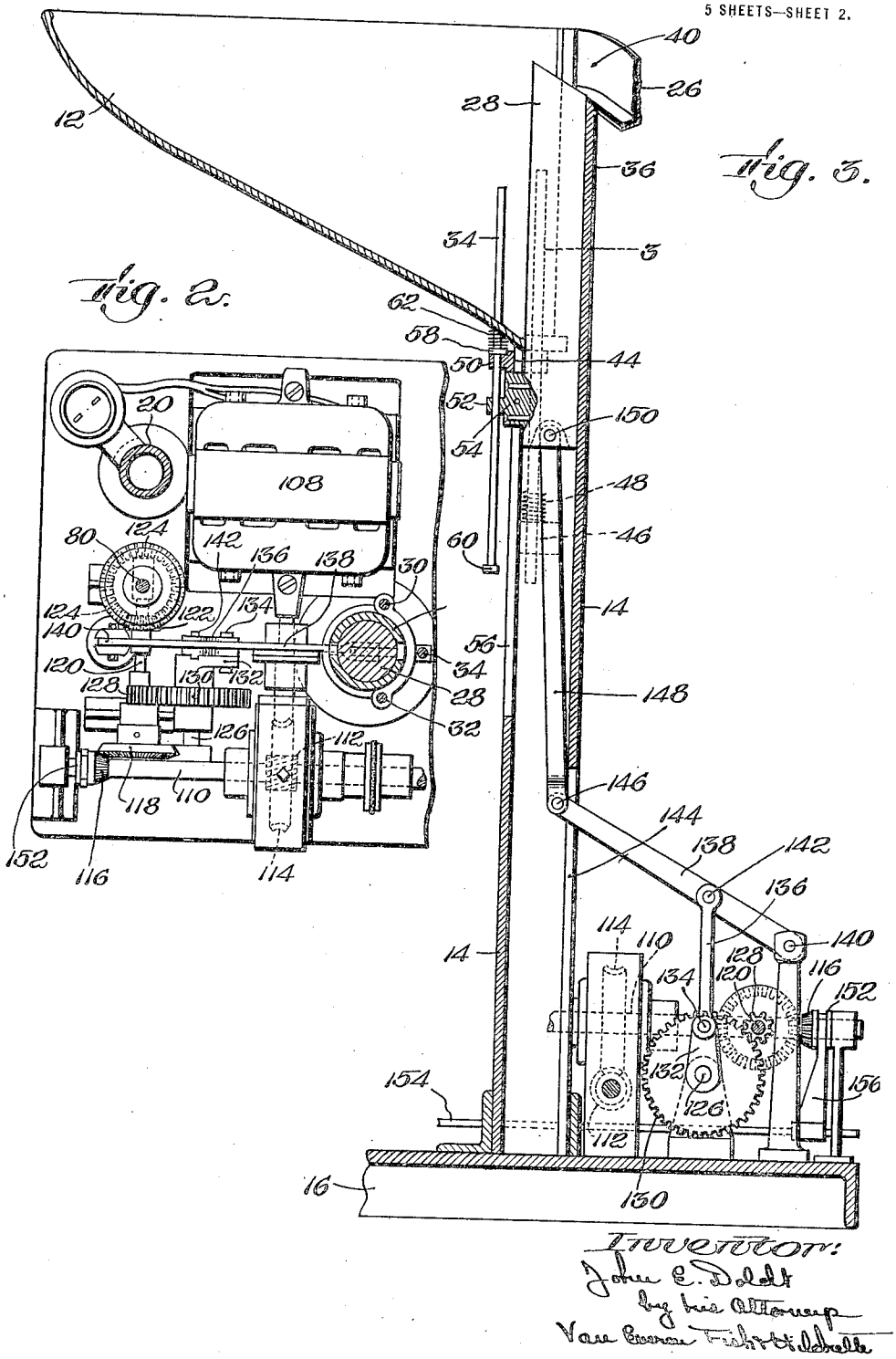


fig. 3.

fig. 2.

