June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 1

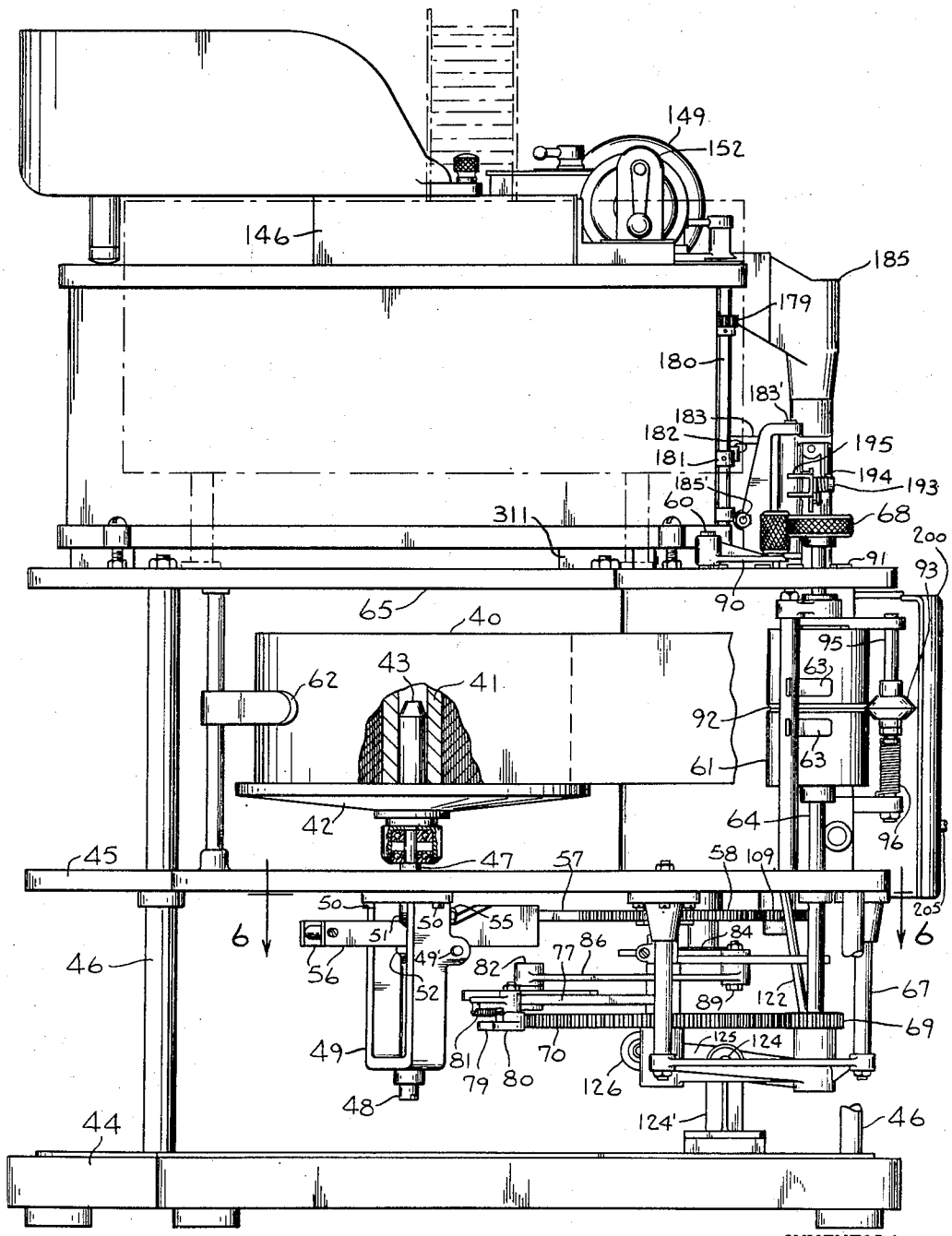


FIG. 1

INVENTORS
Julius Jorgensen

BY
Charles J. French

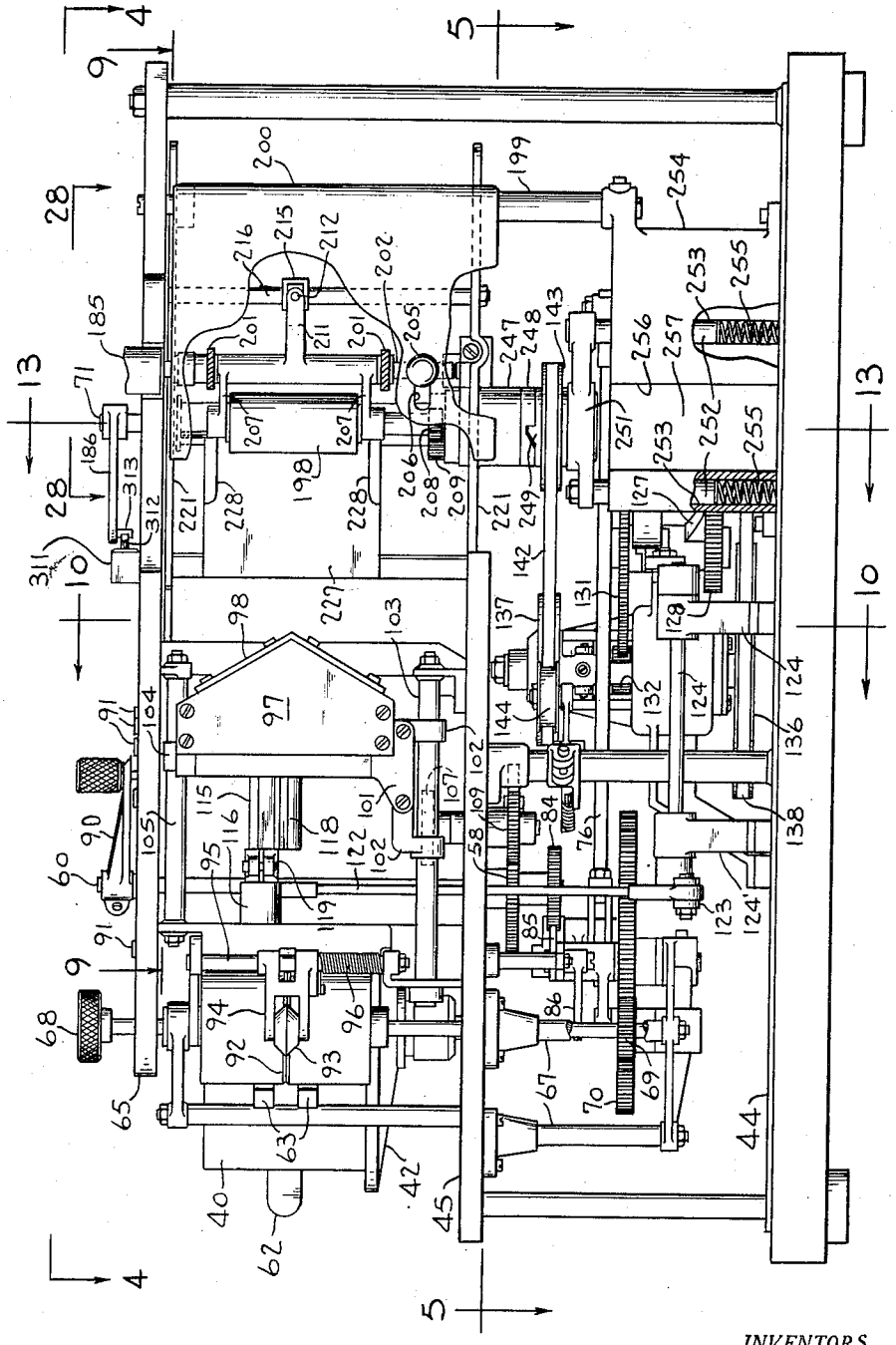
ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 2

