C. L. LILLEBERG.

AUTOMATIC COIN COUNTING AND PACKAGING MACHINE.

APPLICATION FILED MAY 16, 1906.

915,100. Patented Mar. 16, 1909.

6 SHEETS—SHEET 1.

Fig. 1.

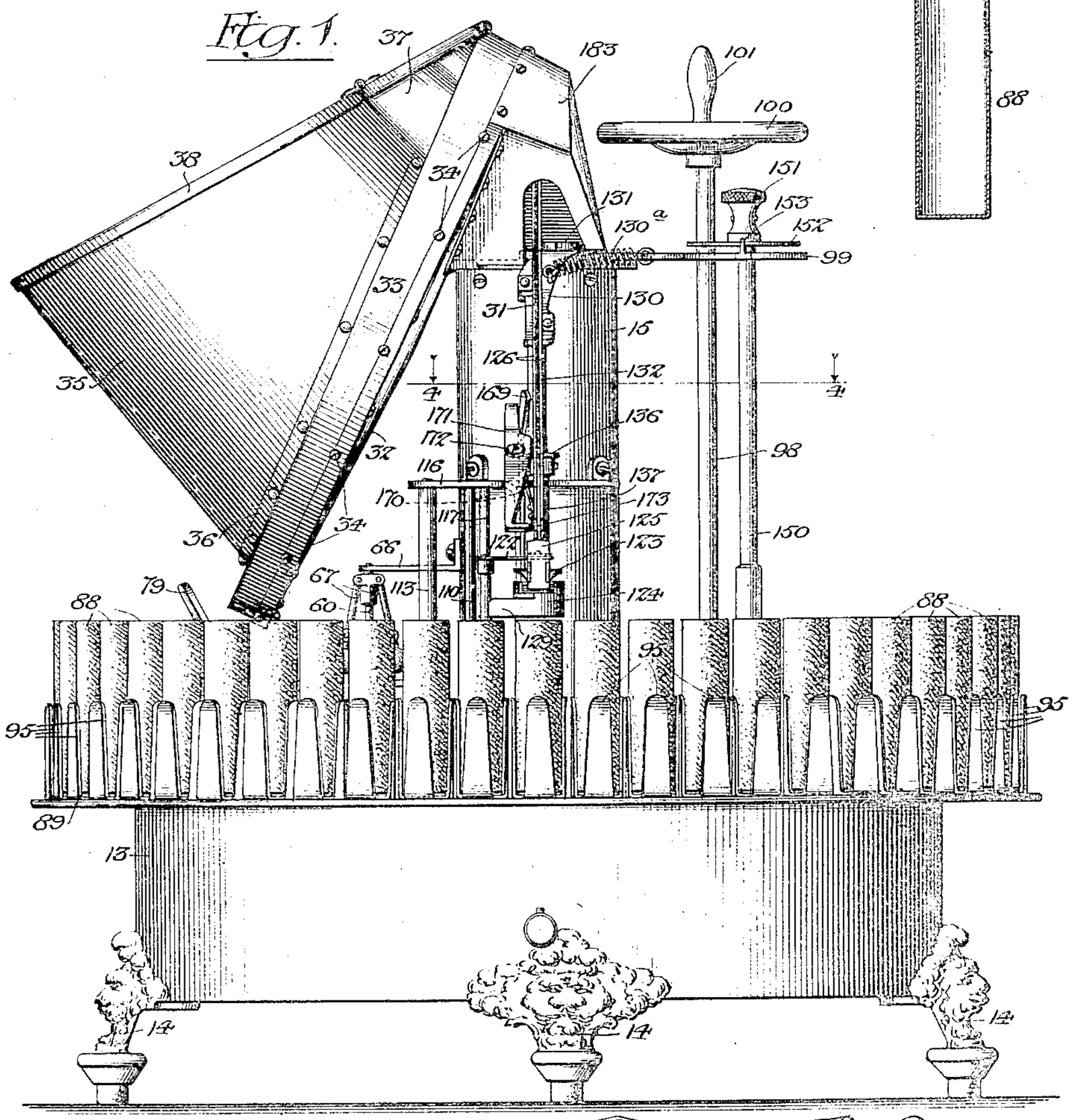
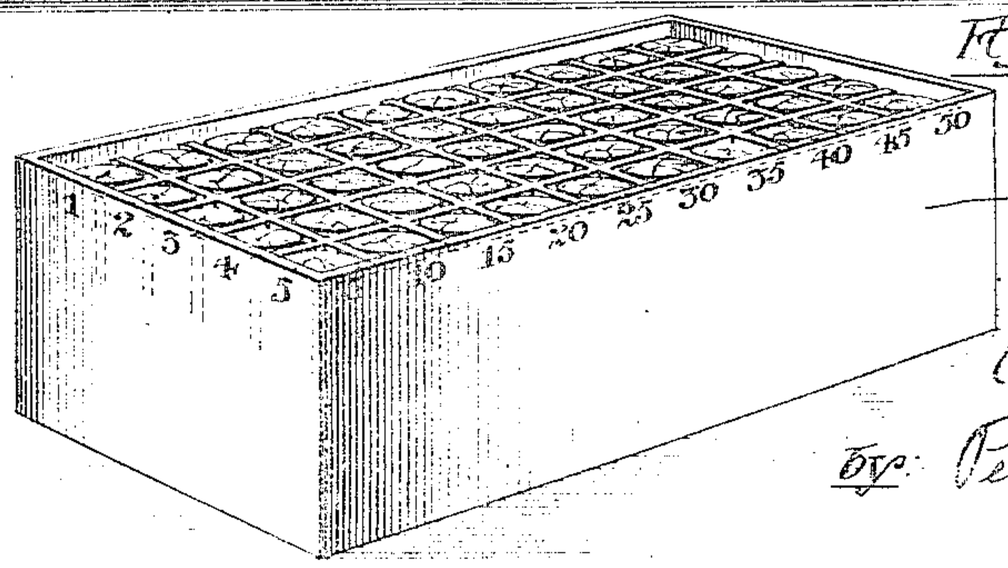


Fig. 3.

Fig. 2.



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6 SHEETS—SHEET 2.

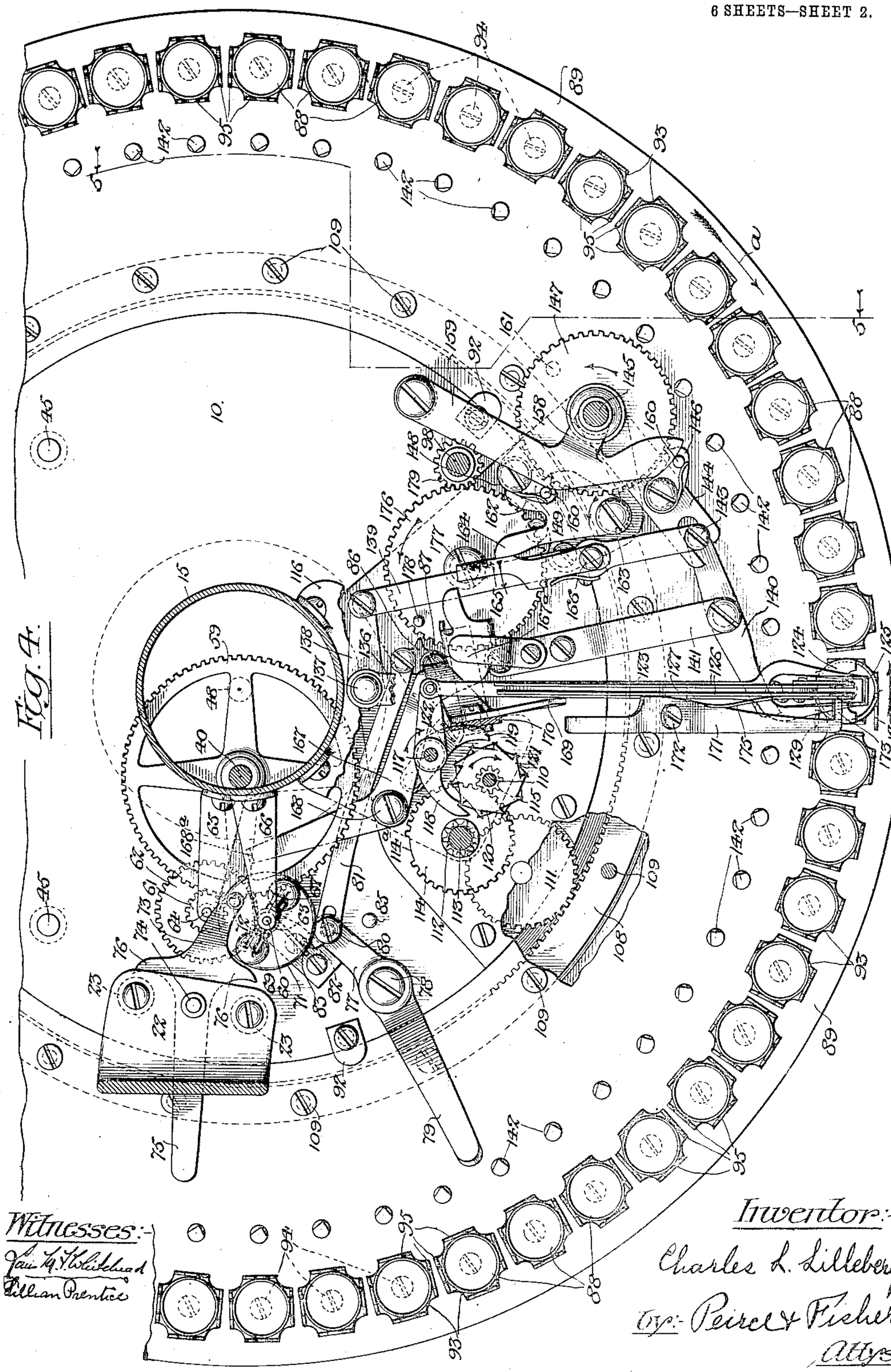

Fig. 4.