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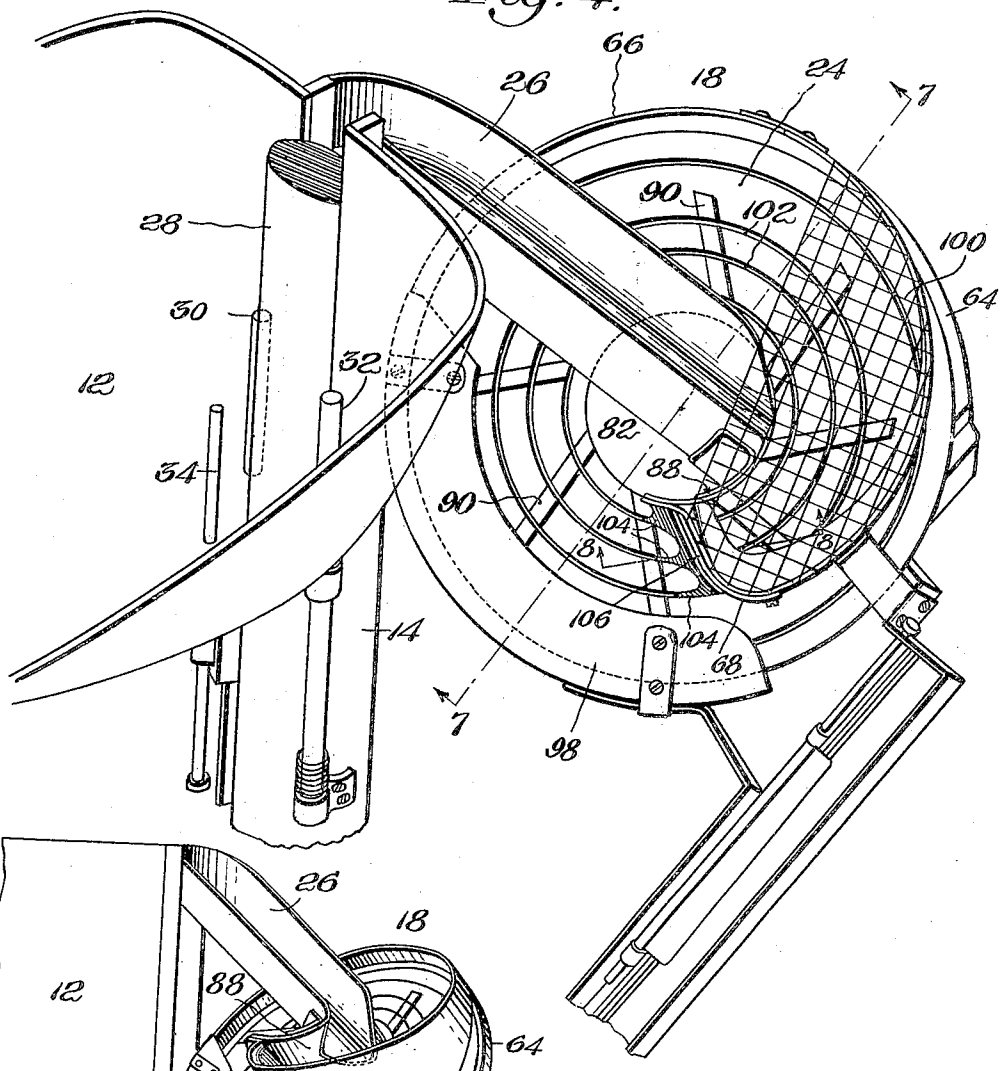
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5 SHEETS—SHEET 3.

Fig. 4.



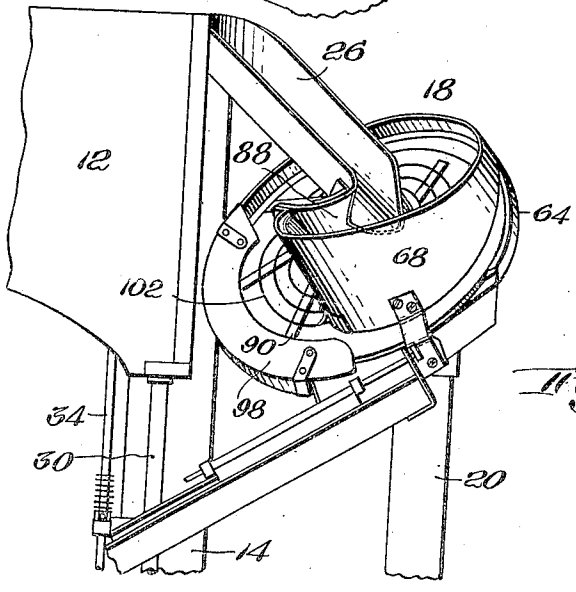


Fig. 5.

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5 SHEETS—SHEET 4.

Fig. 6.