FIG. 2



INVENTORS
Julius Jorgensen

BY
Charles F. Frenda

ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 3

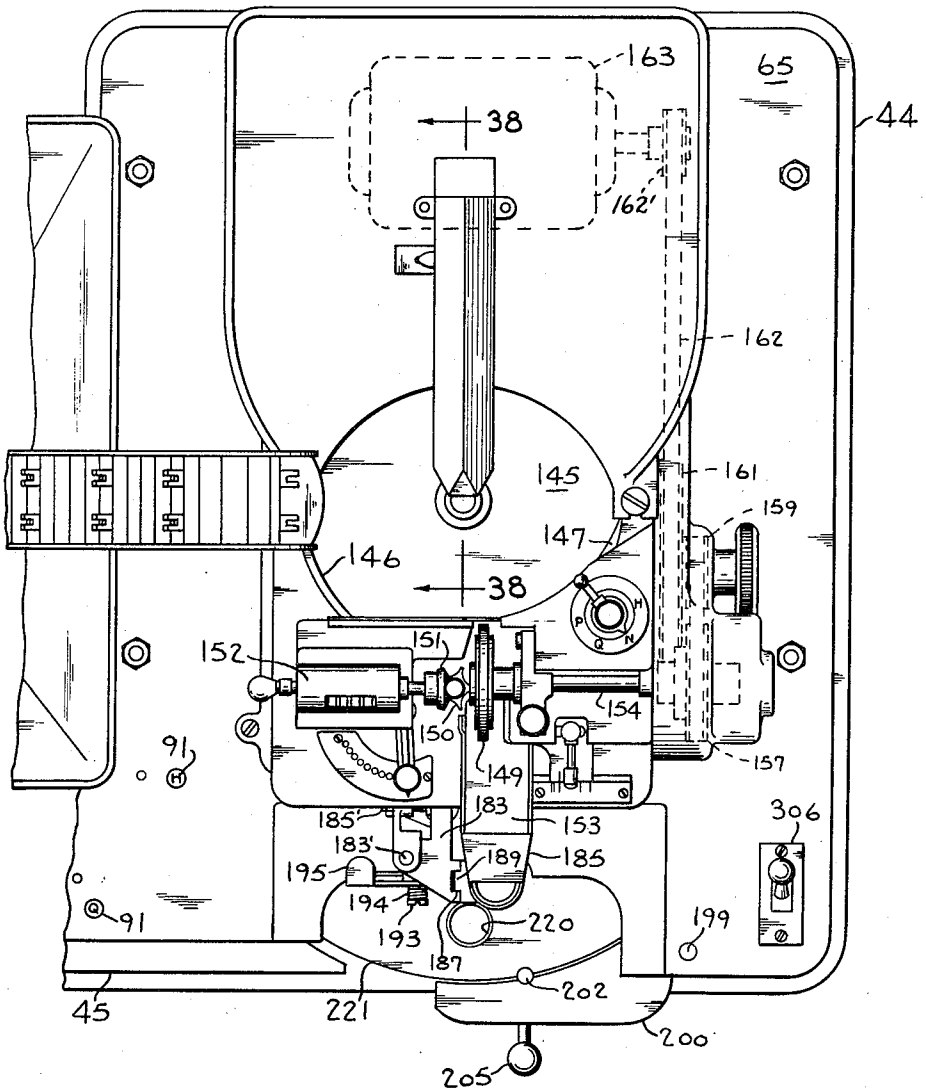


FIG. 3

INVENTORS
Julius Jorgensen
BY Charles J. French

ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 4

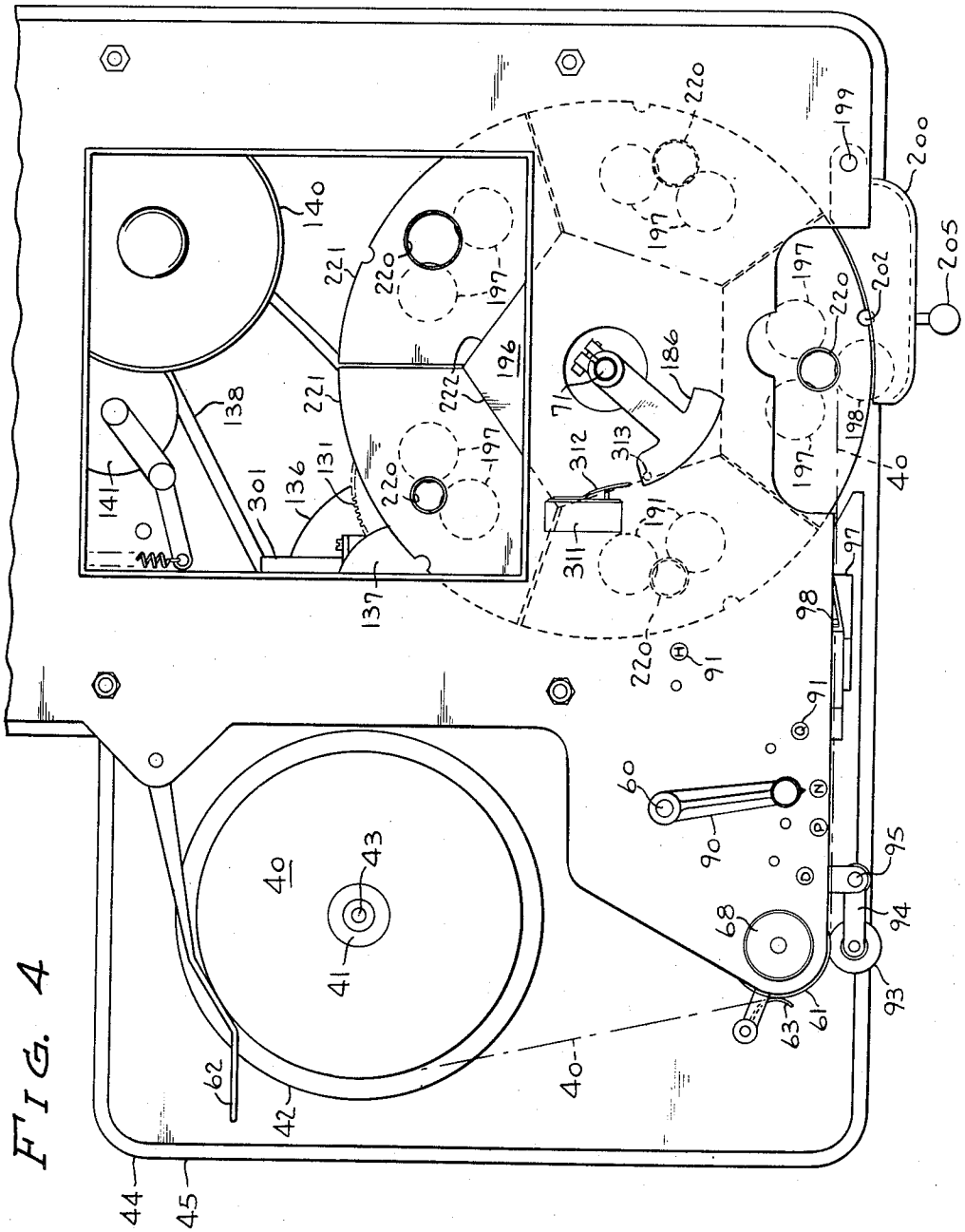


FIG. 4

INVENTORS
Julius Jorgensen
BY Charles J. French
ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 5