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6 SHEETS—SHEET 3.

Fig. 6.

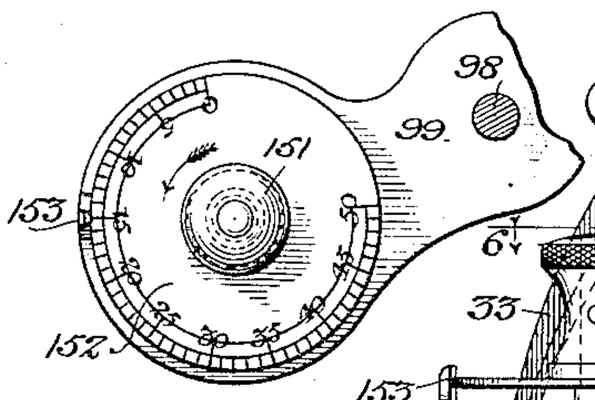

Fig. 5.

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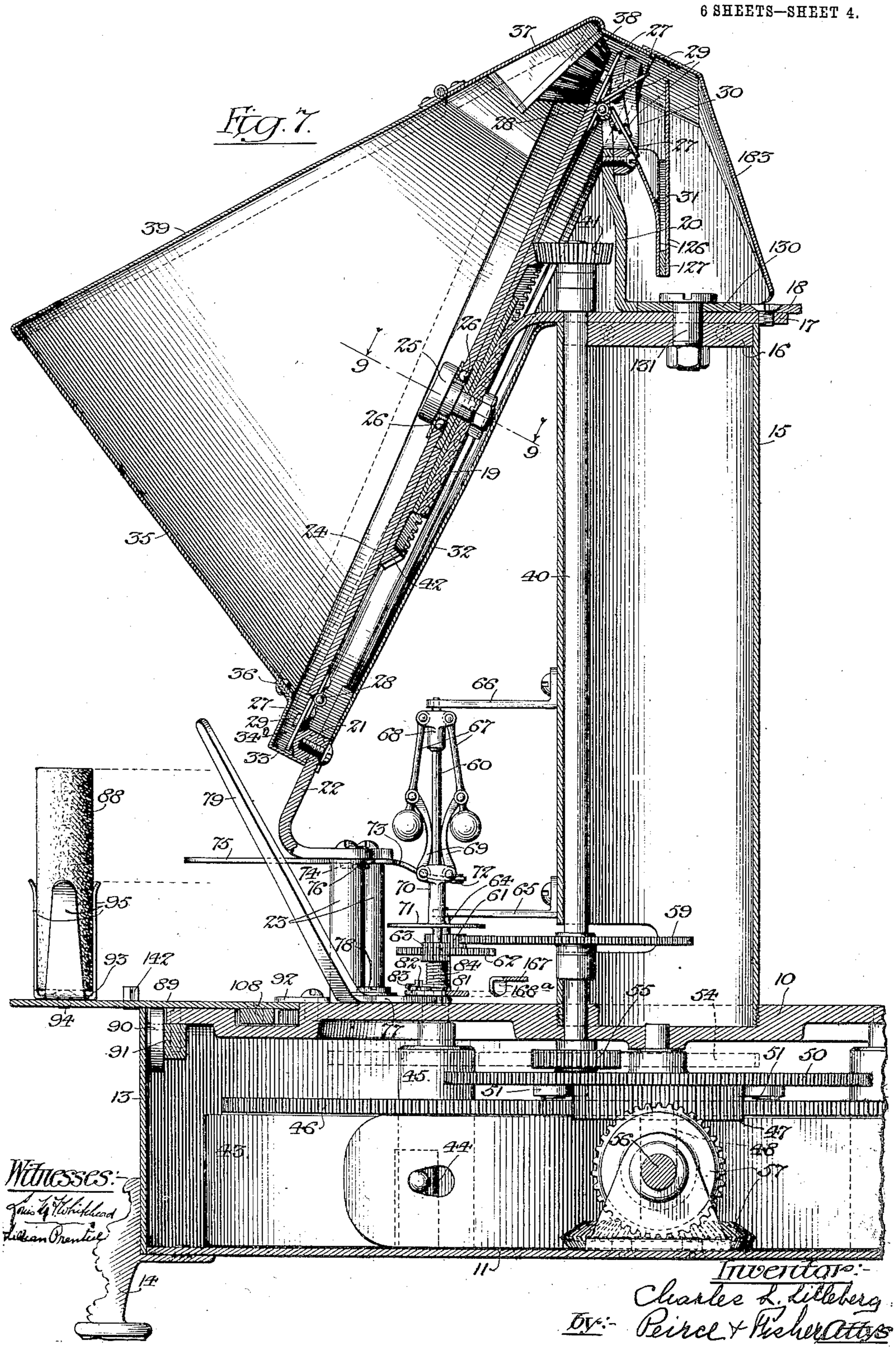
6 SHEETS—SHEET 4.

Fig. 7.



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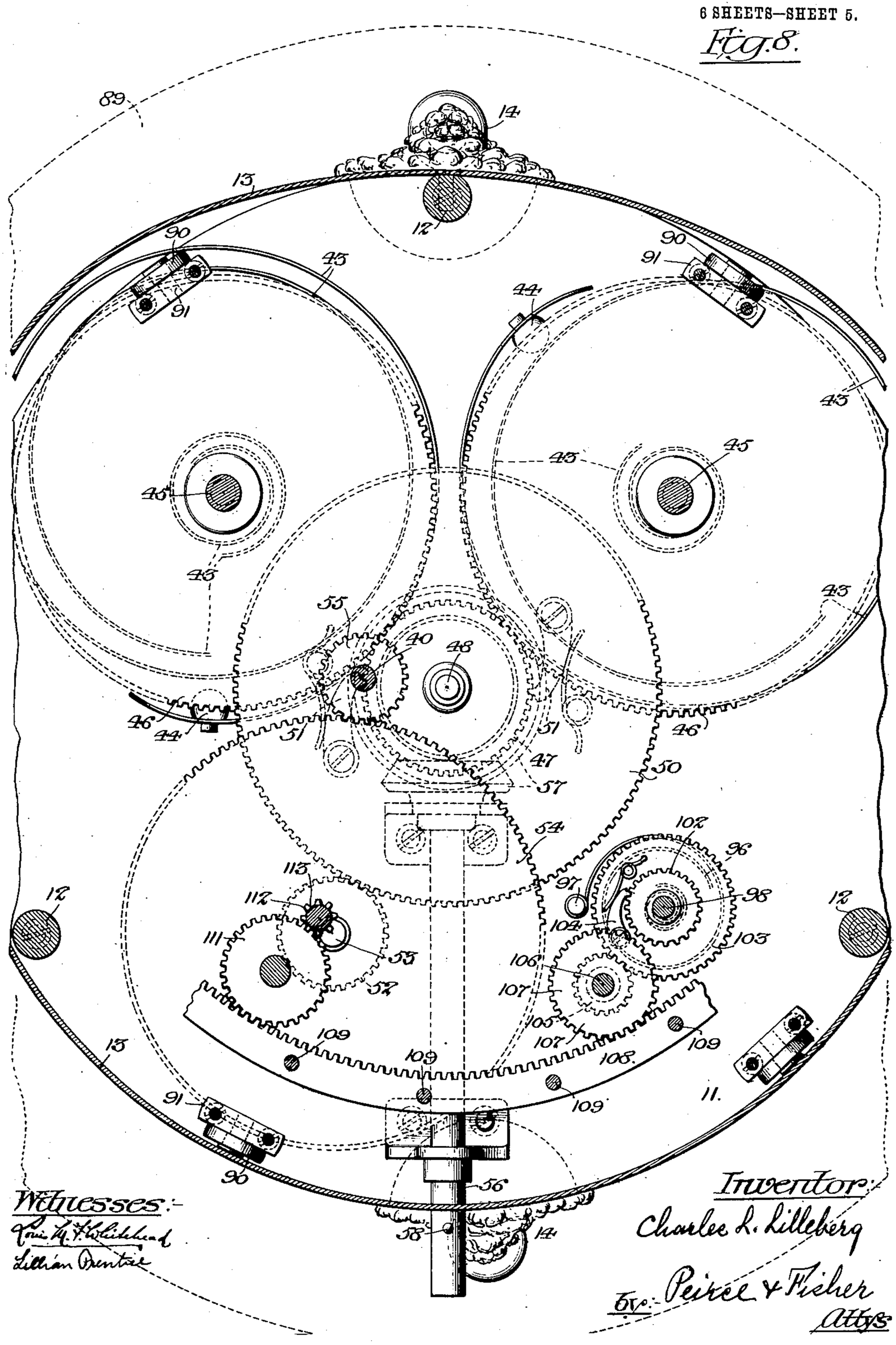
6 SHEETS—SHEET 5.