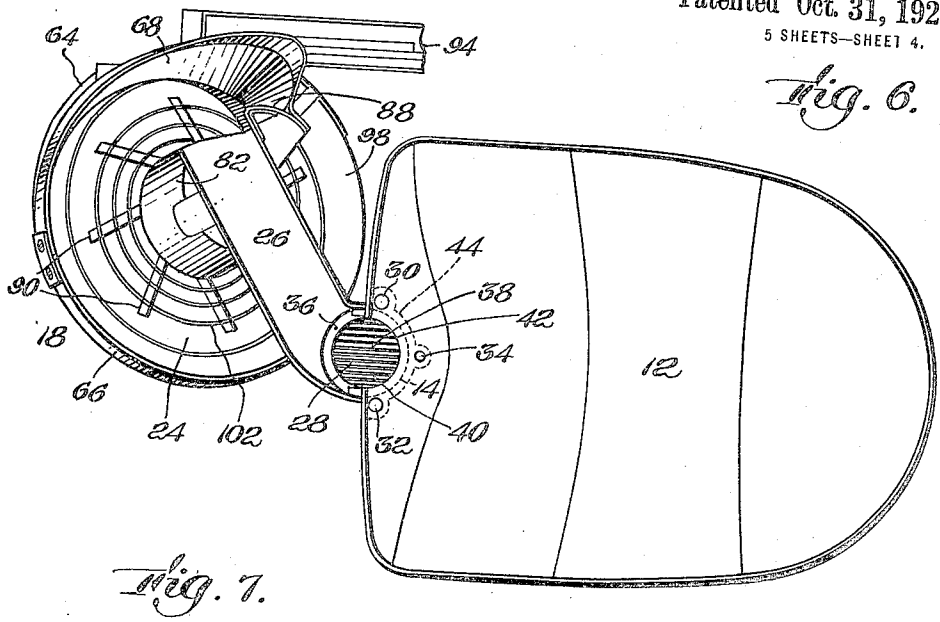


Fig. 7.

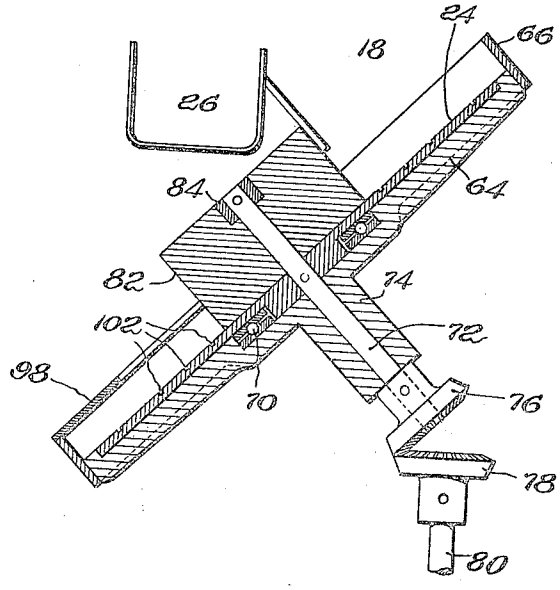
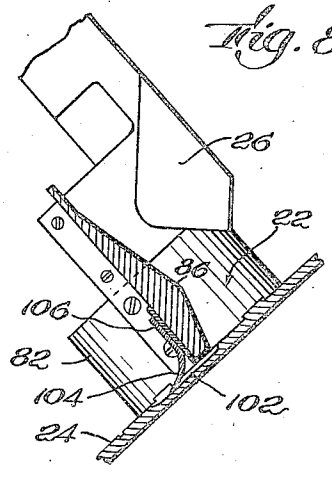


Fig. 8.



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5 SHEETS—SHEET 5.

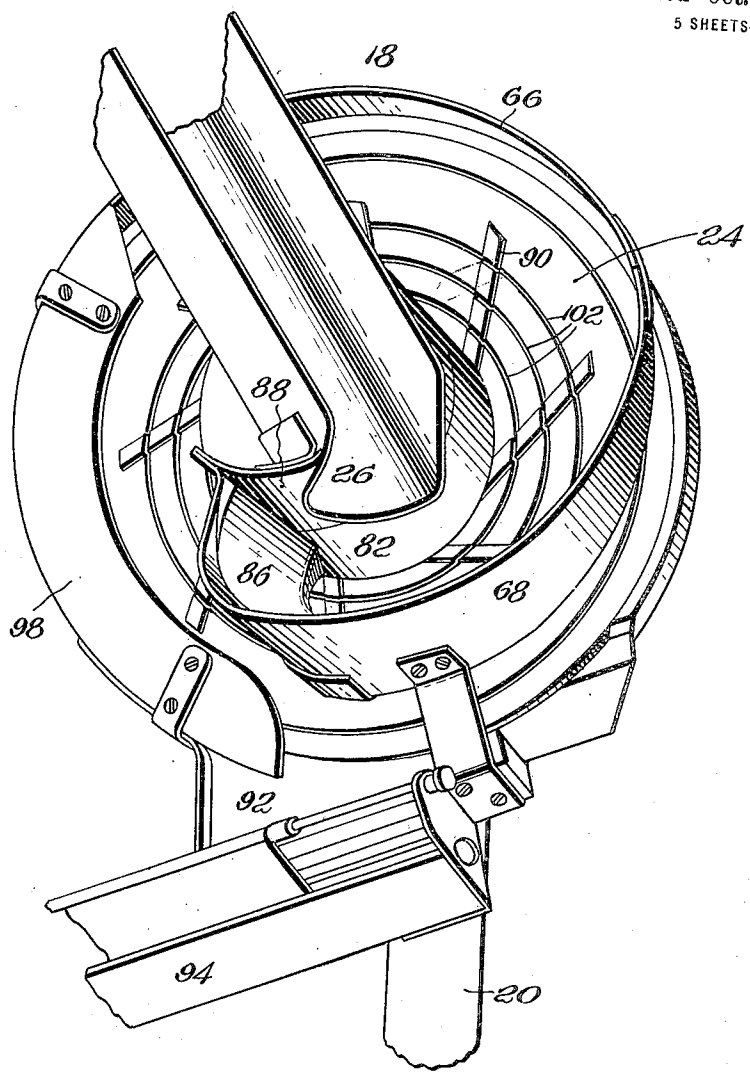


Fig. 9.