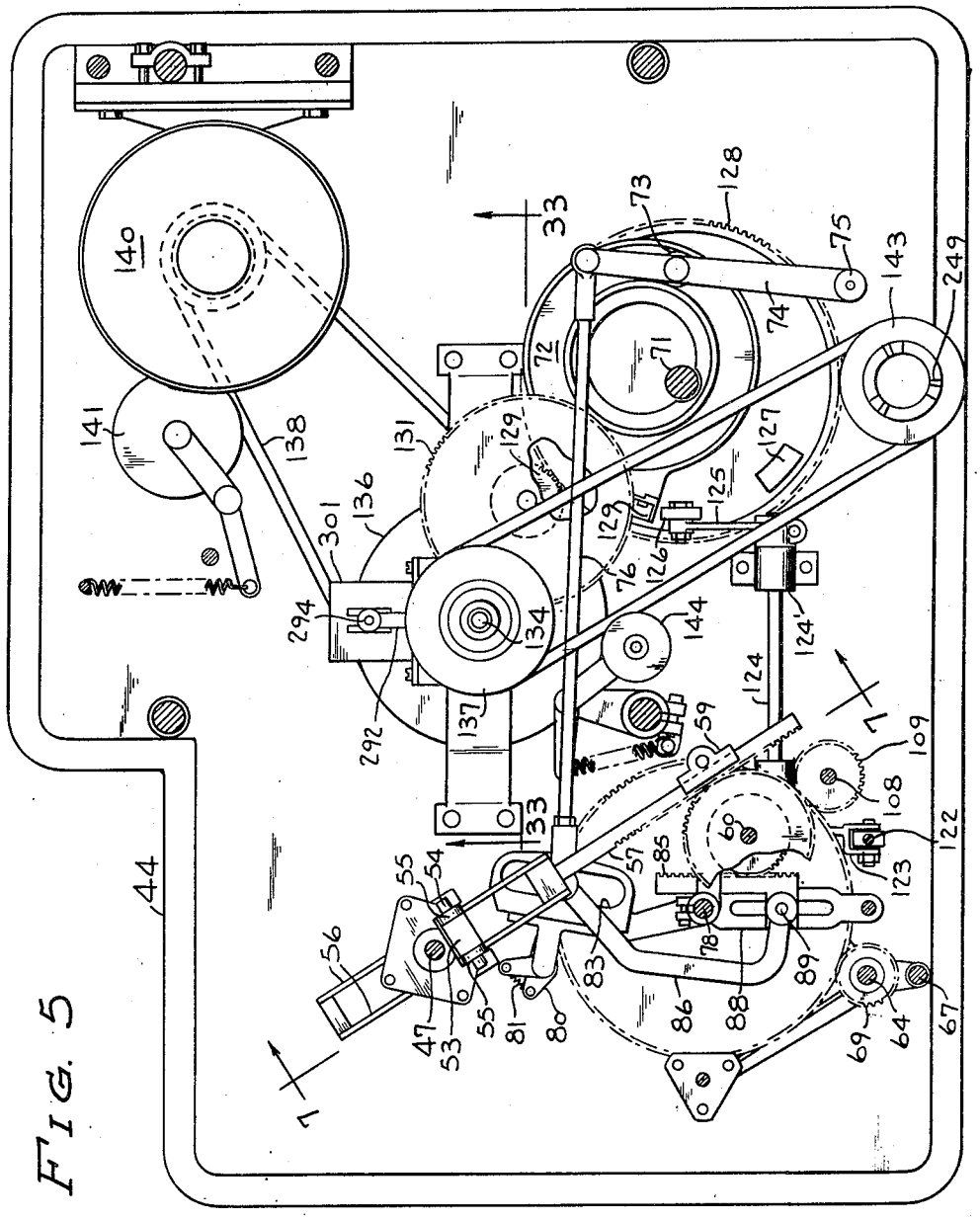


FIG. 5

INVENTORS
Julius Jorgensen

BY

Charles F. French

ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 6

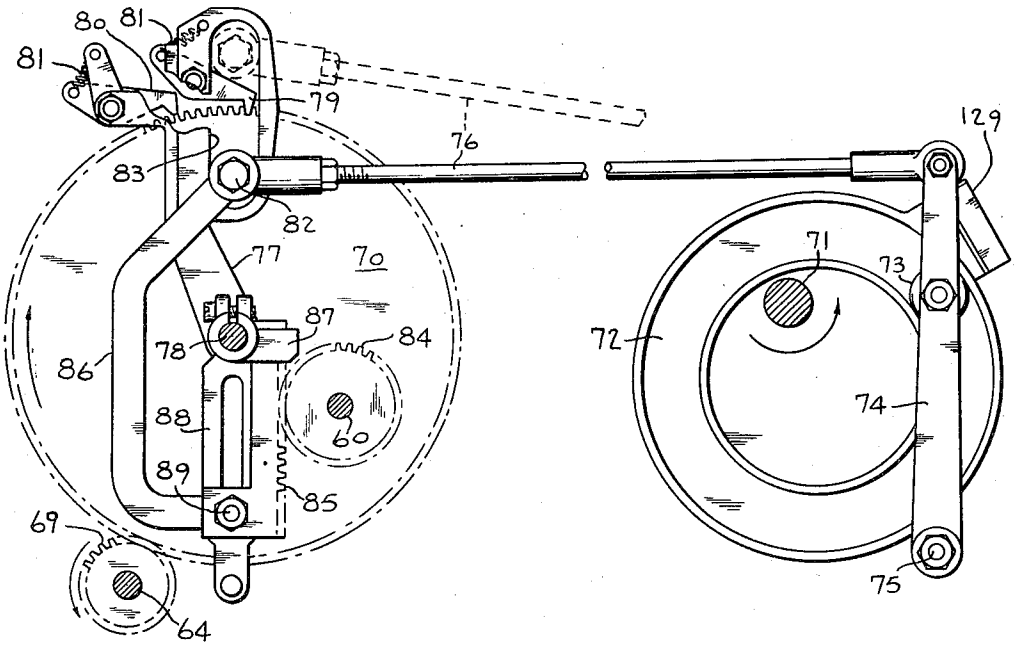


FIG. 6

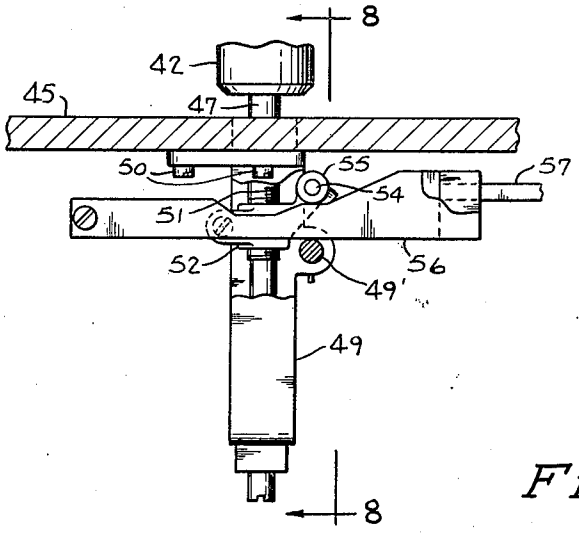


FIG. 7

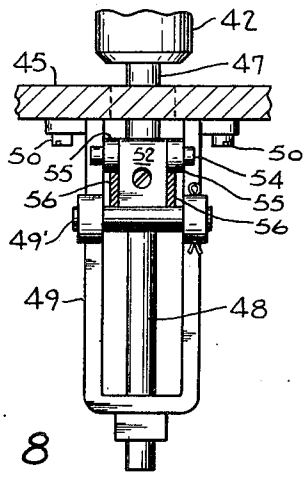


FIG. 8

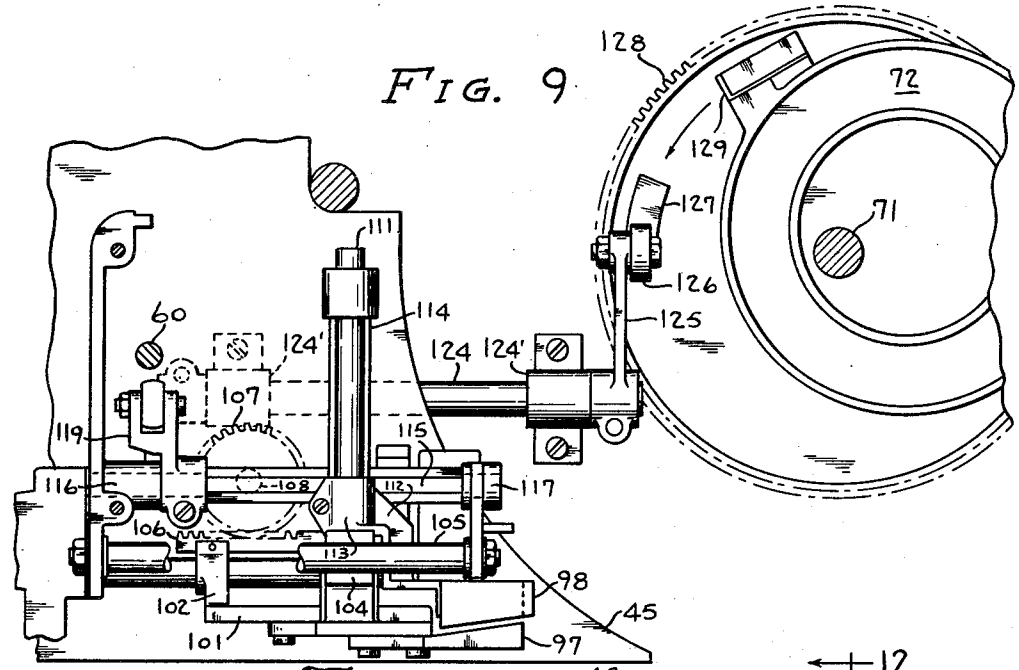
INVENTORS
Julius Jorgensen
BY
Charles & French
ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 7

FIG. 9



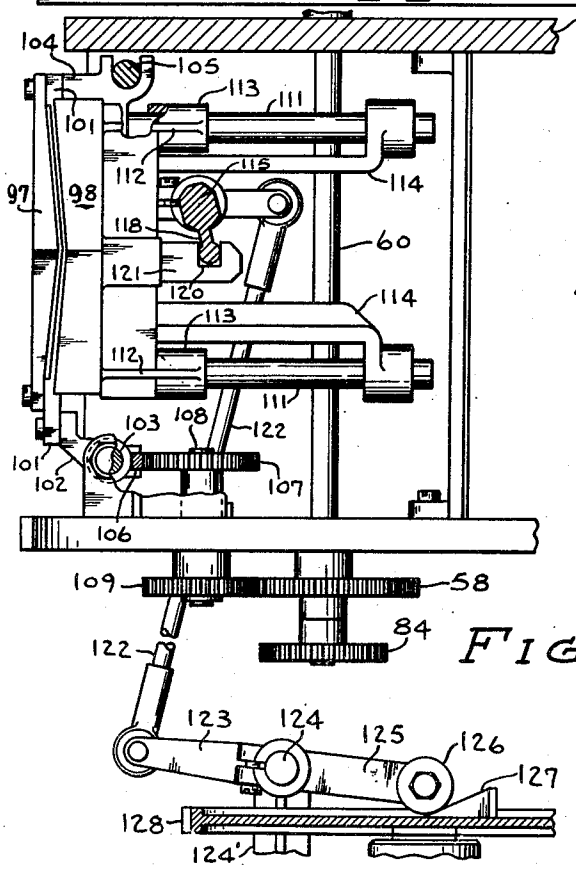


FIG. 10

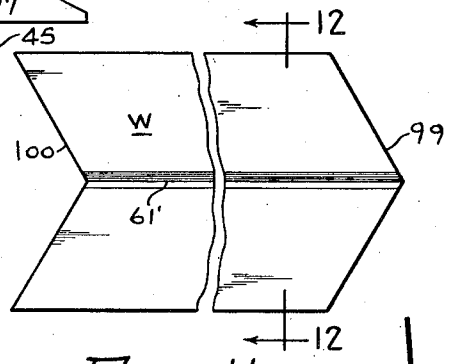


FIG. 11

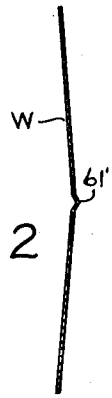


FIG. 12

INVENTORS
Julius Jorgensen

BY Charles & French

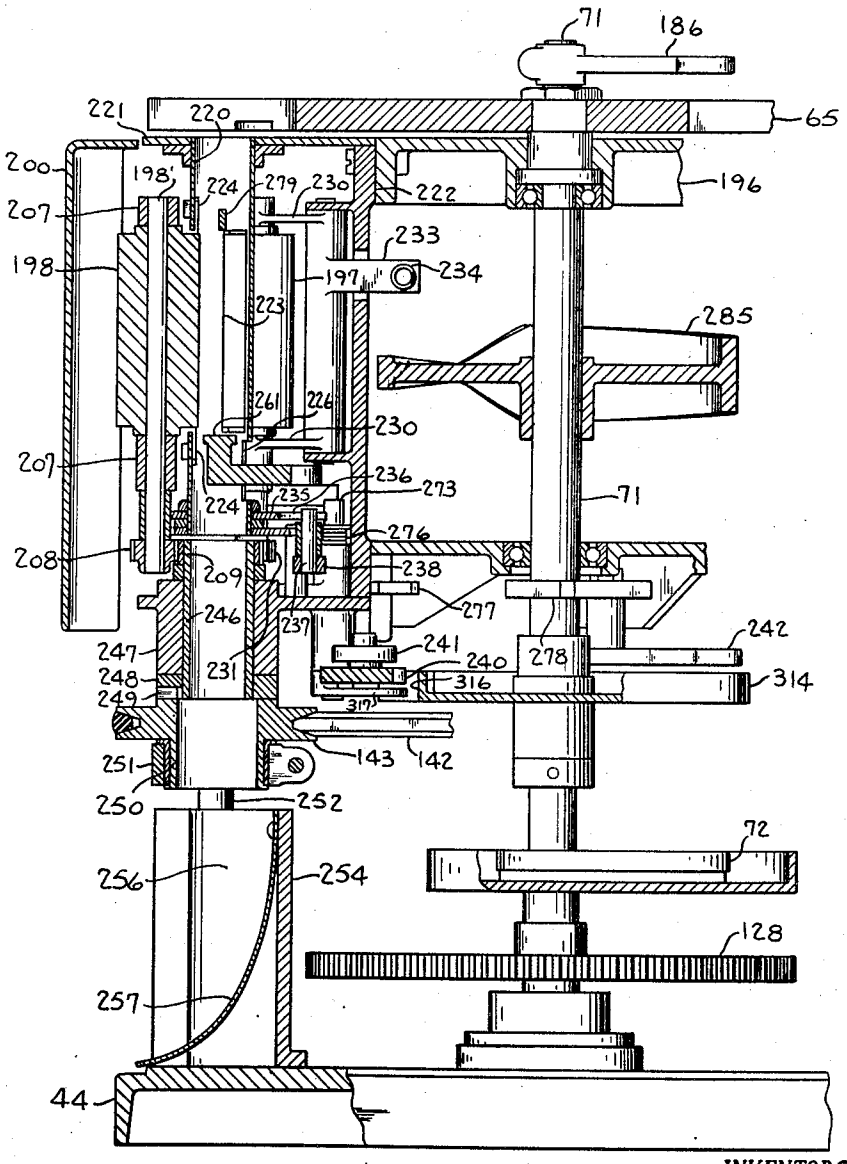
ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 8

FIG. 13



INVENTORS

Julius Jorgensen

BY

Charles J. Francis

ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 9

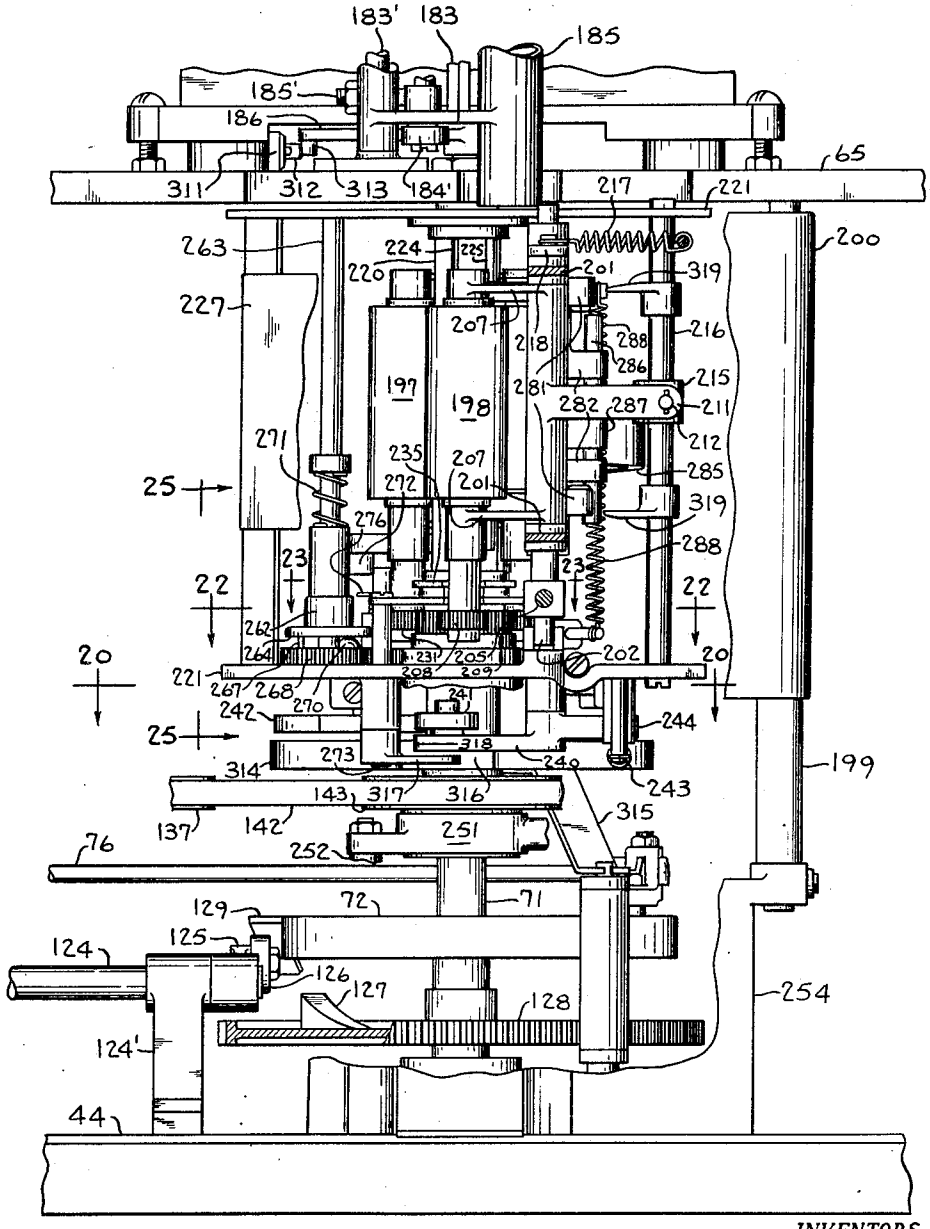


FIG. 14

INVENTORS
Julius Jorgensen
BY
Charles & French
ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 10