Fig. 8.



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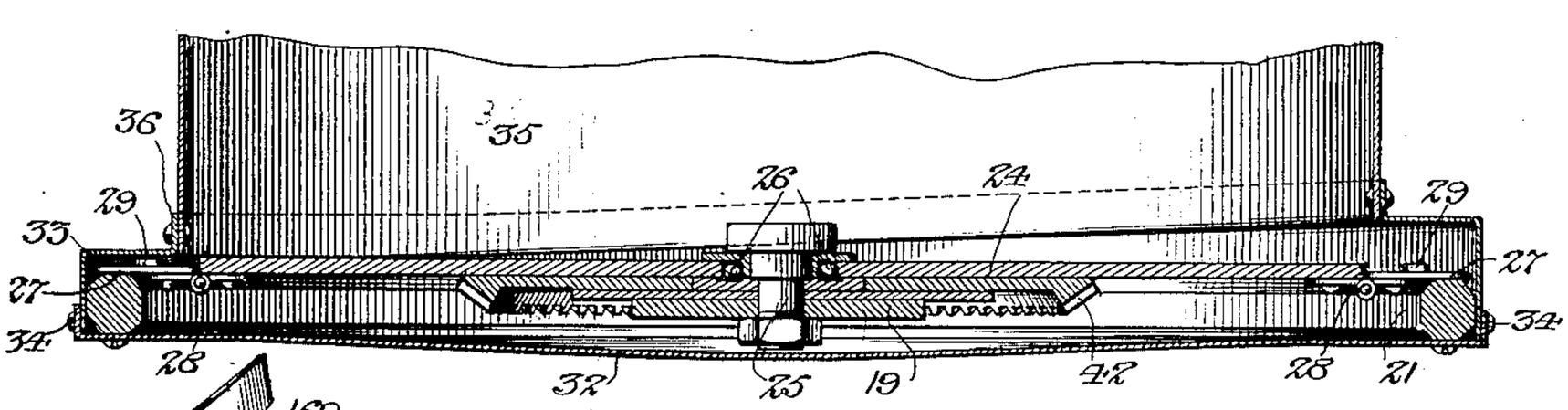
AUTOMATIC COIN COUNTING AND PACKAGING MACHINE.

APPLICATION FILED MAY 16, 1906.

915,100. Patented Mar. 16, 1909.

6 SHEETS—SHEET 6.

Fig. 9.



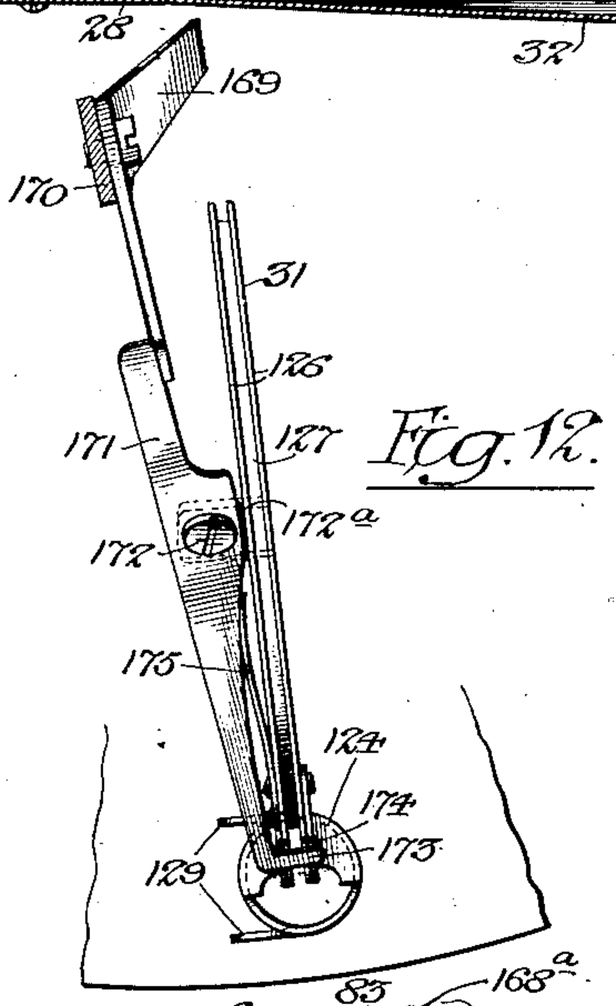


Fig. 12.

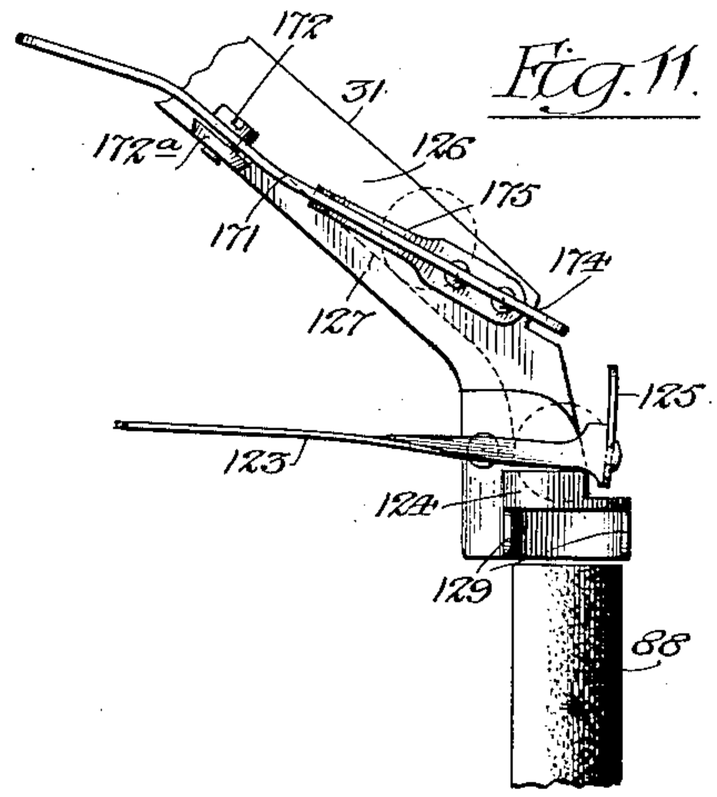


Fig. 11.

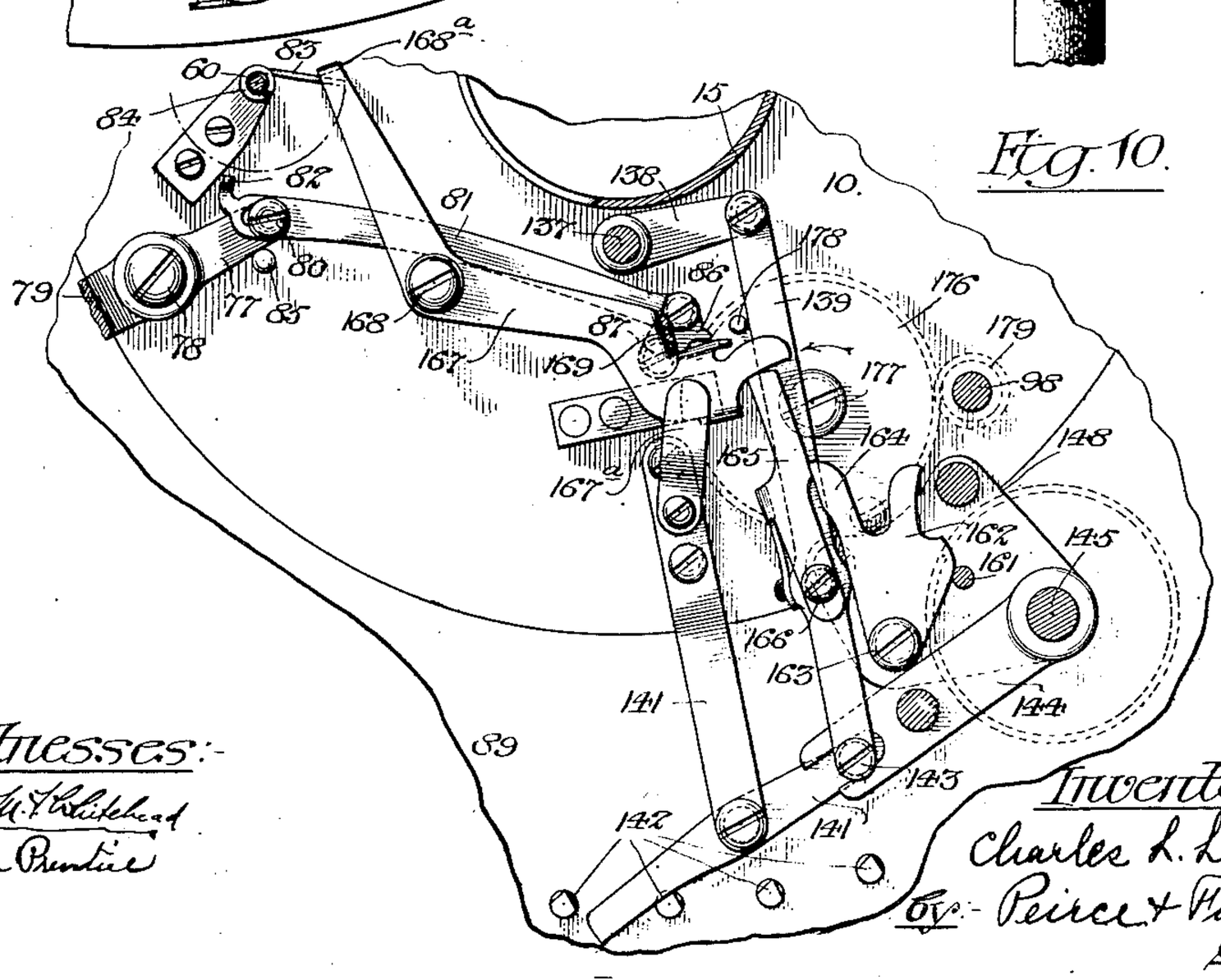


Fig. 10.