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Patented Oct. 31, 1922. 1,433,943

UNITED STATES PATENT OFFICE.

JOHN E. DOLDT, OF PORTLAND, MAINE, ASSIGNOR TO COIN SORTING AND COUNTING COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

MACHINE FOR OPERATING UPON COINS.

Application filed December 31, 1918. Serial No. 269,145.

To all whom it may concern:

Be it known that I, JOHN E. DOLDT, a citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Machines for Operating upon Coins; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines for operating upon coins, or other articles of disk form, to separate them from a mass and deliver them from the machine in succession.

The present invention is especially useful for separating coins of different denominations from an indiscriminate mass and delivering them individually to devices wherein they are subjected to further operations such as sorting and counting.

One object of the invention is to provide certain new and useful improvements in the construction and mode of operation of machines of the above character for the purpose of expediting the separation of the coins and effecting their delivery flatwise in an orderly and substantially continuous procession.

Another object of the invention is to effect the separation of individual coins, or other articles, from a mass, by successive stages, each of which consists of reducing the size of the mass operated upon by separating therefrom a smaller portion.

A further object of the invention is to provide improved means for feeding the coins rapidly from a receiving hopper to a separating device and for insuring against the liability of the coins becoming massed together in the hopper in such a manner as to interfere with the delivery of the coins therefrom.

With these objects in view, one feature of the invention consists in the provision of a hopper for receiving the mass of coins, a coin separating device, and means for successively transferring limited quantities of the coins from the mass in the hopper to the separating device.

Another feature of the invention resides in the rotary distributing plate or disk and the cooperating elements which comprise the separating device and which effect the separation and individual delivery of the coins.

Still another feature of the invention comprises the agitating device which serves to prevent blockading or clogging of the coins in the hopper and to insure the trasfer of a substantially equal quantity of coins from the hopper to the separating device at each operation of the transferring means.

To the accomplishment of these and such other objects as may hereinafter appear, the invention resides in the devices, combinations and arrangements of parts hereinafter described and subsequently defined in the appended claims and which possess advantages apparent to those skilled in the art.

The various features of the invention will be readily understood from the following description and the accompanying drawings illustrating the preferred embodiment of the invention, in which—

Figure 1 is a view in front elevation of the machine showing also a sorting device to which the coins may be delivered; Fig. 2 is a top plan view, partly in section on line 2—2 of Fig. 1 showing particularly the driving mechanism; Fig. 3 is a view in vertical longitudinal section of the hopper and its supporting column showing the agitating device and the transferring mechanism; Fig. 4 is a detail view looking at the top of the separating device and showing also a portion of the hopper; Fig. 5 is a view in rear elevation, partly broken away, of the parts shown in Fig. 4; Fig. 6 is a top plan view of the hopper and the separating device; Fig. 7 is a detail showing a section on line 7—7 of Fig. 4; Fig. 8 is a detail showing a section on line 8—8 of Fig. 4; and Fig. 9 is a perspective view of the coin separating device.

In the preferred embodiment of the invention illustrated in the drawings, the machine comprises, in general, a hopper 12, in which the mass of coins is deposited and which is supported by a hollow column 14, rising from a base 16; a coin separating device 18, which is supported by a post 20, projecting upwardly from the base 16, and is provided with a pocket or receptacle 22 into which the coins are delivered from the hopper, and an inclined rotary distributing or separating plate 24 which forms one side of the pocket 22 and which operates to separate the coins from the mass in the coin pocket and to cause them to be delivered successively from the device; a coin chute

26 for conveying the coins from the hopper 12 to the coin pocket 22; a plunger 28, within the hollow column 14, which is adapted to move upwardly through the hopper to raise a limited number of coins above the mass in the hopper and discharge them into the chute 26; means including the vertical rods 30, 32 and 34 which project through the walls of the hopper adjacent the plunger 28 and are actuated by the movements of the plunger to agitate the coins in the hopper; and means for operating the plunger and for rotating the distributing plate.

In the present machine, thus briefly described, substantially the same number of coins are delivered into the coin chute 26 and guided thereby to the separating device at each operation of the plunger. This intermittent transfer of coins from the hopper to the separating device occurs with sufficient frequency to maintain the proper quantity in the coin pocket 22. A great deal of difficulty has heretofore been experienced in controlling the feeding of coins or similar articles from a hopper, in which a large quantity is contained; a satisfactory and uniform delivery being seriously interfered with by the tendency of the coins to mass themselves together in such a way as to check the flow. The herein described mode of feeding the coins from the hopper has proved to be an exceedingly effective way of overcoming the tendency of the coins to become blockaded and for insuring the feeding of the coins at a substantially uniform rate irrespective of the quantity in the hopper. The coin pocket of the separating device is, in effect, a secondary hopper which is kept replenished from the main hopper so that just the proper working quantity of coins is maintained in the mass in the pocket from which the coins are seperated by the distributing plate. In the main hopper the clogging or blockading of the coins is prevented by the action of the agitating device, while in the coin pocket of the separating device the tendency of the coins to become blockaded is minimized because of the lesser number of coins confined therein and further by the construction and arrangement of the stationary retaining wall of the pocket and by the operation of the rotary distributing plate, all of which will be hereinafter described.