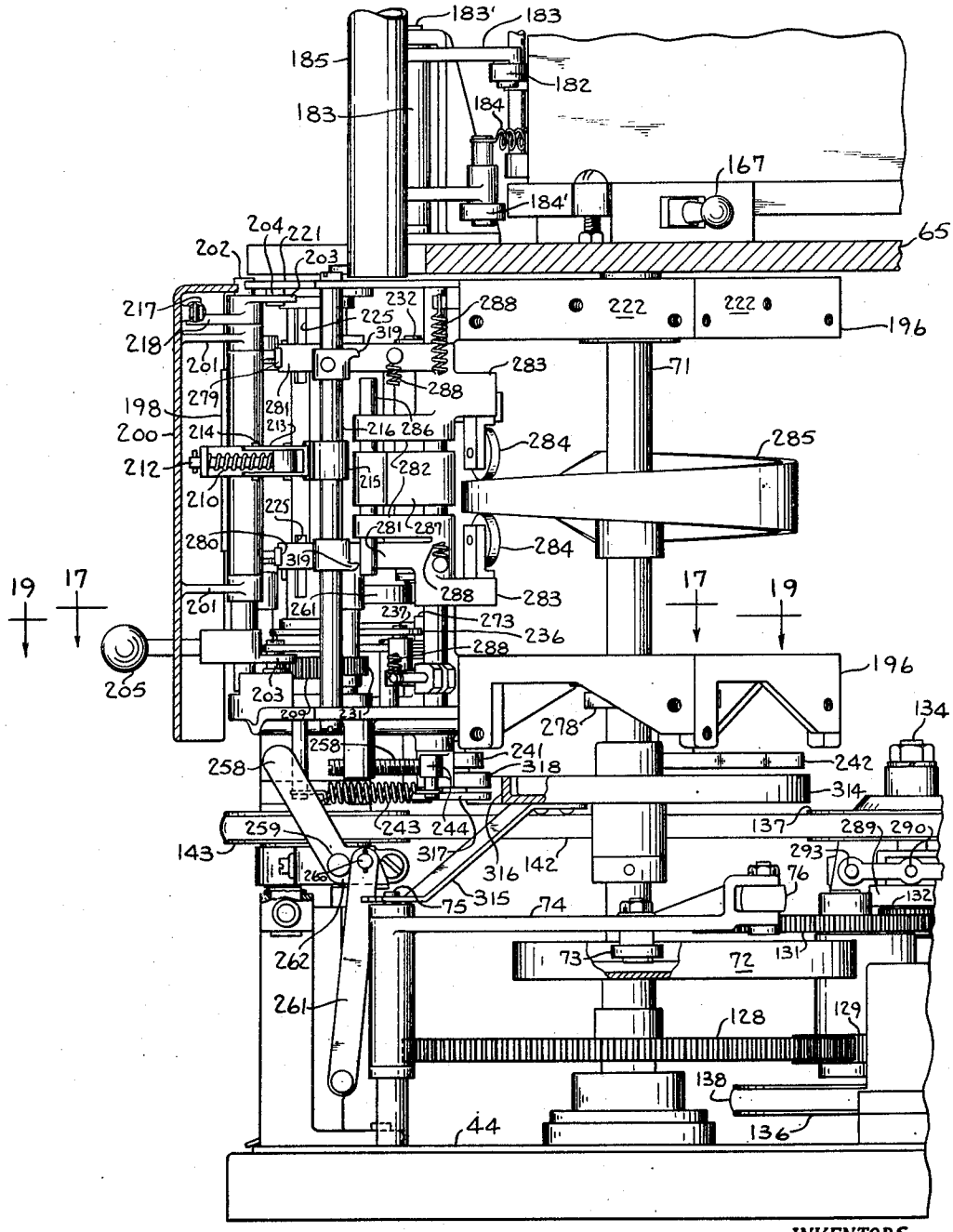


FIG. 15

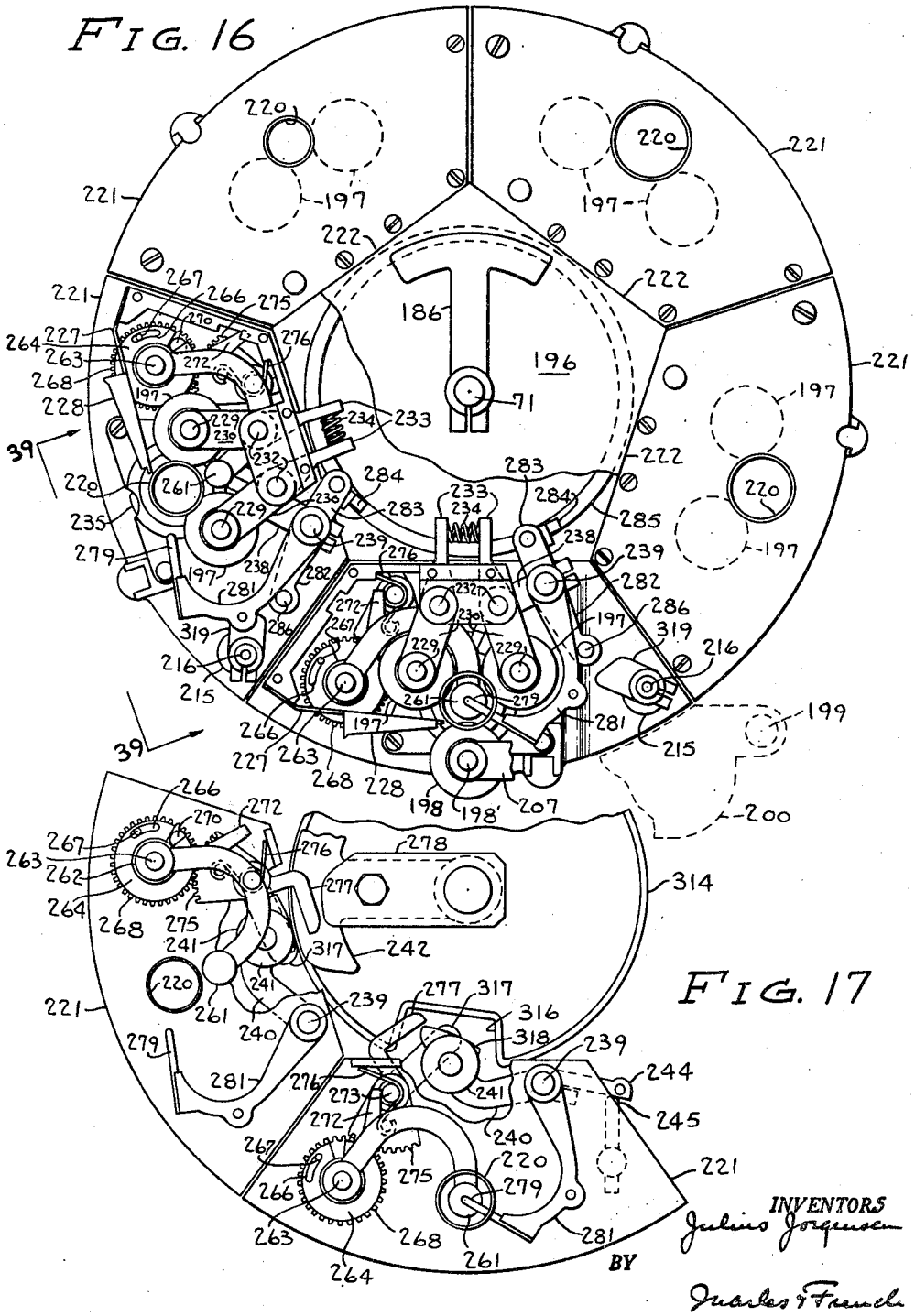
INVENTORS
Julius Jorgensen
BY
Charles O'French
ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 11

FIG. 16



INVENTORS
Julius Jorgensen

BY
Charles F. French

ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 12

FIG. 28

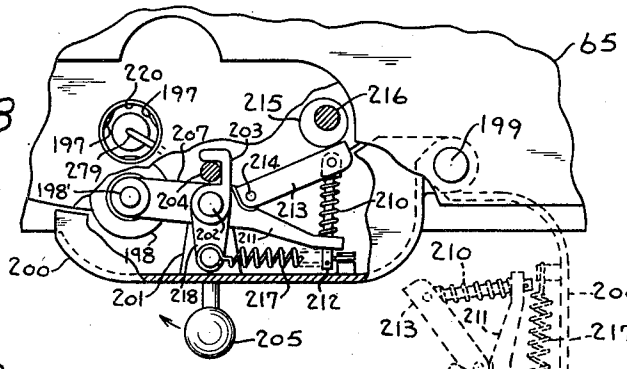
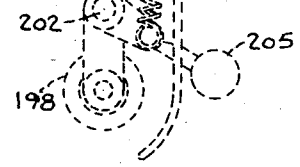
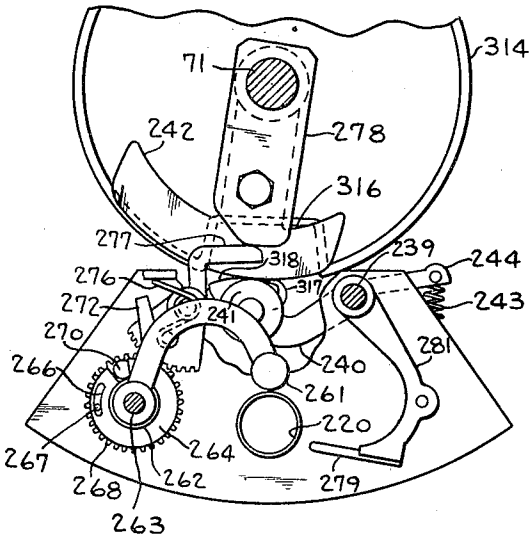


FIG. 18





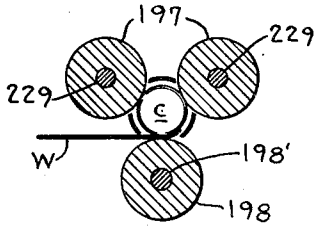


FIG. 21

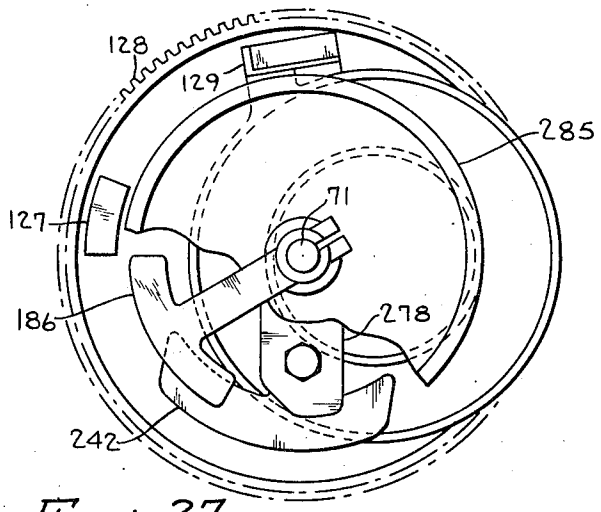


FIG. 27

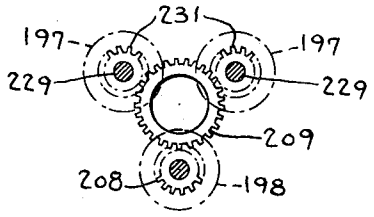


FIG. 22

INVENTORS
Julius Jorgensen
BY
Charles G. French
ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 13