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UNITED STATES PATENT OFFICE.

CHARLES L. LILLEBERG, OF CHICAGO, ILLINOIS, ASSIGNOR TO JOHN B. MALLERS, JR., OF CHICAGO, ILLINOIS.

AUTOMATIC COIN COUNTING AND PACKAGING MACHINE.

No. 915,100. Specification of Letters Patent. Patented March 16, 1909.

Application filed May 16, 1906. Serial No. 317,092.

To all whom it may concern:

Be it known that I, CHARLES L. LILLEBERG, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Automatic Coin Counting and Packaging Machines, of which the following is a full, clear, and exact description.

The improvement relates to machines for counting and packaging coins and seeks to provide simple and effective mechanism by which coins may be accurately counted and packed in suitable cartons with a certain definite number of coins in each carton.

Further objects of the invention are to provide automatic operating mechanism and adjustable automatic stop mechanism for the machine so that by setting the adjustable stop mechanism the machine may be started and will then, without further attention, operate to count and pack any desired amount of coin, its operation being automatically arrested by the stop mechanism when the desired amount of work has been accomplished.

With these and other objects in view, the invention consists in the features of construction, combinations and arrangements of parts hereinafter set forth, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

The drawings illustrate the preferred embodiment of the present invention but it will be understood that the details of construction may be widely varied without departure from the essentials thereof.

Figure 1 is a view in elevation of the improved machine for counting and packaging the coins in cartons. Fig. 2 is a perspective view of a holding box or drawer for the filled cartons. Fig. 3 is a sectional view of one of the cartons employed. Fig. 4 is a partial plan view on an enlarged scale and with certain parts shown in section on the line 4—4 of Fig. 1. Fig. 5 is a partial elevation of the machine with certain parts shown in section on the line 5—5 of Fig. 4. Fig. 6 is a detail plan view with parts in section on the line 6—6 of Fig. 5. Fig. 7 is a partial central section through the machine. Fig. 8 is a plan view of the gearing in the base of the machine. Fig. 9 is a detail section of the feed hopper taken on the line 9—9 of Fig. 7. Fig. 10 is a detail plan view of a portion of the operating mechanism in shifted position. Fig. 11 is a detail elevation of the end of the coin chute. Fig. 12 is a detail plan view of the end of the coin chute with parts shown in shifted position.

The improved machine comprises a suitable hopper into which the coin to be counted is dumped. Feed mechanism in the hopper picks up the coins therein and delivers them one at a time, into a suitable feed chute by which they are in turn delivered to a carton at the end of the chute. The hopper feed mechanism is preferably driven by a motor that is provided with a governor for regulating its speed and having a shift lever by which the motor may be thrown into and out of operation. Suitable means are provided for holding a series of cartons and suitable mechanism is arranged to bring the chutes successively into operative relation with the series of cartons. Preferably, the cartons are held upon a suitable carrier and the mechanism shifts this carrier to bring the cartons successively in line with the end of the coin chute. Coin counting devices actuated by the passage of coin through the chute controls the shift mechanism so that as soon as a carton has received a certain definite number of coin the chute is brought into line with the next carton. In this way the several cartons are each filled with a certain definite number of coin and the total number may be readily ascertained by placing the filled cartons in a suitable box or drawer having a series of numbered pigeon holes of proper size to receive the cartons.

The frame of the machine comprises a base portion and an upright central standard. The base frame is formed by a cast base plate 10 and a lower bottom plate 11 (see Fig. 7) that are of circular outline and are secured together at their edges by studs or pins 12 (see Fig. 8). A ring 13 incloses the space between plates 10 and 11. This ring is secured by a screw to the rear stud 12 and is held in place against the edges of the plates 10 and 11 by a series of supporting feet 14 that have flanged portions engaging the ring 13 and the bottom plate 11, and that are fastened by screws to the bottom plate. The plates 10 and 11 and the ring 13 form a casing, in the form shown, for the operating motors to which access may be

had by removing the supporting feet 14 and ring 13.

An upright, hollow, cylindrical standard 15 is screw-threaded into a central depression in the base plate 10 and serves as a support for the upper ends of the coin hopper and chute and for the upper ends of the different controlling and operating shafts. A circular block or head 16 (see Fig. 7) is fixed within the upper end of the hollow standard 15. Two supporting strips or plates 17 and 18 are secured to the block 16. Plate 17 is provided with a downwardly extending portion 19 and the supporting strip or plate 18 is provided with an upwardly projecting portion 20.

The feed hopper comprises a ring-like frame 21 (see Figs. 7 and 9) that is held in inclined position and fixed at its lower end to the upper inclined portion of a bent supporting plate 22 (see Fig. 7) carried upon a pair of studs 23 that rise from the base plate 10. At its upper end the ring or frame 21 is secured to the upper end of the supporting arm or strip 20 on the standard 15.

Feed mechanism for the hopper comprises a circular disk or plate 24 that is journaled upon a central stud 25 to rotate in an inclined plane parallel with the plane of the ring or frame 21. The stud 25 is fixed to a downwardly inclined supporting arm 19, as shown in Fig. 7 and a series of balls 26 are preferably interposed between the stud and plate to reduce friction. At its edge the disk or feed plate 24 is provided with a series of plates 27 connected thereto by hinges 28. These plates are provided at one edge with a short projecting stud 29 for picking up the individual coins within the hopper and the plates normally rest upon the ring 21 which forms a support or guide for the plates. The guide ring 21 throughout its greater portion holds the plates 27 in line with the disk 24, but at its upper part and slightly beyond the center the ring is provided with an outwardly and downwardly bent curved portion 30 so that, at this point during the rotation of the feed disk 24, the plates 27 tilt backwardly to deliver the coins thereon into the upper end of a feed chute 31. The hinges 28, as shown, are secured to the back of the disk 24 and plate 27 so that when these parts are in line the edges of the plate will abut against the edge of the disk and they cannot swing farther in forward direction. The plates are however, free to tilt backwardly as indicated in Figs. 5 and 7, as the downwardly and outwardly bent curved portion 30 of the ring 21 is reached, to deposit the coin into the chute 31. In the normal position of the hinged plates 27 their back faces are in line with the back face of the feed disk 24. These plates are not as thick as the feed disk and this difference in thickness between the plates and disk and the thickness of the studs 29 on the plates is slightly less than the thickness of the coin for which the machine is designed.

The hopper or casing for the feed mechanism comprises a back plate 32 of sheet metal and having an out-turned edge secured to the ring frame 21. A sheet metal ring 33 that is right-angular in section throughout the greater portion of its length, fits within the flange of the back plate 32 and bolts 34 (see Figs. 5 and 9), extend through the ring 33 and the flange of the back plate and secure these parts to the ring frame or supporting guide 21. The angular sheet metal ring 33 extends outwardly and then inwardly over the hinged plates 27 and forms a feed way or groove 34^a over these plates. The sheet metal hopper 35 is secured to an outwardly projecting flange 36 on the ring 33 and the wall of the hopper is inclined at an acute angle to the inclined feed disk 24. The ring 33 is wider on one side than the other and the lower edge of the hopper is so shaped that the entrance to the feed groove 34^a above the hinged plates 27 is closed at a point beyond the upper delivery end of the feed disk. From this point the entrance to the feed groove and the feed groove itself gradually increases in width as shown. The inclined arrangement of the feed disk and walls of the hopper 35 and the arrangement of the entrance to the feed groove 34^a, insures that the coins indiscriminately placed within the hopper will be fed edge-wise into the feed groove and will not bridge across the entrance thereto. In the feed groove the coins are picked up by the lugs 29 on the hinged plates 27 and as the plate rotates in the direction of the arrow shown in Fig. 5, will deliver them one at a time into the coin chute. If more than one coin is picked up by a plate the upper coin will fall back into the hopper as soon as it reaches the upper open portion of the feed groove, since the difference in thickness between the disk and hinged plates is only sufficient to support a single coin on the edge of the disk when the hinged plates during the rotation of the disk reach a point above the central portion thereof. This will be the case even though the coins may be worn and thin, since the difference in thickness between the hinged plates and disk is less than the thickness of an unworn coin. In the machine shown, the distance between the upper surfaces of the disk and plates is about two thirds the thickness of a normal coin for which the feed mechanism is designed. At its upper part the ring 33 is enlarged and bent outwardly as shown, to form a portion 37 of the top of the hopper so that if any one of the hinged plates 27 carries along two coins the uppermost coin will be free to drop back into the hopper. To further insure the delivery of the coin one at a

time only to the coin chute, a brush 38 having stiff bristles (see Fig. 7) is fixed to the portion 37 of the ring 33 in advance of the discharge opening and the space between the face of this brush and the hinged plates 27 is only sufficient to permit the passage of coins edgewise one at a time. The hopper, if desired, may be provided with a hinged cover 39.