The hopper 12 which is supported by the column 14 is substantially funnel-shaped, being formed by walls which flare outwardly and upwardly from one side of the hollow supporting column and merge with a semi-cylindrical vertical wall 36 which is an extension of the opposite side of the column. The coins are poured in at the open top of the hopper and are intermittently fed from the hopper into the chute 26 by the plunger 28 which is moved upwardly, through an opening in the bottom of the hopper, to the level of the top of the chute. The sloping walls of the hopper cause the coins to settle toward the bottom, and as the mass diminishes, the coins will gradually slide toward the recess or pocket 38 which is formed above the plunger by the wall 36, so that there will always be a mass of coins directly over the plunger so long as any coins remain in the hopper. The plunger which is entirely retracted within the hollow column, when in its lowermost position, is partially housed by the semi-cylindrical wall 36, as the plunger moves up and down in the hopper. This wall 36 provides lateral support for the coins which are carried upward by the plunger and is formed at the top with an opening 40 to permit the passage of the coins into the chute 26 when the plunger is at the top of its stroke. The top face of the plunger is inclined toward the chute sufficiently to cause the coins to slide off the plunger and into the chute when the plunger reaches the top of its stroke, and the inclination of the chute is such that the coins will slide down the chute by gravity and be deposited in the coin pocket 22 of the separating device. Because of the inclination of the top face of the plunger toward the wall 36, the coins will tend to slide toward this retaining wall as they are elevated, rather than back into the mass in the hopper and consequently a greater number will be raised by the plunger than would be the case if its top face was level. For the purpose of facilitating the release into the chute of the coins which are raised by the plunger, the upper face of the plunger is provided with narrow parallel grooves 42, which extend toward the chute and serve to reduce any tendency of the coins to adhere to the top of the plunger due, for example, to dampness or the presence of foreign substance on the faces of the coins.

It is necessary, in order to prevent blockading, or clogging of the coins in the hopper, and to insure that the flow of coins from the mass in the hopper into the recess or pocket 38, as the plunger recedes, will not be interfered with, to provide suitable means for agitating the coins at each operation of the plunger. To this end the vertically disposed agitating rods 30, 32 and 34 are arranged alongside of the column 14 with their upper ends projecting through the bottom of the hopper. As the plunger rises, these rods are pushed upwardly together through the mass of coins and on the downward movement of the plunger, the rods are withdrawn. Thus the formation of the mass is distributed each time coins are fed from the hopper and the coins are not permitted to arrange themselves so as to prevent the settling or flowing of the mass to fill up the cavity left by the removal

of the last group of coins by the plunger. The agitating rods are located close to the column 14, the rods 30 and 32 being arranged on opposite sides thereof and adapted to rise in the hopper closely adjacent the corners formed by the junction of the wall 36 with the walls of the main part of the hopper, while the rod 34 is equidistant from the others and arranged to operate in a plane opposite the pocket 38.

The tops of all of the agitating rods normally project slightly above the bottom of the hopper, as shown by dotted lines in Fig. 1. The rods 30 and 32 which are rigidly connected by a cross bar 44 extend through and are guided by bearings 46 on the column 14, and are supported by springs 48, which surround the rods below the cross bar and rest upon the upper end of the bearings 46, while the rod 34 extends through a lug 50 formed on the cross bar and through a lug 52 projecting from a block 54, which is secured to the lower end of the plunger, and projects through a slot 56 in the column 14, the rod being supported by the engagement of the lug 50 on the cross bar with a collar 58 which is fixed on the rod. On the upward movement of the plunger, the lug 52 slides upward on the rod 34 and after the block 54 has come into contact with the cross bar 44 the three rods are raised in unison to points about midway between the bottom and the top of the hopper. On the downward movement of the plunger the rods will ordinarily be held in their elevated positions by the pressure of the mass of coins against them until the lug 52 on the block 54 engages a head 60 which is formed at the lower end of the rod 34 when the three rods will be retracted together from the hopper. The springs 48 serve to cushion the downward movement of the agitating device and prevent undue noise and shock from resulting therefrom, while a spring 62 surrounding the rod 34 above the collar 58 performs a similar function on the upward movement of the agitators. It will be observed that when the plunger is in its extreme lower position the spring 48 will be compressed and the rods will be retracted slightly more than shown in Fig. 1, thus permitting an unobstructed flow of coins along the bottom of the hopper and over the top face of the plunger.