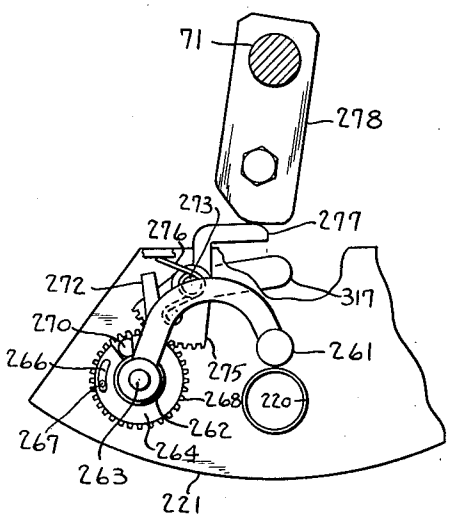


FIG. 19

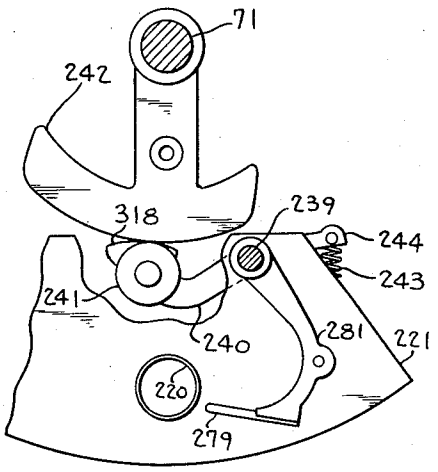


FIG. 20

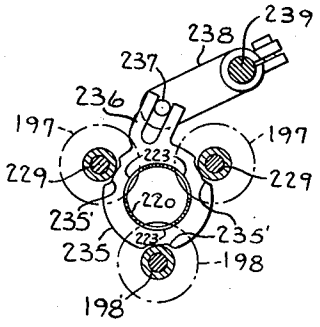


FIG. 23

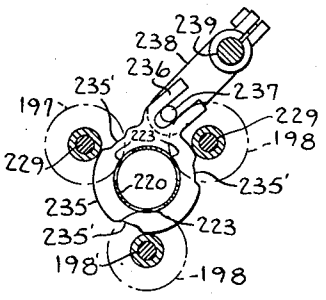


FIG. 24

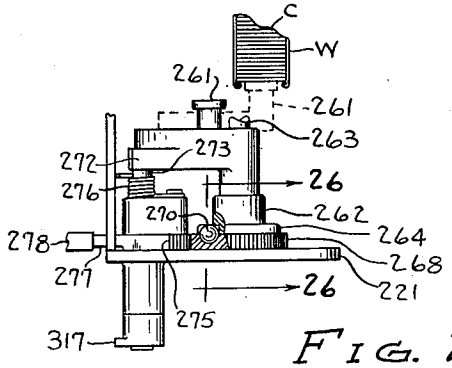


FIG. 25

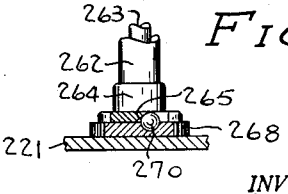


FIG. 26

INVENTORS
Julius Jorgensen
BY
Charles & Francis
ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 14

FIG. 29

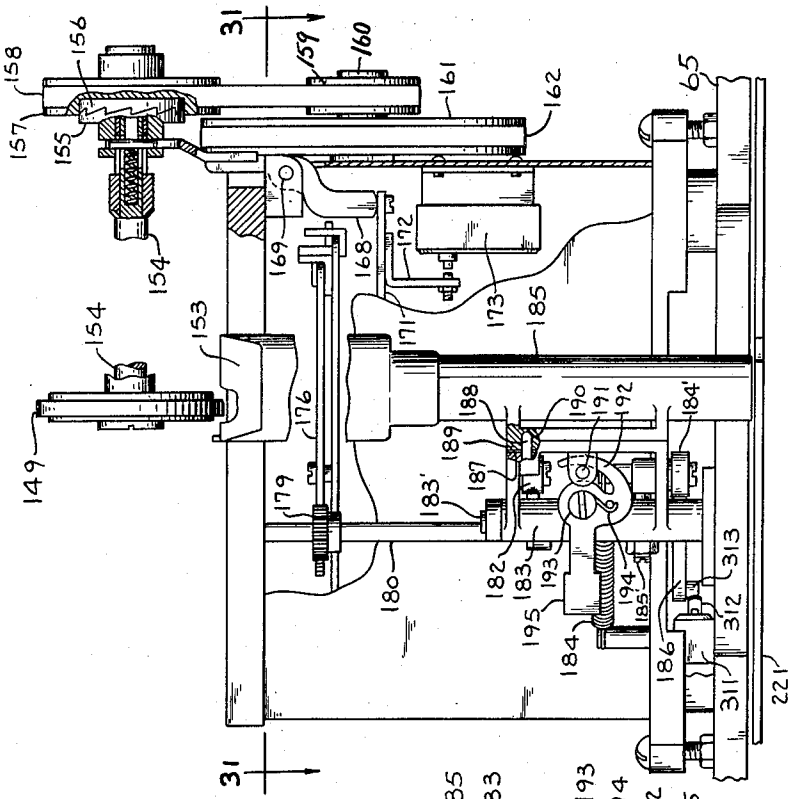
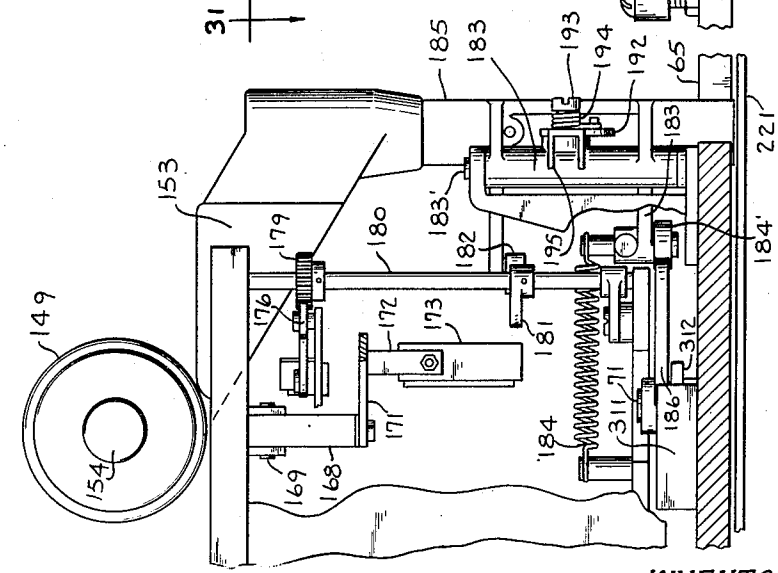