Feed disk 24 is driven from a vertical shaft 40 that extends upwardly through the central standard 15 near one side thereof and is journaled at its ends in the base plate 10 and in the head or block 16 in the upper end of the hollow cylindrical standard. A beveled pinion 41 on the upper end of the shaft engages a beveled gear 42 fixed to the rear face of the feed disk 24. The stud 25 extends through the gear and the latter is arranged between the inclined support 19 and the back face of the feed disk. Shaft 40 may be driven from any suitable sort of motor, and, for this purpose in the form shown, a spring motor is arranged within the base portion of the machine. The motor comprises a pair of heavy coiled springs 43 fixed at one end to studs 44 mounted on the bottom plate 11 and at their other ends to upright stud shafts 45 journaled in the base and bottom plates 10 and 11. Gears 46 on the shafts 45 (see Figs. 7 and 8) engage a gear 47 fixed to a central stud shaft 48 journaled in the base and bottom plates 10 and 11. The gear 47 is wider than the gears 46 and a gear 50 loose on the shaft 48 is driven from the gear 47, when the springs 43 unwind, through the medium of spring-held pawls 51 pivoted on the under face of the gear 50 and engaging the upper portion of the gear 47. The gear 50 meshes with a pinion 52 (see Fig. 8) on a stud 53 and a gear 54 connected to the pinion 52 drives a pinion 55 on the lower end of the main operating shaft 40. When the springs unwind the gearing is such that the feed plate is driven by the clock train of gearing described in the direction of the arrow shown in Fig. 5. Gears 47 and 46 are rotated in the opposite direction to wind up the springs 43 by a horizontal shaft 56 that is connected to the short upright shaft 48 by a pair of beveled gears 57. Shaft 56 is journaled in suitable brackets on the bottom plate 11 and projects through an opening in the ring 13. Its outer end is provided with a pin 58 which may be engaged by a suitable handle slipped over the end of the shaft to wind up the motor springs 43. When the springs are wound up the pawls 51 slip idly over the teeth of the gear 47.

A gear 59 (see Figs. 4 and 7) on the lower end of the shaft 40 projects through a slot in the hollow standard 15 and drives a vertical governor shaft 60 through a train of gears 61, 62 and 63. Gears 61 and 62 are mounted on a short vertical shaft 64 journaled in the base plate and in an arm 65 fixed to and projecting from the standard 15. Gear 63 is fixed to the lower end of the governor shaft that is journaled at its ends in the base plate 10 and in an arm 66 fixed to and projecting from the standard 15. Any suitable form of governor may be employed. In the form shown a pair of weighted governor arms 67 are pivoted to a collar 68 that is fixed to the upper end of the governor shaft 60. Links 69 connect the governor arms to a sleeve 70 that is free to slide on the governor shaft. In operation, the governor arms are thrown outwardly by a centrifugal force and raise a friction disk 71 on the lower end of the sleeve 70 up until it engages a friction button 72 of rubber, soft leather or like material on the end of a spring arm 73 so that the speed of rotation of the feed disk is maintained at a uniform rate. Arm 73 is pivoted by a stud 74 (see Fig. 4) to the under side of the horizontal portion of the bent plate 22 and is provided with an extending handle portion 75 by which the spring arm 73 may be shifted to move the friction button 72 toward and away from the center of the friction disk 71, so that the amount of friction between the disk and button is varied to change the rate of speed. Lugs 76 on the sides of the arm 73 are arranged to engage the upright studs 23 to limit the extent of movement of the arm. It will be noted that the drive springs are at one end of the gear train and the governor at the opposite end so that all lost motion in the train is taken up and the feed disk 24 will be driven smoothly and steadily and at a uniform rate of speed to deliver the coins to the chute 31.

A controlling lever 77 is pivotally connected by a stud 78 to the base plate 10 and is provided with an upwardly and outwardly projecting handle portion 79. The end of the lever 77 is provided with a stud 80 arranged to engage a short slot in the end of a link 81. The link is provided on its projecting end (see Figs. 4, 7 and 10) with a lug 82 that is arranged to engage a yielding stop arm 83 on the governor shaft. This stop arm is preferably formed of spring wire and has a coiled portion 84 wound around and connected at its end to the governor shaft. By shifting the controlling lever 77 until it engages a stop 85 on the base plate, (see Fig. 10) stud 82 on link 81 is moved out of the path of movement of the yielding arm 83 so that the spring motor described may drive the feed disk in the hopper. By returning the lever, stud 82 is returned into the path of movement of the yielding arm 83 and the operation of the machine is arrested. The opposite end of the link 81, for a purpose hereinafter set forth, is connected to a pawl 86 that is pivoted by a screw or stud 87 to the base plate 10.

The coins are delivered by the mechanism described into a series of cartons and counting mechanism controlled by the movement of the coins through the chute, is arranged to bring the cartons successively beneath the end of the chute, the operation being so timed that each carton is filled with a certain definite number of coin. Cartons 88 are preferably arranged upon a suitable carrier in the form of a flat ring 89 that is supported on the edge portion of the base plate 10 and surrounds the raised central portion thereof. The carrier plate or ring 89 preferably rests upon anti-friction rollers 90 (see Figs. 7 and 8) journaled on blocks 91 that are fixed to and depend from the edge of the base plate 10. The ring or carrier plate is held against vertical movement by clips 92 (see Figs. 4 and 7) fixed to the raised portion of the base plate and projecting over the inner edge of the ring or carrier. Adjacent its edge the ring carrier 89 is provided with a series of carton holders, each having a base portion 93 secured to the carrier plate by screws 94 and four upwardly projecting spring fingers 95 having out-turned upper ends to permit of the ready insertion of the cylindrical cartons 88. The ring carrier is driven to move the cartons by means of a spring motor comprising a pair of coiled springs 96 (see Figs. 5 and 8) arranged within the base portion of the machine and fixed at one end to a stud 97 on the bottom plate 11 and at their other ends to a vertical shaft 98 that is journaled in the base portion and projects upwardly therefrom. The upper end of this shaft extends through a horizontal projection 99 on the plate 18 that is fixed to the upper end of the standard and the upper end of the shaft is provided with a wheel 100 having an operating handle 101 by which the springs 96 may be wound up. A gear 102 fixed to the shaft drives a gear 103 loosely mounted thereon through the medium of a spring-held pawl 104 that is pivoted on the gear 103. Gear 103 meshes with a pinion 105 on a short shaft 106 journaled in the base portion and this shaft carries at its upper end a gear 107 that meshes with a large internal annular gear 108 secured by screws 109 to the lower face of the ring carrier 89. The annular gear 108 (see Figs. 5 and 7) is arranged within a groove or depression in the base plate 10. The movement of the carton carrier is effected by the train of gearing described when the springs 96 unwind. These springs may be wound up by means of the handle 101 and wheel 100 without affecting the train of gear, at which time wheel 102 moves idly beneath the end of the spring-held pawl 104.

The movement of the ring or carton carrier is controlled by coins delivered by the feed mechanism, and in the form shown the coins control a suitable escapement mounted on a shaft 110. This shaft is driven from the rack 108 through the medium of the gear 111 (see Fig. 4) which meshes with a pinion 112 on the lower end of a shaft 113. A gear 114 on the shaft engages a pinion 115 on the escapement shaft 110. Shafts 110 and 113 (see Fig. 5) are journaled at their lower ends in the base plate 10 and at their upper ends in a horizontally disposed plate 116 which is fixed to and projects from the central standard 15. A third shaft 117 journaled between the base plate 10 and horizontal plate 116 carries an anchor or pair of escapement pawls 118 and 119. The escapement shaft 110 is driven in the direction of the arrow shown in Fig. 4, and is provided with two escapement wheels 120 and 121 which are arranged to coöperate respectively with the escapement pawls 118 and 119. The teeth of the escapement wheels 120 and 121 have inclined tangential and substantial radial, abrupt faces and the teeth project, as shown, in opposite directions. The abrupt faces or points of the teeth of the lower wheel 120 coöperate with the notched end of the escapement stop pawl 118, which is normally in engagement with one of these teeth. When the pawl shaft 117 is moved slightly in the direction of the arrow shown in Fig. 4, stop pawl 118 is disengaged from the tooth of the wheel 120 and the feeding or controlling pawl 119 is brought against the inclined face of one of the teeth of the upper wheel 121. This wheel then tends to rotate the escapement pawls back so that the stop pawl 118 engages the next tooth of the escapement wheel 120.