The separating device 18 to which the coins are led by the chute 26 comprises the inclined rotary distributing plate or disk 24, and a stationary disk-shaped head 64 on which the distributing plate is supported and which is provided with a peripheral coin retaining wall 66 which partly surrounds the head. A peculiarly shaped curved wall 68 which is an extension of the wall 66 serves, in conjunction with the plate itself, to form the pocket 22 (Fig. 8) into which the coins are delivered from chute 26, while the peripheral wall 66 prevents the escape of the coins laterally from the separating device as they are being rotated with the distributing plate until they are ready to be finally delivered from the machine. The angle of inclination of the distributing plate 24 is greater than the angle of normal repose of the coins by an amount sufficient to insure the sliding of the coins by gravity toward the lower part of the plate. The distributing plate is supported by ball bearings 70 (Fig. 7) on the head 64, and is secured to a stud shaft 72 which is journaled in a bearing 74 at the center of the head, and has secured to its lower end a bevel gear 76. Meshing with the bevel gear 76 is a bevel gear 78 which is secured to the top of a vertical shaft 80 and driven, as will be hereinafter described, to cause rotation of the distributing plate. The head 64 is recessed to receive the distributing plate, in order that the upper surface of the plate shall be continuous with the marginal portion of the upper surface of the head 64, which extends slightly beyond the periphery of the plate so that the coins will lie flat as they pass from the plate across the upper surface of the head just before being delivered from the separating device. Centrally located on the upper surface of the distributing plate, by means of the shaft 72 which extends axially therethrough, is a stationary cylindrical block 82 which supports the lower end of the chute 26. The block 82 is held in contact with the plate 24 by a collar 84 fixed to the upper end of the shaft 72, and is held from turning with the shaft by virtue of the attachment thereto of one end of the curved wall 68. The coin receiving pocket 22 which is formed within the curve of the wall 68 is located quite low on the revolving plane of the distributing plate, and is so shaped and arranged as to readily receive the coins deposited by chute 26. The portion of the wall 68 which extends from the block 82 to a point opposite the discharge end of chute 26, and which forms the lowest portion of the coin pocket, rises sufficiently high above the surface of the plate to accommodate the mass of coins which are delivered from the chute 26, and gravitate toward the lower end of the pocket. This portion of the wall 68 is formed with a double flare, as indicated at 86 in Figs. 8 and 9, and serves to overcome any tendency of the coins to so arrange themselves that they will not be separated from the mass in the coin pocket, as for example by standing upright with their edges against the surface of the distributing plate, so that they will roll upon the rotating surface of the plate and not be moved thereby out of the coin pocket. The remaining portion of the

wall 68 diminishes in height as it extends toward the margin of the head 64 where it merges with the peripheral wall 66. For the purpose of preventing the escape of the coins between the end of the wall 68, adjacent to the block 82 and the discharge chute 26, the cylindrical face of the block 82 is extended upwardly at this point by means of the wall 88 as shown in Figs. 4, 5 and 9.

In order to effect the separation of the coins from the mass in the coin pocket 22, the upper surface of the distributing plate 24 is provided with a plurality of radiating feed strips or ribs 90 which serve to distribute the coins from the surface of the distributing plate. These feed strips project above the surface of the plate an amount equal to or slightly less than the thickness of the thinnest coin to be operated upon, which is the dime, and they extend outwardly from the cylindrical surface of the block 82, being inclined in the direction of rotation of the plate and falling somewhat short of reaching the periphery thereof. As the plate is rotated in a counter clock-wise direction, viewed from above, a limited number of coins are engaged by each feed strip as it passes beneath the mass in the pocket, and are elevated thereby, lying flat on the surface of the distributing plate, and being prevented from sliding to the center of the plate and back into the coin pocket by the block 82, the cylindrical sides of which constitute an abutment which will engage the innermost coin on each feed strip. It will be observed that it will be impossible for more than a single layer of coins to be thus separated from the mass by the action of the feed strips since the top face of the thinnest of the coins will be flush with or slightly higher than the upper surface of the feed strips, so that as the strip passes under the mass in the pocket a coin lying above another already engaged by the strip cannot itself be engaged thereby. As the coins which are being carried by the feed strips reach their highest position on the distributing plate, gravity causes them to slide down the inclined surface of the plate to the left of the block 82 in Figs. 4 and 9. As they slide downwardly some of the coins will strike the feed strip preceding the one by which they were elevated and will be diverted thereby toward the periphery of the plate. All of the coins eventually come into contact with the coin retaining wall 66, along which they slide until they reach an extension 92 of the inclined marginal edge of the head 64, across which they are delivered successively from the separating device. The speed of rotation of the distributing plate is such as to cause delivery of the coins from the separating device in a substantially continuous procession. As shown in the drawings, the coins may be delivered to the primary chute 94 of a sorting device such as that shown at 96 in Fig. 1. After the coins begin to slide downwardly on the distributing plate and to move away from the feed strips they quickly gain speed and in order to overcome any tendency of the coins at that time to tilt on their edges, the marginal portion of the head 64 and the upper surface of the plate 24 are covered by a plate 98 which is secured to the wall 66 on the left hand side of the separating device, as shown clearly in Figs. 4 and 9. A cover 100 of wire mesh may be provided as shown in Fig. 4 to inclose the top of the coin pocket 22 and prevent possible overflowing of the coins.