FIG. 30



INVENTORS
Julius Jorgensen

BY
Charles French

ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 15

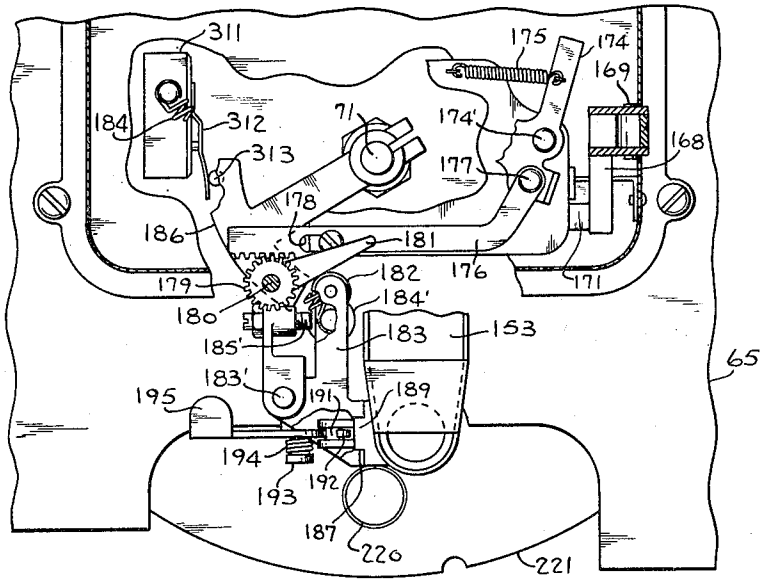


FIG. 31

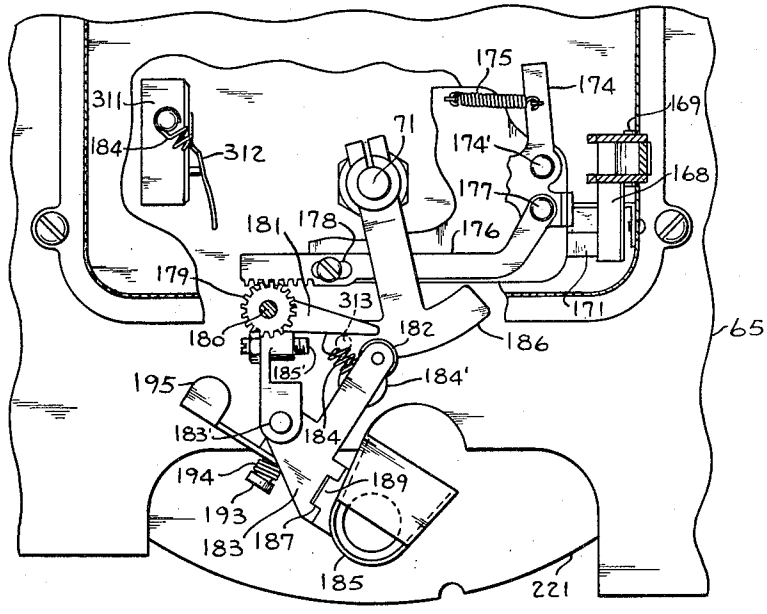


FIG. 32

INVENTORS
Julius Jorgensen

BY Charles F. French

ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 16

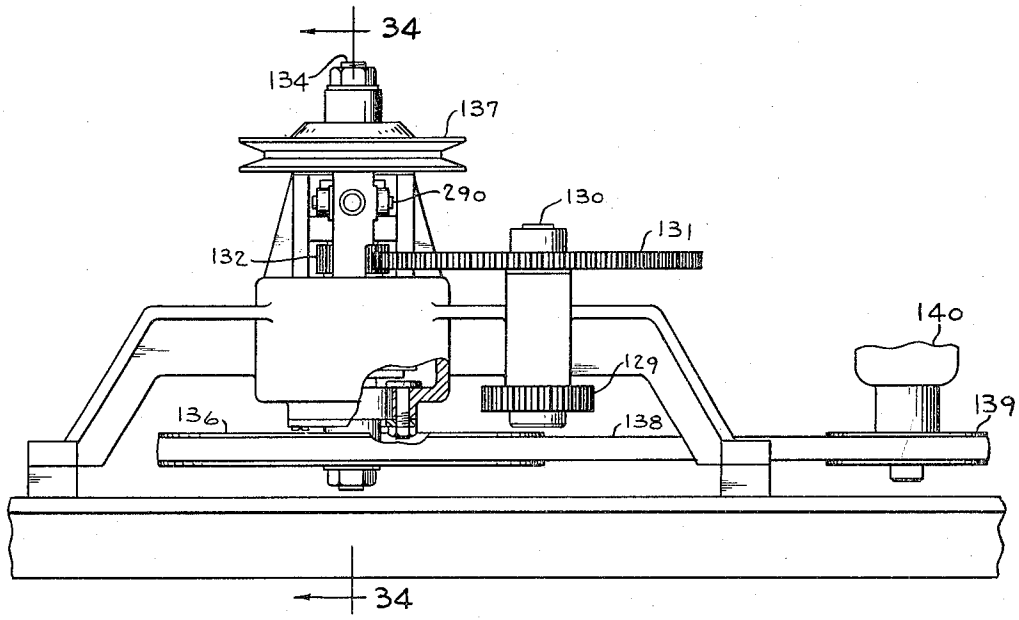


FIG. 33

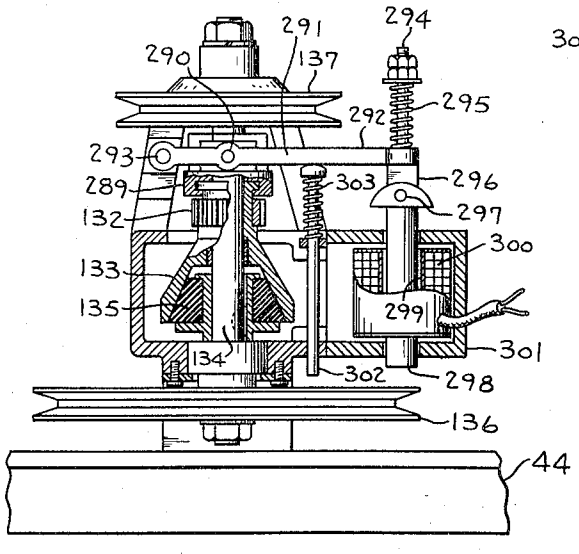


FIG. 34

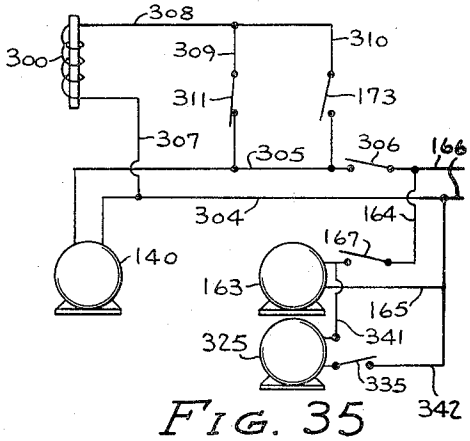


FIG. 35

INVENTORS
Julius Jorgensen

BY Charles J. French

ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 17

FIG. 36

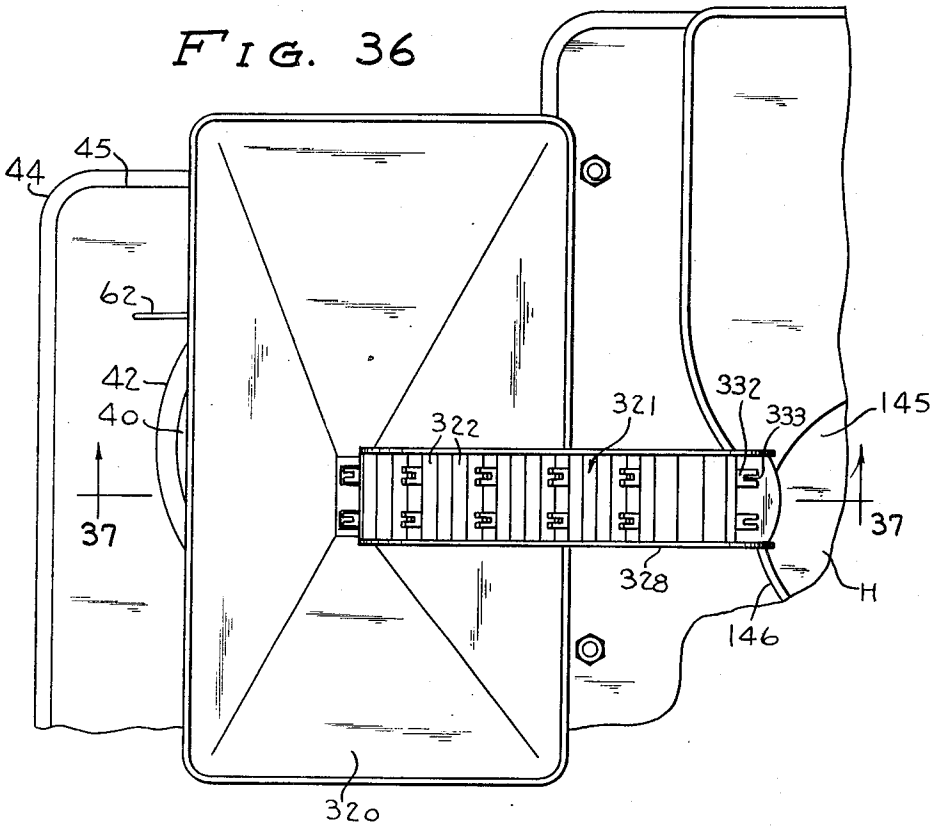
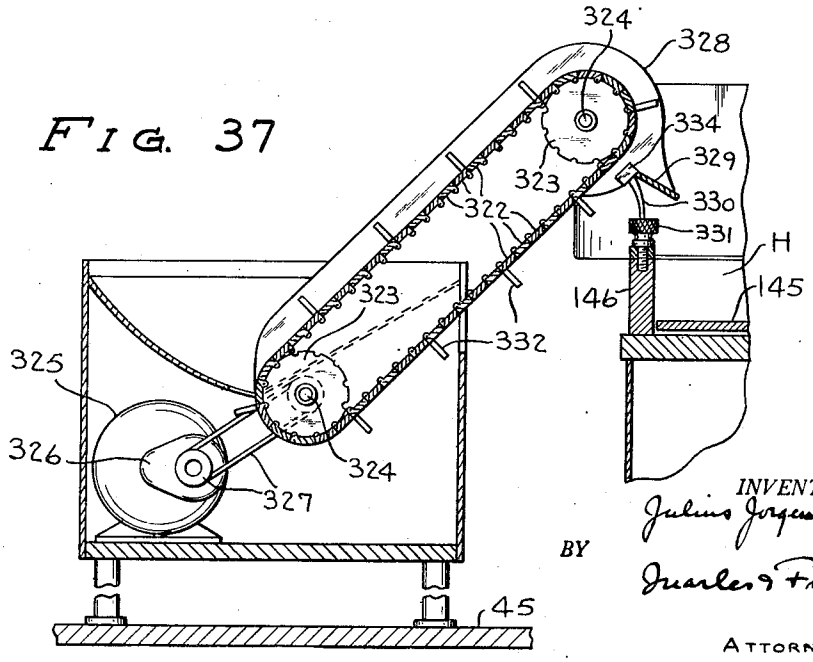


FIG. 37



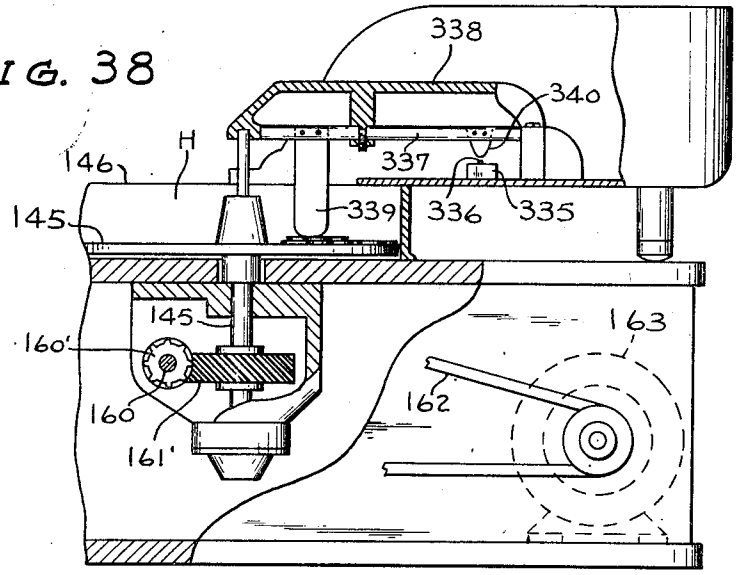
INVENTORS
Julius Jorgensen
BY
Charles G. French
ATTORNEYS

June 7, 1955 J. JORGENSEN 2,709,880

COIN HANDLING APPARATUS

Filed Dec. 10, 1948 18 Sheets-Sheet 18

FIG. 38



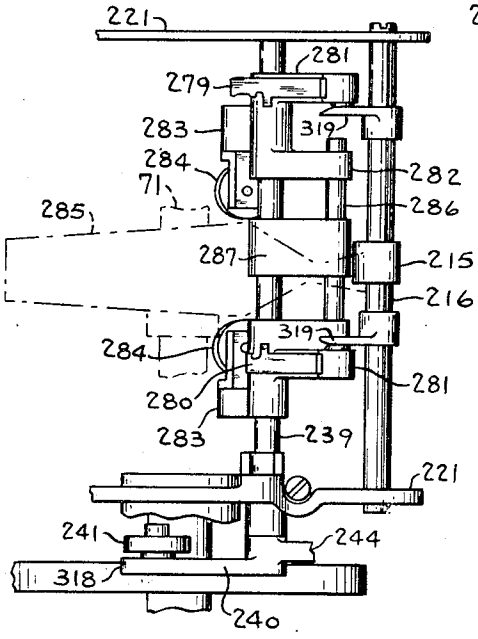


FIG. 39

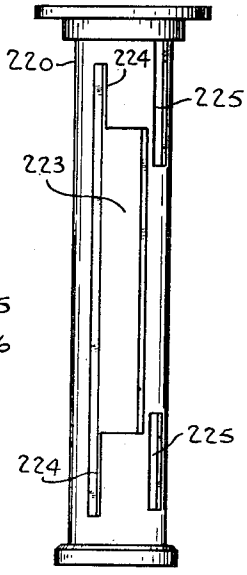


FIG. 40

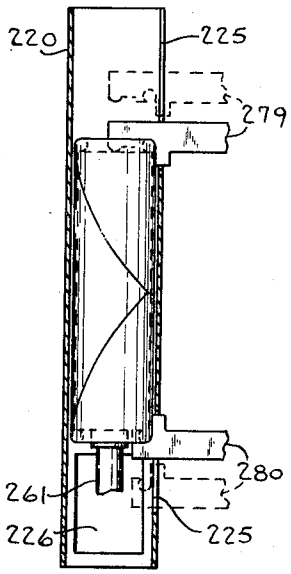


FIG. 41

INVENTORS
Julius Jorgensen

BY Charles & French

ATTORNEYS

United States Patent Office 2,709,880 Patented June 7, 1955

2,709,880

COIN HANDLING APPARATUS

Julius Jorgensen, Detroit, Mich., assignor to Brandt Automatic Cashier Company, Watertown, Wis., a corporation of Wisconsin

Application December 10, 1948, Serial No. 64,574

12 Claims. (Cl. 53—31)

The invention relates to coin handling apparatus.