Escapement shaft 117 is provided with an arm 122 and a link 123 is pivoted at its rear end to the arm. The outer end of the link is forked and extends on opposite sides of the down-turned outer end of the coin chute 31. This forked outer end is supported on an enlarged head 124 at the lower end of the chute and a short vertical plate or abutment 125 fixed between the ends of the forked part of the link 123, is arranged to be struck by the coins sharply as they run down the inclined coin chute 31. The link 123 and arm 122 are made of very thin light strips of steel of less weight than a single coin so that the escapement mechanism is operated accurately and rapidly by the successive coins as they run down through the chute. The necessary motion of the escapement is very slight and as stated, the coins are heavier than the moving parts and acquire considerable momentum so that they strike the abutment plate 125 on the link 123 a quick sharp blow to operate the escapement with absolute accuracy once for each coin passing through the chute.

The coin chute comprises a pair of side plates 126 arranged on edge and fixed to a bottom strip 127. At its upper end the side plates are flared outwardly (see Fig. 7) to

readily receive coins from the feeding mechanism of the hopper. The chute is arranged in inclined position as shown (see Fig. 5) and its lower end is turned down and provided with a cylindrical ring or head 124 upon which, as stated, the forked end of the link 123 rests. The head or ring 124 corresponds in size to the cartons and during operation, is accurately centered over one of the cartons on the carrier plate 89. One side of the ring (see Fig. 11) is cut away and provided with laterally projecting arms 129 as shown in Figs. 4 and 11. At its upper end the coin chute is secured with a downwardly inclined portion of an arm 130, the upper horizontal portion of which extends over the upper end of the standard and sets within a recess in the plate 18 thereon. A stud 131 forms a pivot about which the chute may swing to a slight extent. The lower end of the chute supporting arm 130 engages an upright pin 132 (see Fig. 5) carried by a crank arm 136 on the upper end of a rock shaft 137. This rock shaft is journaled at its lower end in the base plate 10 and in its upper end in a horizontal plate 116 through which it projects to a slight extent. At its lower end (see Figs. 4 and 10) shaft 137 is provided with a crank arm 138 that is connected by an outwardly projecting link 139 to the end of a controlling lever 140. This controlling lever is centrally pivoted upon the end of a supporting arm 141 that is fixed at its inner end to the edge of the base plate 10 and projects outwardly over the ring or carton carrier 89. The free end of the controlling lever or pawl 140 is arranged to engage successively with the angle faces of a series of short studs or pins 142 fixed to the ring or carton carrier 89. A spring 130^a extending between the chute supporting arm 130 and the horizontal projection 99, tends to move the chute and shaft 137 in the direction of the arrow *b* shown in Fig. 4, so that the controlling lever or pawl 140 is yieldingly spring-held against one of the pins 142. As shown in Fig. 4, there is one of these pins 142 for each carton holder on the carrier or carrier ring 89 and the edge of the controlling lever 140 that engages the pins is cam-shaped and of such form that when engaging one of the pins, it holds the end of the coin chute accurately in line with the carton in the corresponding holder. It also serves to move the coin chute step by step and maintain its delivery end in line with the carton as the carrier plate is advanced step by step through the action of the escapement which in turn, is controlled by the passage of the coin through the coin chute. The space between the pins is such that when a certain definite number of coins have been delivered into any one carton, the corresponding pin 142 passes from beneath the end of the controlling lever or pawl 140 which is then swung by spring 130^a into engagement with the next pin and brings the end of the chute into line with the next empty carton therein. It will be understood that the carrier plate 89 is rotated step by step under control of the coins passing through the chute in the direction of the arrow *a* shown in Fig. 4, and the coin chute is spring-held and tends to move in the direction of the arrow *b*, but nevertheless moves with the carrier and at all times is in line with one of the cartons until the corresponding pin 142 passes beneath the end of the controlling lever 140 when the controlling lever moves into engagement with the next pin and the chute is swung by its spring in the direction of the arrow *b* into line with the next empty carton. The pins 142 are so spaced and the gearing between the escapement and carrier ring 89 is such that the coin chute will be quickly shifted after a certain definite number of coins (in the present instance 50) have been deposited in any one carton. It will be observed that the gear 114 on the counter shaft 112 is mutilated at one portion (see Fig. 4) and this mutilated portion 114^a comes into line with the pinion 115 on the escapement shaft just as the pin 142 is about to pass from beneath the controlling lever 140, so that at this time the carrier plate moves through a much longer step than at the other operations of the escapement. In the form shown, the gear 114 rotates through a single revolution at each 50 operations of the escapement mechanism and at the same time the carrier plate travels through an arc equal to that between the pins 142 and by mutilating or omitting some of the teeth of the gear 114, which mutilated portion comes in line with the pinion on the escapement shaft at about the time one of the pins 142 passes from beneath the end of the controlling lever, the coin chute will be invariably shifted after it has deposited 50 coins in any one carton. With this arrangement, it is not necessary to adjust the pins 142 with absolute accuracy as would otherwise be necessary.

Suitable mechanisms are provided for automatically arresting the operation of the machine when it has been operated sufficiently to fill any desired number of cartons. For this purpose, pin 143 on the end of the controlling member 140 is arranged to engage the slotted end of an arm 144 which in turn, is pivoted to the lower end of a short upright shaft 145. A spring-held feed pawl 146 on the arm 144 is arranged to engage the teeth of a ratchet or gear wheel 147 on the shaft 145. By this arrangement gear 147 and shaft 145 are rotated one notch in the direction of the arrow shown in Fig. 4 for each carton that is filled during the operation of the machine. Shaft 145 (see Figs. 4 and 5) is journaled at its lower end in a plate 148 that is fixed to the base plate 10 and projects outwardly therefrom over the ring plate or

carrier 89. A spring-held retaining pawl 149 is arranged to engage the ratchet wheel 147 and prevent backward rotation thereof. The shaft 145 (see Fig. 5) is set within the lower hollow end of a shaft 150 that is journaled in its upper end in the off-set plate 99 and carries above the latter plate a turn button 151 and a circular dial scale 152 which coöperates with a stationary pointer 153 on the plate 99. Shaft 150 is connected to rotate with the shaft 145 by a pin 154 thereon extending through a slot 155 in the side of the lower hollow or socketed portion of the shaft 150. A coiled cushion spring 156 interposed in the socket of the shaft 150 above the upper end of the shaft 145, normally holds the shaft 150 in uplifted position.

At its lower end the shaft 150 is provided with a conical cam member 157 that is arranged to engage a lug 158 (see Figs. 4 and 5) upon the side of an arm 159 which is pivoted at its end to the base plate. The arm 159 is arranged to engage pins 160 on the driving and retaining pawls 146 and 149 and by grasping the knob 151 on the upper end of the shaft 150, the latter may be depressed against the tension of the spring 156 to move the arm 159 and throw the driving and retaining pawls out of engagement with the teeth of the wheel of the gear 147 so that the latter may be turned in reverse direction.

The scale on the dial 152 is numbered as indicated, and the marks thereon correspond with the teeth on the wheel 147 so that this dial is moved one space on the scale when each carton is filled. The scale dial 152 is ordinarily driven, during the operation of the machine in the direction of the arrow shown in Fig. 6. If the user of the machine desires to fill, for example fifteen cartons and count out the corresponding amount of money, he will release the dial 152 and ratchet wheel 147 as described, by depressing the shaft 150 and will then adjust the dial to bring the scale point 15 opposite the pointer 153. The zero point on the scale will then be brought opposite the pointer when fifteen cartons have been filled. As the last carton is filled, a pin 161 (see Figs. 4, 5 and 10) on the under side of the gear 147 will engage a swinging arm 162 that is pivoted by a pin 163 to the supporting plate 148. The engagement of the pin 161 with the arm 162 will force it in the direction of the arrow shown in Fig. 4 and a lug 164 on the arm 162 will move a catch 165 on the link 139 in the same direction. This catch 165 is connected by a pivot stud 166 to the link 139 that connects the controlling member 140 to the rock arm 138 on the shaft 137. The catch is normally spring-held toward the lug 164 on the arm 162 but, as stated, when the dial approaches the zero point the catch will be pushed in the direction of the arrow shown in Fig. 4 into position behind the end of a lever 167 (see Fig. 10) which is pivoted to the base plate 10, by a stud 168. When the last carton of the desired number is filled, pin 142 passes from beneath the end of the controlling lever 140 and the latter shifts into engagement with the next pin. At the same time the catch 165 on the link 139 shifts the stop arm 167. The opposite end of the stop arm is provided with a depending lug 168[a] (see Figs. 4, 7 and 10) which is shifted by this movement into the path of the yielding arm 83 on the governor shaft so that the operation of the coin feeding mechanism is automatically arrested. This position of the parts is shown in Fig. 10. One end of the stop arm 167 also engages the lower end of a swinging arm 169 (see Figs. 4 and 5) which is pivoted intermediate its ends upon a lug 170 that depends from the horizontal plate 116, and the movement of the stop arm 167 so shifts the arm 169 as to bring its upper end into line with the stop lever 171 which is pivotally connected between its ends by a stud 172 to a cross lug 173 at the lower portion of the coin chute. The forward end of the stop arm 171 is provided with a hook 173 which is arranged to project through cut-away portions 174 (see Fig. 5) in the side walls 128 of the coin chute and into the path of the coin therein. Arm 171 is normally held by a leaf spring 175 out of the path of the coin in the chute, but when the arm 169 is projected, as described, into line with the end of the stop arm 171, the latter, when the coin chute shifts in the direction of the arrow *b* (see Fig. 4) is engaged by the arm 169 and its forward hooked end is quickly shifted into the path of the coin in the chute (see Fig. 12) to arrest the further passage of the coin therethrough after the desired number of cartons have been filled.