It is necessary to guard against the possibility of any coins, which may for any reason adhere to the surface of the distributing plate, becoming jammed between the edge of a feed strip and the outside of the wall 68 of the coin pocket 62, and thus clogging the mechanism. To this end the distributing plate is provided with a series of shallow grooves 102 concentric with the periphery of the plate, and into each groove projects a small pointed prong 104. The prongs 104 extend from a plate 106 which is secured to the wall 68 of the coin pocket 22 and have the function of dislodging the adherent coins and causing them to slide down the inclined face of the plate 24 and properly join the procession of other coins. The wall 68 is cut away on its under side adjacent to the surface of the plate 24, where it overlies the feed strips, sufficiently to permit the feed strip to pass thereunder. While none of the thicker coins are able to pass through the opening thus provided for the entrance of the feed strip into the coin pocket, the dimes, and more especially such of them as have been worn to less than normal thickness, may possibly do so. The prong 104, however, also performs the function of preventing the escape from the coin pocket of any dimes which may be thin enough to pass through this opening.

The mechanism may be operated from any suitable source of power. As shown an electric motor 108 drives the main shaft 110 continuously through a worm 112 on the motor shaft, which engages a worm wheel 114 on the main shaft. A bevel pinion 116 on the main shaft meshes with a bevel gear 118 on a shaft 120 to drive the latter shaft. This shaft 120, in turn, drives the vertical shaft 80, by means of which the distributing plate 24 is rotated, through intermeshing bevel gears 122 and 124 on the shafts 120 and 80 respectively. In addition to driving the vertical shaft 80 the shaft 120 also drives a crank shaft 126 through a pinion 128 on the shaft 120, which meshes with a spur gear 130 on the crank shaft. A crank arm 132 on

the crank shaft is operatively connected through a crank pin 134 and a link 136 with a lever 138 which is fulcrumed at 140. The connection is made at a point 142 between the fulcrum 140 and the opposite end of the lever 138 which projects through a vertical slot 144 in the supporting column 14 and is pivotally connected at 146 with the lower end of a link 148, the upper end of which is pivotally connected at 150 with the base of the plunger 28. Rotation of the crank shaft 126 causes oscillation in a vertical plane of the lever 138 which in turn causes reciprocation of the plunger 28. In order to provide means for conveniently connecting and disconnecting the mechanism from the main drive shaft, the bevel pinion 116 is mounted upon a sliding hub 152 which is splined to the main shaft, and an actuating rod 154 is connected with the hub through an arm 156 and extends to a position conveniently accessible to the operator where it is provided with a handle 158, in order that it may be manipulated to control the movements of the gear 116.

After the coins have been delivered by the present machine to a sorting device, such as that indicated generally at 96 in Fig. 1 and have been sorted and distributed to separate points, it may be desirable to count them. For this purpose suitable counting mechanism, not shown in the drawings, may be associated with the sorting device and arranged to be driven by the main shaft of the present machine. The means herein provided for connecting and disconnecting the mechanism of the present machine with the main shaft is of especial utility when counting mechanism is also operated by the main shaft, since it permits the operation of the former mechanism to be controlled without interfering with the operation of the counting mechanism. It is contemplated that the counting mechanism may be advantageously mounted upon the table which is shown in Fig. 1 as supporting the sorting device. With this in mind, the handle of the actuating rod has been so located that the operator will be able to manipulate it while at the same time watching the operation of the sorting and counting of the coins.

While it is preferred to employ the specific construction and arrangement of parts herein shown and described, it will be understood that this construction is not essential except so far as specified in the claims and may be modified without departing from the broader features of the invention.

The invention having been described, what is claimed is:—

1. A machine for operating upon coins having, in combination, an inclined separating plate upon which a mass of coins is delivered, an abutment for limiting the movement of the coins toward the center of the plate, a series of raised feed strips upon the upper face of the plate extending outwardly from the abutment and being inclined throughout their length in the direction of rotation of the plate, and means for rotating the plate.

2. A machine for operating upon coins having, in combination, a hopper for receiving a mass of coins, a plunger adapted to elevate a limited number of coins from the mass, means for reciprocating the plunger, and agitator rods reciprocating in the mass in parallelism with the plunger.

3. In a machine for operating upon coins, an inclined distributing plate having a series of feed strips projecting above its upper surface an amount less than the thickness of the thinnest coin to be operated upon, a wall for retaining a mass of coins in contact with the upper surface of the plate arranged with its lower edge closely adjacent the plane of the upper faces of the feed strips to prevent the escape of any of the coins beneath said wall.