One object of the invention is to provide a coin handling apparatus by which coins of any given denomination are deposited in a storage hopper, automatically fed therefrom to a coin counting machine in accordance with its requirements, automatically counted and in predetermined numbers delivered to a coin packaging apparatus preferably controlled by said counting machine and packaged thereby in wrappers automatically cut and formed from a roll of paper by mechanism controlled by said counting machine. Thus all the operator has to do is to supply the paper in roll form, deposit the coins in the storage hopper and start the apparatus in motion.

A further object of the invention is to provide a coin handling apparatus in which coins of different denominations may be expeditiously handled and in this connection to provide a coin packaging mechanism for each coin denomination movable into operative association with a single coin counting mechanism and to provide wrapper forming mechanism adjustable to provide wrappers in sizes appropriate for the different denominations.

The invention further consists in the several features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings:

Fig. 1 is a side elevation view of coin handling apparatus embodying the invention, parts being broken away and parts being shown in section and the feeder being shown in dotted lines;

Fig. 2 is a front elevation view of the apparatus shown in Fig. 1, with the counter omitted, parts being broken away and parts being shown in section;

Fig. 3 is a plan view of a portion of the apparatus shown in Fig. 1;

Fig. 4 is a horizontal sectional view taken on the line 4—4 of Fig. 2;

Fig. 5 is a horizontal sectional view taken on the line 5—5 of Fig. 2;

Fig. 6 is a detailed horizontal sectional view taken on the line 6—6 of Fig. 1;

Fig. 7 is a detailed vertical sectional view taken on the line 7—7 of Fig. 5;

Fig. 8 is a detailed vertical sectional view taken on the line 8—8 of Fig. 7;

Fig. 9 is a horizontal sectional view taken on the line 9—9 of Fig. 2;

Fig. 10 is a detailed vertical sectional view taken on the line 10—10 of Fig. 2, parts being shown in section;

Fig. 11 is a plan view of a wrapper, parts being broken away;

Fig. 12 is a detailed vertical sectional view taken on the line 12—12 of Fig. 11;

Fig. 13 is a detailed vertical sectional view taken on the line 13—13 of Fig. 2;

Fig. 14 is an enlarged front elevation view of the packaging mechanism, parts being broken away and parts being shown in section;

Fig. 15 is a side elevation view of one of the packaging units;

Fig. 16 is a plan view of the packaging units, the top plates of two of the units being removed;

Fig. 17 is a horizontal sectional view taken on the line 17—17 of Fig. 15 parts being broken away;

Fig. 18 is a detailed view, similar to Fig. 17, showing the parts in position for changing over to another denomination of coin;

Fig. 19 is a detailed horizontal sectional view taken on the line 19—19 of Fig. 15;

Fig. 20 is a detailed horizontal sectional view taken on the line 20—20 of Fig. 14;

Fig. 21 is a detailed vertical sectional view through the rollers of an operating packager;

Fig. 22 is a detailed horizontal sectional view taken on the line 22—22 of Fig. 14;

Figs. 23 and 24 are detailed horizontal sectional views taken on the line 23—23 of Fig. 14 showing the parts in different positions;

Fig. 25 is a detailed vertical sectional view taken on the line 25—25 of Fig. 14;

Fig. 26 is a detailed vertical sectional view taken on the line 26—26 of Fig. 25;

Fig. 27 is a plan view of the central shaft showing the relative position of the different cams;

Fig. 28 is a horizontal sectional view taken on the line 28—28 of Fig. 2;

Fig. 29 is a front elevation view of a portion of the counter, parts being broken away and parts being shown in section;

Fig. 30 is a side elevation view of a part of the counter, parts being broken away and parts being shown in section;

Fig. 31 is a detailed horizontal sectional view taken on the line 31—31 of Fig. 29, parts being broken away;

Fig. 32 is a view similar to Fig. 31 showing the parts in a different position;

Fig. 33 is a detailed front elevation view of a portion of the driving mechanism taken along the line 33—33 of Fig. 5;

Fig. 34 is a detailed vertical sectional view taken on the line 34—34 of Fig. 33;

Fig. 35 is a wiring diagram;

Fig. 36 is a plan view of the feeder, other parts being broken away;

Fig. 37 is a detailed vertical sectional view taken on the line 37—37 of Fig. 36;

Fig. 38 is a detailed vertical sectional view taken on the line 38—38 of Fig. 3;

Fig. 39 is a plan view of portions of the mechanism as viewed along the line 39—39 of Fig. 16;

Fig. 40 is aside view of the coin and wrapper receiving tube;

Fig. 41 is a vertical sectional view through the coin and wrapper receiving tube, showing the crimpers operating on the wrapper.

This apparatus includes wrapper blank forming mechanism, packaging mechanism, coin counter mechanism, means for selectively feeding coins from said coin counter to the packaging mechanism, and means for automatically feeding coins to said coin counter.

The wrapper blank forming mechanism

The paper 40 for the different denominations of coins is wound in rolls on hollow spools 41, any one of which is adapted to be centered on a rotatable support 42 by inserting the upstanding pin 43 thereof in the hollow of said spool, see Fig. 1. The width of the paper strip or web determines the length of the package and because these widths vary with the different denominations of coins means are provided for vertically adjust-

ing the support 42 so that the center of any one of the strips will be aligned with the center of the feed roller and the vertically disposed packaging rollers hereinafter referred to.

The means for vertically adjusting the support 42 and consequently the roll of paper mounted thereon is shown in Figs. 1, 5, 7, and 8. Referring to these figures, the apparatus includes a base plate 44, and a horizontally disposed shelf plate 45 supported from said base plate by uprights 46. The support 42 includes a centrally disposed pivot shaft 47 suitably journalled in the plate 45 and bearing at its lower end on a vertically adjustable shaft 48 which is loosely slidably mounted at its lower end in the transverse portion of a yoke 49 whose legs are secured by screws 50 to the bottom of the plate 45. The shaft 48 has a threaded portion 51 mounted in a threaded collar 52 having an arm 53 carrying a pin 54 on which rollers 55 are mounted in spaced relation. An initial vertical adjustment between the shafts 47 and 48 can be made by turning the shaft 48 from its lower slotted end in the collar 52. The rollers 55 bear upon spaced wedge-shaped bars 56 suitably connected together at their ends to form a wedge member slidably mounted on a pin 49', carried by the yoke 49, and connected at one end to a rack bar 57 which is slidably mounted and guided and held in operative relation to a rotatably adjustable gear 58, Fig. 5, by a member 59 suitably anchored to the shelf 45. Tuning of the gear 58 by turning of a control shaft 60 on which it is mounted moves the rack bar 57 and consequently the wedge bars 56 move the shaft 48 and consequently the shaft 47 up or down to adjust the vertical position of the support 42 relative to the shelf 45 so as to bring the center of the paper web into alignment with the center of a feed roll 61, Figs. 1, 4 and 5, from which the paper is fed to the wrapper cutting mechanism. An oscillatory resilient ended brake member 62 bears on the web, as shown in Figs. 1 and 4, and resilient brake shoes 63 bear on the paper web as it passes over the feed roll 61. The feed roll 61 is mounted on a vertically disposed shaft 64 journalled in the shelf 45 and an upper shelf 65 and in a bottom bearing member 66 supported from the shelf 45 by frame members 67 and carrying a hand wheel or adjusting knob 68 and a gear 69 meshing with a large gear 70, Figs. 1, 5 and 6.

As the length of the wrappers varies with the size or denomination of coins to be wrapped, the feed wheel 61 is given a variable feed, to vary the length of the wrapper, by variable stroke mechanism associated with the large gear 70. Referring to Figs. 5 and 6, the numeral 71 designates a main drive shaft for the wrapper forming mechanism and also the packaging mechanism upon which a grooved cam or eccentric 72 is mounted and within which cam a roller 73, intermediately carried by an oscillatory lever 74, runs whereby rotation of said eccentric oscillates said lever. Lever 74 is pivotally mounted at 75 on the frame of the machine and at its outer end is operatively connected by a link 76 to a slotted lever 77 freely pivotally mounted on a support shaft 78 for the gear 70. The outer end of lever 77 has a pair of feed pawls 79 and 80 pivotally mounted thereon and urged by springs 81 in engagement with the teeth of the gear 70 so that as the lever 77 is swung toward the right as viewed in Fig. 6, the gear 70 will be given a clockwise rotary movement, the extent of which is controlled by the adjustment of the roller end 82 of the link 76 working in the slot 83 of lever 77. For accomplishing this adjustment a gear 84 on the control shaft 60 meshes with a rack 85 operatively connected by a link 86 with the end 82 of link 76, said rack being guided by a fixed guide bracket 87 and a slotted fixed guide bar 88 in which the pivot shaft or bolt 89 connecting the rack 85 with the link 86 works. Thus by shifting the end 82 of the link 76 farther away from the center of the gear 70 or shaft 78 a longer stroke of

the pawls 79 and 80 will be obtained and hence a greater length of the web will be fed by the feed roll 61 from the roll of paper on the spool 41.

Since the stroke adjusting gear 84 and the vertical positioning adjustment gear 58 are both mounted on the control shaft 60, turning of this shaft by a crank arm 90, see Fig. 4, determines both adjustments, said crank arm carrying a pointer cooperating with index buttons 91 designated by the letters D, P, N, Q and H standing for dimes, pennies, nickles, quarters and half dollars, respectively, see Figs. 1, 2, and 4.

The paper web as it passes the feeding roll 61 is preferably creased along a center line so as to form a stiffening rib 61' in it and for this purpose the roll 61 is provided with a centrally disposed annular triangular groove 92 with which a conically formed creasing wheel 93 cooperates, said wheel being rotatably mounted on a swinging arm 94 mounted on a vertical shaft 95 and urged toward the wheel 61 by a torsion spring 96, see Figs. 1, 2, and 4.

The creased web is advanced by the feed roll 61 past the cutting mechanism by the amount of feed suited to the coins to be wrapped to cut the web into a wrapper blank W, as shown in Figs. 11 and 12. The cutting mechanism is shown in Figs. 2, 9, and 10 and includes a V-shaped knife 97 cooperating with V-notched knife plate or die 98 to cut the web into wrappers W, each having a pointed front end 99 and a notched rear end 100. The cutters 97 and 98 are mounted for lengthwise adjustment on fixed supports so as to position them to cut the web to a length determined by the setting of the amount of feed of the feed wheel 61. The knife 97 is mounted on a frame 101 which includes spaced lower tubular bracket members 102 slidably mounted on a fixed horizontally disposed lower guide bar 103 and a grooved bracket member 104 slidably mounted on a fixed horizontally disposed upper guide bar 105. A rack 106 is secured to the bracket members 102 and meshes with a gear 107 on a vertically disposed shaft 108 journalled in bearings in the plate 45 and carrying a gear 109 meshing with the gear 58 mounted on the control shaft 60, the ratio of the above gearing being such that the knives are moved lengthwise proportionately to the lengthwise feed of the paper web so that this web will be cut into blanks whose lengths are equal to the feed of the web by the feeding roll 61.