When the machine is in operation the starting and stopping lever 77 is against the stop 85 and in this position the link 81 is so shifted that the pawl to which it is connected engages the teeth of the gear 176 journaled by a stud 177 to the plate 148. This gear carries a pin 178 which is arranged to engage the end of the automatic stopping lever 167 and restore it to normal position. To restore the automatic stop lever the operator must first release the dial 152 and gear 147, as described, and shift the pin 161 away from the arm 162 so as to permit the restoration of the arm 162 and spring-held catch 165 to normal. The operator must then turn gear 176 in the direction of the arrow, as shown in Figs. 4 and 10 to bring the pin 178 thereon into engagement with the stop lever 167 to restore it to normal position. This shift of the gear 176 is effected by a pinion 179 on the winding shaft 98 for the spring motor 96, but the operator cannot turn this shaft and gear until he first shifts the controlling lever 77 to throw the pawl 86 out of engagement

with the teeth on the gear 176. This shift of the controlling lever 77 brings the lug 82 on the link 81 into the path of the movement of the yielding stop 83 on the governor shaft. Then when the operator restores the stop mechanism to normal through the medium of the winding shaft 98 and pin 178 on the gear 176 and thus releases the governor arm 83, the latter is arrested after a half-revolution by the stud 82. By this arrangement, when the machine is automatically arrested, it cannot be restored to normal position and set free for further operation without restoring the hand-operated lever 77 to such position that it will arrest the operation of the machine. Moreover, the arrangement compels the rewinding of the spring motor 46 which drives the carton carrier or ring 89 and also compels the resetting of the stop wheel 147 and dial 152.

By filling the holders on the carrier 89 with empty cartons and properly adjusting the dial 152, the machine may be automatically set into operation to count and fill any desired number of cartons, each with a certain definite number of coins. When the machine is once set in operation no further attention need be given to it.

The cartons employed are preferably of stiff paper or paste-board (see Fig. 3) having an upward extension of thinner paper which may be folded down upon the coins when the carton is filled. By arranging the coins within a box or drawer 180 having a series of numbered pigeon holes of proper size to receive the cartons, the exact number of coins in one or more drawers may be readily ascertained by the use of the improved machine. The coins are counted and packed in the cartons so that they remain counted. The operation of the machine is accurate and entirely automatic when once started.

As shown the bottom plate 32 of the hopper is cut away (see Fig. 5) contiguous to the discharge opening of the hopper. An irregular cap plate 183 (see Figs. 1 and 7) is secured over this opening and is provided with a slot through which the coin chute extends.

The machine may be readily adapted for counting different sized coins by changing the feed disks and carton carrier, or if desired, interchangeable disks and carriers may be provided in a single machine for counting the coins of different denominations. For a series of machines, one for each denomination could be used and all driven from a common source of power. It should be noted that the counting is effected by the coins themselves as they are fed into the cartons, so that the machine will operate with absolute accuracy.

It is obvious that other changes could be made in the details of construction without departure from the essentials of the invention.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. In a coin counting and packaging machine, the combination with a movable coin chute for depositing the coins in suitable cartons or packages, of a hopper, feed mechanism in said hopper for delivering the coins one at a time to said chute, and means controlled by the passage of coins through the chute for determining the number of coins deposited in each carton and automatically shifting said chute to the next carton.

2. In coin counting and packaging machines, the combination with an inclined coin chute for depositing the coins in suitable cartons or packages, of a hopper having a discharge opening in its upper part and having an inclined bottom and oppositely inclined side walls, a rotary feed plate in the bottom of said hopper for delivering the coins one at a time through said discharge opening into the upper end of said chute and counting mechanism controlled by the passage of coins through the chute for determining the number of coins deposited in each carton.

3. In a coin counting and packaging machine, the combination with a concentrically arranged automatically movable carrier for a plurality of suitable cartons or packages, of mechanism for depositing coins successively in the cartons or packages on said carrier and counting mechanism for automatically determining the number of coins deposited in each carton or carrier.

4. In a coin counting and packaging machine, the combination with an automatically movable carrier having means for holding a plurality of cartons or packages, of feed mechanism for depositing coins in the cartons or packages on said carrier and counting mechanism operated by the coin for moving said feed mechanism into operative relation with the cartons on the carrier in succession, whereby a predetermined number of coins is deposited in each carton.

5. In a coin counting and packaging machine, the combination with an automatically movable carrier having means for holding a series of cartons or packages, of a coin chute for depositing the coins in the cartons or packages on said carrier, means for moving the chute successively into coöperation with the cartons or packages on the carrier and counting mechanism automatically operated by the coin controlling the operation of said means whereby a predetermined number of coins is deposited in each carton or package.

6. In a counting and packaging machine, the combination with an automatically movable carrier having a series of holders for

suitable cartons or packages, of an inclined coin chute for depositing coin into said cartons or packages, an inclined hopper, feed mechanism in said hopper for delivering the coins one at a time into the upper end of said chute, automatic means for moving said chute successively into coöperation with the cartons or packages on said carrier and counting mechanism controlled by the passage of each coin into the chute for determining the operation of said means, whereby a predetermined number of coins is deposited in each carton or package.

7. In a coin counting and packaging machine, the combination with a concentrically arranged shifting carrier having means for holding a series of cartons, of feed mechanism for depositing coins in said cartons, mechanism for moving said carrier to bring the cartons thereon successively into cooperative relation with said coin feeding mechanism, and counting devices controlled by the movement of the coin through said feed mechanism and adapted to determine the moment of operation and control the intermittent movement of said carrier shifting mechanism, whereby a predetermined number of coins is deposited in each carton.

8. In a coin counting and packaging machine, the combination with a carrier having means for holding a series of cartons, of an inclined coin chute for delivering the coins into the cartons on said carrier, an inclined hopper and feed mechanism for delivering the coins one at a time from the upper part of said hopper into said chute and counting mechanism controlled by the passage of coin through said chute for shifting said carrier to bring the cartons thereon successively into line with said chute.

9. In a coin counting and packaging machine, the combination with a shifting carrier having means for holding a series of cartons, of feed mechanism for delivering the coins into said cartons, means controlled by the movement of the coins through said feed mechanism for shifting said carton carrier step by step, and means controlled by the movement of said carrier for holding said feed mechanism in line with one of the cartons thereon and for shifting the same at a predetermined point into line with the next succeeding carton, whereby a predetermined number of coins is deposited in each carton.

10. In a coin counting and packaging machine, the combination with a carrier having means for holding a series of cartons of a chute for depositing the coins into the cartons on said carrier, feed mechanism for delivering the coins one at a time into said chute, mechanism controlled by the passage of coins through said chute for shifting said carrier step by step, and means controlled by said carrier for holding said chute in line with one of said cartons and for shifting the same at a predetermined point into line with the next carton.

11. In a coin counting and packaging machine, the combination with a carrier having holders for a series of cartons, of an inclined, swinging coin chute for depositing the coins in said cartons, a hopper and feed mechanism in said hopper for delivering coins one at a time into said chute, mechanism controlled by the passage of the coin through said chute for shifting said carrier step by step and means controlled by the movement of the carrier for holding said swinging chute in line with one of the cartons thereon and for shifting the same at a predetermined point into line with the next adjacent carton, whereby a predetermined number of coins is deposited in each of said cartons.

12. In a coin counting and packaging machine, the combination with a carrier having holders for supporting a series of cartons and having a series of pins corresponding to said carton holders, of an inclined swinging chute for depositing the coins into the cartons on said carrier, mechanism controlled by the passage of coins through said chute for shifting said carrier step by step and a swinging lever arranged to be engaged and shifted by the pins on said carrier, said lever being connected to said chute to hold the same in line with one of the cartons on the shifting carrier and to permit the shift of the chute into line with the next succeeding carton at a predetermined point.

13. In coin counting and packaging machines, the combination with a carrier having holders for a series of cartons, of feed mechanism for depositing the coins in said cartons, a motor for driving said carrier, an escapement operated by the movement of the coins through said feed mechanism for controlling the step by step movement of said carrier and means controlled by the movement of the carrier for holding the feed mechanism in line with one of the cartons thereon and for shifting the same at a predetermined point into line with the next adjacent carton, whereby a predetermined number of coins is deposited in each carton.

14. In a coin counting and packaging machine, the combination with a rotary carrier having holders for a series of cartons, of an inclined, spring-held, swinging chute for depositing the coins into said cartons, a hopper and feed mechanism therein for delivering the coins one at a time to said chute, an operating motor for said carrier, a step by step escapement operated by the movement of the coins through said chute for controlling the operation of said carrier, and a controlling lever connected to said chute, said carrier having a series of pins corresponding to the carton holders thereon for engaging and operating said lever to hold the chute in line

with one of the cartons and shift the same at a predetermined point into line with the next adjacent carton, whereby a predetermined number of coins is deposited in each carton.