4. A machine for operating upon coins having, in combination, a main hopper for receiving a mass of coins, a secondary hopper, means for delivering small and substantially uniform quantities of coins from the main hopper to the secondary hopper, and means for further separating the coins thus delivered to the secondary hopper.

5. A machine for operating upon coins having, in combination, a hopper for holding a mass of coins, a chute into which all of the coins in the hopper are finally delivered, a separating device between the hopper and the chute for receiving the coins from the hopper and delivering them in succession to the chute, a plunger adapted to successively discharge a limited number of coins from the hopper, and means for receiving the coins discharged from the hopper and guiding them to the separating device.

6. A machine for operating upon coins having, in combination, a hopper for holding a mass of coins, a chute into which all of the coins in the hopper are finally delivered, a separating device between the hopper and the chute for receiving the coins from the hopper and delivering them in succession to the chute, a second chute through which the coins pass from the hopper to the separating device, and means for elevating the coins to the top of the hopper and discharging them into said second chute.

7. A machine for operating upon coins having, in combination, a hopper for holding a mass of coins, a chute into which all of the coins in the hopper are finally delivered, a separating device between the hopper and the chute for receiving the coins from the hopper and delivering them in succession to the chute, a second chute ex-

tending from the top of the hopper to the separating device, a plunger adapted to reciprocate within the hopper and constructed and arranged to intermittently elevate numbers of coins to the top of the hopper and discharge them into the second chute, and means for reciprocating the plunger.

8. A machine for operating upon coins having, in combination, a hopper for receiving a mass of coins, a chute inclined downwardly from the top of the hopper, a plunger adapted to elevate limited numbers of coins from the mass in the hopper to the chute, the upper face of the plunger being inclined toward the chute to facilitate the discharge of the coins into the chute and grooved in the direction of the inclination of the chute to lessen the tendency of the coins to adhere to the plunger.

9. A machine for operating upon coins having, in combination, a hopper for receiving a mass of coins, a separating device comprising an inclined rotary distributing plate, means for rotating the plate, means for supporting a mass of coins in contact with the plate below the center of rotation of the latter, a raised feed strip on the plate extending outwardly from the central portion of the plate toward the periphery thereof for elevating the coins above said center of rotation of the plate and delivering them individually across said periphery, and a stationary block having a cylindrical surface normal to the plane of the plate for engaging the innermost coin on the feed strip to limit its inward movement.

10. A machine for operating upon coins having, in combination, a rotary distributing plate having a series of concentric grooves in its upper face, means for rotating the plate, a stationary wall constructed and arranged to retain a mass of coins in contact with the upper face of the plate below its center of rotation, a series of feed strips on said face adapted to pass under the wall and engage certain of the coins to separate them from the mass, each strip comprising a plurality of sections separated by said grooves, and prongs on said wall extending into said grooves for stripping the coins from the plate.

11. A machine for operating upon coins having, in combination, an inclined rotary distributing plate, means for rotating the plate, a stationary wall constructed and arranged to form in conjunction with the plate a pocket to retain a mass of coins, a portion of the wall being inclined relatively to the plate to overcome the tendency of the coins in the pocket to arrange themselves perpendicularly with respect to the plate so as to roll thereon as the plate rotates, and a feed strip on the plate for separating the coins from the mass and delivering them individually across the periphery of the plate.

12. A machine for operating upon coins having, in combination, an inclined rotary distributing plate, means for rotating the plate, a stationary wall constructed and arranged to retain a mass of coins in contact with the surface of the rotating plate below the center of rotation, and a raised feed strip on the plate for separating the coins from the mass and raising them above the center of rotation of the plate and causing them to be delivered separately across the periphery of the plate.

13. A machine for operating upon coins having, in combination, a rotary distributing plate, means for rotating the plate, a stationary wall constructed and arranged to form in conjunction with the plate a pocket to retain a mass of coins, a portion of the wall being formed with a double flare comprising an upper section inclining from the top of the wall inwardly toward the center of the plate to facilitate the introduction of the coins into the pocket and a lower section inclined from said upper section outwardly toward the periphery of the plate to overcome any tendency of the coins to arrange themselves perpendicularly with respect to the plate, and a feed strip upon the plate for separating the coins from the mass and delivering them individually from the plate.

14. A machine for operating upon coins having, in combination, a coin separating device comprising a rotary distributing plate, means for retaining a mass of coins in contact with the rotating surface of said plate, means on the plate for separating the coins from the mass and effecting their delivery in succession from the separating device, and means for preventing the coins from tilting onto their edges while being delivered from the separating device.

15. A machine for operating upon coins having, in combination, a coin separating device comprising a rotary distributing plate, a stationary wall adjacent the surface of said plate constructed and arranged to retain a mass of coins in a fixed location relatively to the rotating surface of the plate, a plurality of feed strips on the plate adapted to pass under the wall and to engage certain of the coins so as to separate them from the mass, and means for stripping from the distributing plate any coins which may tend to adhere thereto so as to prevent them from becoming jammed between one of the feed strips and the stationary wall.

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