15. In a coin counting and packaging machine, the combination with a coin chute, of a hopper having inclined side walls and an inclined rotary feed disk in the bottom of said hopper having devices on its edge for engaging single coins, said hopper having a ring forming a feed groove about the devices on the edge of said feed disk, and an opening in the upper bottom portion of said hopper through which the coins are delivered one at a time into said chute.

16. In a coin counting and packaging machine, the combination with an inclined coin chute, of a hopper having inclined side walls and an oppositely inclined feed disk in the bottom of the hopper having hinged plates on its edge arranged to engage single coins, said hopper having a ring at its bottom portion forming a feed groove over said hinged plates, and a supporting guide in the bottom of said hopper for normally holding said plates in line with the disk, said guide having an outwardly extending, grooved portion extending through an opening in the hopper to permit of a backward movement of said hinged plates to deposit the coins thereon into said chute.

17. In a coin counting and packaging machine, the combination with a feed chute for delivering the coins into suitable cartons, of a hopper, a feed disk in said hopper for delivering the coins one at a time into said chute, a motor geared to said hopper, a governor controlling the operation of said motor a starting and stopping lever a yielding, spring arm on the shaft of said governor engaged by said lever.

18. In a coin counting and packaging machine, the combination with a shiftable feed mechanism for depositing the coins into a series of cartons or packages, of counting mechanism for determining the number of coins deposited in each package, and adjustable means for automatically interrupting the discharge of coins at a predetermined point, during the transit of the feed mechanism from one package to the next succeeding package.

19. In a coin counting and packaging machine, the combination with a suitable carrier having means for supporting a series of cartons or packages, of motor driven feed mechanism for delivering the coins into the cartons or packages on said carrier, counting mechanism controlled by the movement of the coins through said feed mechanism for shifting the same at predetermined points successively into line with the cartons on said carrier and adjustable devices operated by said counting mechanism for arresting the operation of the machine at a predetermined point.

20. In a coin counting and packaging machine, the combination with a carrier having holders for a series of cartons, of a feed chute for delivering the coins into said cartons, counting mechanism controlled by the passage of the coins through the chute for shifting said carrier step by step, shifter mechanism controlled by the movement of said carrier for holding the chute in line with one of the cartons thereon and for shifting the same at a predetermined point into line with the next adjacent carton and adjustable stop mechanism operated by said chute shifting mechanism for arresting the passage of coins through the chute at a predetermined point.

21. In a coin counting and packaging machine, the combination with a carrier having holders for a series of cartons, of a feed chute for delivering the coins into said cartons, counting mechanism controlled by the passage of the coins through the chute for shifting said carrier step by step, shifter mechanism controlled by the movement of said carrier for holding the chute in line with one of the cartons thereon and for shifting the same at a predetermined point into line with the next adjacent carton, motor driven feed mechanism for delivering the coins one at a time to said chute and adjustable stop devices operated by said chute shifter mechanism for arresting the operation of said feed mechanism and for arresting the passage of coins through said chute.

22. In a coin counting and packaging machine, the combination with a carrier having means for holding a series of cartons, of a chute and feed mechanism for delivering the coins one at a time to said cartons, spring motor mechanism comprising a spring winding shaft controlled by the movement of the coins through the chute for shifting the carrier to bring the cartons thereon successively in line with said chute, adjustable stop devices for arresting the operation of the machine at a predetermined point and means controlled by the winding shaft of said spring motor for resetting said machine to permit its further operation.

23. In a coin counting and packaging machine, the combination with a carrier having holders for a series of cartons, a chute for delivering the coins to said cartons, feed mechanism for delivering the coins one at a time to said chute, an operative spring motor for said feed mechanism, a starting and stopping hand lever for said spring motor, a second spring motor for operating said carrier, counting mechanism controlled by the passage of coins through the chute for controlling the step by step movement of said carrier, means controlled by said carrier for holding said chute in line with one of the cartons there-

on and for shifting the same at a predetermined point into line with the next adjacent carton, adjustable stop devices operated by said chute shifting means for arresting the operation of the coin feeding mechanism, rewinding mechanism for the carrier motor arranged to reset said stop mechanism and means connected to said hand controlled lever for preventing the operation of said resetting mechanism until said lever is shifted to its stop position.

24. In a coin counting and packaging machine, the combination with a carrier having holders for a series of cartons, of a chute for depositing the coins in the cartons on said carrier, an escapement controlled by the passage of the coins through the chute, gears connecting said escapement to the carrier to control the step by step movement thereof, one of said gears being mutilated to permit a long step of said carrier at predetermined points, said carrier having a series of pins corresponding with the carton holders thereon and a controlling lever for said chute arranged to be successively engaged and released by said pins to hold said chute into line with one of the cartons on the carrier and at a predetermined point corresponding to the long step of the carrier to shift the chute into line with the next adjacent carton.

25. In a coin counting and packaging machine, a hopper the bottom of which consists of an inclined revoluble bottom or feed-disk, and wall therefor the lower portion of which is at an acute angle to the plane of said disk.

26. In a coin counting and packaging machine, a hopper comprising an inclined revoluble bottom or disk, and wall therefor the extent of the projection of which from the plane of the disk is greatest at its lowest part, and least at its upper part.

27. In a coin counting and packaging machine, a hopper the bottom of which consists of an inclined revoluble bottom or feed-disk, and wall therefor the extent of the projection of which from the plane of the disk is greatest at its lowest part, where it is disposed at an acute angle to said disk, and is least in projection at its uppermost part.

28. In a coin counting and packaging machine, a hopper comprising a revoluble disk, and wall therefor having an annular feed-way at its base, in which the marginal edge of said disk moves, and the overhang of some portion of which is nearer said edge than other portions thereof.

29. In a coin counting and packaging machine, a hopper comprising a revoluble disk, and wall therefor having an annular feed-way at its base, in which the marginal edge of said disk moves, the portion of said feed-way opposed to the downward moving part of said disk being practically closed, and the portion of said feed-way commencing with the lowermost segment thereof and extending upward therefrom in the direction of the movement of the disk being open.

30. In a coin counting and packaging machine, a hopper comprising a revoluble disk, and wall therefor having an annular feed-way at its base, in which the marginal edge of said disk moves, the portion of said feed-way opposed to the downward moving part of said disk being practically closed, and the portion of said feed-way extending in the direction of the upward movement of said disk being open, and gradually increasing the distance of its overhang from said disk from the lowest segment thereof to the highest.

31. In a coin counting and packaging machine, an inclined hopper comprising a revoluble bottom or disk having a sectional margin, each section of which is adapted to tilt backward in succession when passing through the uppermost segment of its movement.

32. In a coin counting and packaging machine, an inclined hopper comprising a revoluble bottom or disk having a sectional outer margin, the units of which are separately hinged to said disk, and means for supporting said units in the same plane as said disk except when passing through the uppermost segment of their movement.

33. In a coin counting and packaging machine, an inclined hopper comprising a revoluble bottom or disk having a sectional margin, the sectional units of which are adapted to tilt backward in succession when passing through the uppermost segment of their movement, and wall therefor the lower portion of which is at an acute angle to the plane of said disk.

34. In a coin counting and packaging machine, an inclined hopper, comprising a revoluble bottom or disk having a sectional outer margin, the units of which are separately hinged to said disk, means for supporting said units in the same plane as said disk except when passing through the uppermost segment of their movement, and wall therefor the lower portion of which is at an acute angle to the plane of said disk.

35. In a coin counting and packaging machine, an inclined hopper comprising a revoluble bottom or disk having a sectional margin, the sectional units of which are adapted to tilt backward in succession when passing through the uppermost segment of their movement, and wall therefor having an annular feed-way at its base in which the sectional margin of said disk moves, and the overhang of some portion of which is nearer the surface of said sectional margin than other portions thereof.

36. In a coin counting and packaging machine an inclined hopper comprising a revoluble bottom or disk having a sectional outer margin, the units of which are separately hinged to said disk, means for supporting

said units except when passing through the uppermost segment of their movement, and wall therefor having an annular feed-way at its base in which the sectional margin of said disk moves, and the overhang of some portion of which is nearer the surface of said sectional margin than other portions thereof.

37. In a coin counting and packaging machine, an inclined hopper comprising a revoluble bottom or disk having a sectional margin, the sectional units of which are adapted to tilt backward in succession when passing through the uppermost segment of their movement, and wall therefor having an annular feed-way, the portion of which conterminous with the upwardly moving part of said disk being open and gradually increasing the distance of its overhang from said disk commencing at the lowest segment thereof and extending to the highest, and the remaining portion of said feed-way being closed.

38. In a coin counting and packaging machine, an inclined hopper comprising a revoluble bottom or disk having a sectional outer margin, the units of which are separately hinged to said disk, means for supporting said units in the same plane as said disk except during the movement of said units except when passing through the uppermost segment of their movement, and wall having an annular feed-way the portion thereof extending upward in the direction of the movement of said disk being open and gradually increasing the distance of its overhang from said disk commencing with the lowest segment thereof and extending to the highest, and the remaining portion of said feed-way being closed.

CHARLES L. LILLEBERG.

Witnesses:
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LILLIAN PRENTICE.