For reciprocating the knives or cutters 97 and 98 relative to each other the frame 101 carries vertically spaced horizontally disposed arms 114 secured at one end directly thereto, see Figs. 9 and 10. The knife or die 98 has spaced arms 112 provided with collars or bosses 113 fixed to the rods 111 which slide in the bearing arms 114 and the frame 101. An oscillatory shaft 115 journalled in fixed bearings 116 and 117 and of the polygonal form shown in cross section in Fig. 10 between said bearings and providing a lengthwise extending crank arm 118 has an operating crank arm 119 secured to it at one end. The arm 118 is slidably movable in a slot 120 in a part 121 projecting from the knife 98 so that said arm is effective for reciprocating said knife in any position of its lengthwise adjustment. The crank arm 119 is intermittently operated in synchronism with the web feed mechanism by a link 122 operatively connecting it with a crank arm 123 on a shaft 124 journalled in bearings 124' and carrying a cam operated crank arm 125 provided with a roller 126. Roller 126 is engaged by a cam projection 127 on a gear 128 fixed to the shaft 71 as said gear revolves in the direction of the arrow shown in Fig. 9 to raise said arm 125 and oscillate said shaft 124 and lower the arm 123 which through the link 122 swings the arm 119 in a clockwise direction and causes the crank 118 to act on part 121 of the knife 98 to push it outwardly toward the left, as shown in Fig. 10, so that the web of paper between the cutters 97 and 98 is cut. Shortly after this cut is made, a cam projection

129 mounted on the eccentric 72 also turning with the shaft 71 engages the roller 126 to move the arm 125 back to its initial position and thus through the connection just described swing the arm 118 back to return the knife 98 to its initial or spaced position relative to the cutter 97. Fig. 14 shows the cam 129 about to engage the roller 126.

Referring to Figs. 5, 33, and 34, the shaft 71 has its drive gear 128 meshing with a gear 129' on a lay shaft 130 carrying a gear 131 meshing with a gear 132 on a cone clutch member 133 slidably mounted on a vertically disposed transmission shaft 134 which has a cooperative cone clutch member 135 and pulleys 136 and 137 keyed thereto. The clutch member 133 is solenoid operated as hereinafter described, and when engaged, the shaft 71 is driven from the gear 132.

The pulley 136 is connected by a belt 138 with a pulley 139 on the armature shaft of an electric motor 140. A spring operated tensioner 141 may be associated with the belt 138. Thus the wrapper forming mechanism through the shaft 71 is driven from the motor 140 whenever the clutch member 133 is engaged. The pulley 137 is operatively connected by a belt 142 to a pulley 143 associated with the wrapping mechanism hereinafter described and shown in Figs. 2, 5, and 15. A spring operated tensioner 144 may be associated with the belt 142.

The coin counter

The coin counter may be of any suitable or known construction but is preferably of the type shown in Fig. 3, having a centrifugal wheel or disk 145 onto which the coins to be counted are fed and by which they are thrown out to the outer portion thereof which is surrounded by a shell 146, there being an adjustable gate 147 under which the coins pass from the wheel 145 to a passage 148 having a coin feed wheel 149 associated therewith and by which the coins are successively carried past a star wheel 150 to turn its shaft connected by bevel gearing 151 with a coin counting device 152, the counted coins then passing down a discharge chute 153. Complete details of coin counters of the type just referred to will be found by referring to U. S. Patent No. 2,378,828, of June 19, 1945, to A. R. Buchholz et al., and U. S. Patent No. 1,811,503, of June 23, 1931, to J. Janosky et al. Both of these patents show a coin counter using a centrifugal wheel for carrying the coins to an adjustable outlet gate, and the feed wheel 149 which by adjustable count determining control mechanism is rendered inoperative after a predetermined number of coins have been counted and discharged into the chute 153. They differ from each other in certain details and especially in the specific means for controlling the action of the feed wheel 149 on the coins. In the Janosky et al. patent its coin feed wheel therein designated 12 is continuously driven, and it is moved into and out of operative relation with the coins in the feed passage for the counting and discharge of a predetermined number of coins by mounting its shaft 36 so that its wheel carrying end may be tipped upwardly by mechanism operable after a predetermined number of coins have been counted and delivered to the coin discharge tube. In the Buchholz et al. patent as well as in the details thereof, shown herein in Figs. 29 to 32, the coin feed wheel 149 is mounted on a shaft 154 having a toothed clutch member 155 slidably keyed thereto and adapted to normally engage a cooperative clutch member 156 associated with a pulley 157 connected by a belt 158 with a pulley 159 on a transmission shaft 160 which carries a pulley 161 connected by a belt 162 with a pulley 162' on the shaft of a counter drive motor 163 shown in dotted lines in Fig. 3 and connected as shown in Fig. 35 by conductors 164 and 165 to the current supply lines 166, there being a manually operated switch 167 in the conductor 164 which is also shown in Fig. 15. Thus when switch 167 is closed, shaft 160 and clutch member 156 are continuously rotated as well as the wheel 145 or hopper bottom plate which is mounted on a shaft 145' connected to said shaft 160 by suitable gearing such as the spiral gearing 160' and 161'. The clutch member 155 is moved into and out of operative engagement with the continuously rotating clutch member 156 by a shift lever 168 pivoted at 169, see Fig. 29, and connected at its lower end by a screw 170 to a shift bar 171 which is identical with the bar 80 of U. S. Patent No. 2,378,828 except that bar 171 has a depending switch operating arm 172 to engage and close a normally open switch 173 when the clutch lever 168 is shifted to disengaged position and which switch as hereinafter described is in the control circuit for the solenoid operated clutch member 133. The clutch members 155 and 156 are normally urged into engagement with each other by a spring 156' and the bar 171 is moved to open clutch 155, 156 after a predetermined number of coins have been fed past said feed wheel 149 by mechanism shown in detail in Figs. 9, 10, and 11 of said Patent No. 2,378,828. Referring to Figs. 31 and 32, the lever 174 pivoted at 174' corresponds to the lever 98 of said patent and is moved to inoperative position by a spring 175, and instead of the hand operated arm 112 of said patent, said lever 174 has a rack bar 176 pivoted thereto at 177 and guided at its outer end by a pin and slot connection 178 which meshes with a gear 179 on a shaft 180 which carries a crank arm 181 which is adapted to be engaged by a roller 182 on a swinging coin discharge tube support 183 that is pivoted at 183' and normally urged by a spring 184 to engage said arm 181 and swing the same to turn said shaft 180 to move the lever 174 to the re-setting position shown in Fig. 31 in which position the counter is ready to supply a predetermined number of coins to a discharge tube 185 whose upper end then alines with the lower end of the discharge chute 153. Movement of support 183 is limited by an adjustable stop pin 185'. Lever 174 is moved to inoperative position by the spring 175 when arm 181 is released from engagement with roller 182 on support 183 when said support with tube 185 swing outwardly to the position shown in Fig. 32 by a cam 186 mounted on the shaft 71 and engageable with a roller 184' on the support 183. Thus it will be noted that with the Buchholz type of counter the movement of the lever 174 sets the counter including the feed wheel 149 in operation and through the mechanism more particularly shown and described in said patent after a predetermined number of coins have been counted and discharged into the tube 185, the feed wheel drive clutch is opened to stop the counter from operating until the mechanism is again re-set.

In the present apparatus the discharge or coin transfer tube 185 is swung from a coin receiving position shown in Fig. 31 to a coin discharging position shown in Fig. 32 at which time a stack of counted coins are delivered to one of the packaging units hereinafter described. In as much as it is important that this stack of coins be guided as a unit, the discharge tube 185 is made interchangeable with other similar tubes, so that each tube is of a size to accommodate one denomination of coin. For interchangeably connecting these tubes the tube support 183, see Figs. 29 to 32, has a longitudinally extending groove 187 with an alining pin 188 in its upper end. Each tube 185 has a tongue 189 to register in said groove 187 and a bore 190 to receive pin 188, and it also has a yoke 191' that is movable through an apertured portion, see Fig. 30, of the support 183 and includes a pin 191 that is adapted to be engaged by a hooked lock lever 192 pivotally mounted on a pin 193 on the support 183 and normally urged to a locked position by a spiral torsion spring 194 operatively connected to said pin 193 and said lever 192 which has a handle 195 for manual release. The open bottom of the discharge tube 185 swings over the flat top of the packaging unit then in a position to receive coins.

The packaging mechanism

The packaging mechanism comprises a number of packaging units, one for each denomination of coin and all radially disposed and mounted on a turntable supported from the top plate **65**, and its center is that of the shaft **71**, so that each of said units may be operated by a single drive mechanism, see Figs. 4, 13, 15, and 16, said turntable including frame members **196** in which the shaft **71** is journalled. The details of the packaging units and the packaging mechanism are shown in Figs. 13 to 28, inclusive, and reference is also made to the copending application of Jens Julius Jorgensen, Serial No. 674,822, filed June 6, 1946, now U. S. Patent No. 2,635,402 for coin wrapping machine embodying features of each of the units herein. In said application the packaging mechanism has three wrapper rollers as an integral part. In the present application each packaging unit has two wrapper rollers **197** which when a unit is in operative position cooperate with a third roller **198** common to all the units and with respect to which the turntable **196** may be moved so as to bring any desired packaging unit into register with the preselected discharge tube **185** that shifts the counted stack of coins from the counter to a position over the packaging tube of the packager unit.

For indexing the turntable in the desired position and bringing the wrapper roller **198** into operative association with its drive gear and the wrapper rollers **197** of the selected packaging unit, the structure shown in Figs. 2, 15, and 28 is provided and includes an upright fixed frame member or pivot **199** upon which a door or support plate **200** is pivotally mounted. Plate **200** has bracket arms **201** in which a vertically disposed shaft **202** is pivotally mounted upon the upper end of which is secured a latch **203** adapted to engage one of the locating or indexing pins **204** on each of the packager carrying sections of the table to hold the same in operative position and which at its lower end carries a hand crank **205** extending through a slot **206** in the plate **200**. Pivotally mounted on the shaft **202** between the arms **201** is a forked roller carrying support **207** in which the shaft **198'** for the roller **198** is rotatably mounted and which shaft carries a gear **208** adapted to mesh with a wrapper roller drive gear **209** when plate **200** is in closed or locked position. The roller **198** is urged inwardly by a spring **210** bearing against an arm **211** on support **207** and surrounding a rod **212** slidably mounted at one end in the arm **211** and pivotally supported at its other end on an arm **213** pivotally mounted at **214** on the arm **211**. The arm **213** is adapted to bear against a stop **215** on an upright fixed shaft **216** for each packaging unit when the same is in operative position so as to swing the same outwardly as viewed in full lines in Fig. 28 to tension said spring **210**. The latch **203** is normally urged to a locking position by a spring **217** connected at one end to the plate **200** and at its other end to crank arm **218** integral with said latch and fixed to the shaft **202**. The plate **200** with its associated parts may swing out to the dotted line inoperative position, see Fig. 28.

Each of the wrapping units includes a coin and wrapper receiving hollow metal tube **220** fixed at its end, see Fig. 13, to the frame **221** of the unit which is mounted on and secured to one of the faces **222** of the frame member **196**. This tube has a series of radially disposed relatively wide slots **223** to accommodate the wrapping rollers **197** and **198**, one side of one of these slots being extended by narrower slots **224** to admit the wrapper blank to the tube, crimper accommodating slots **225** at the top and bottom portions of said tube, and a stop accommodating slot **226** at the lower end of said tube.

A plate **227** having flanged guides **228** to accommodate the wrapper for the particular denomination of each wrapping unit is mounted on the frame **221** so as to guide the cut wrapper blank into the slot including the slots **224**.

As heretofore noted, the coin counter delivers a precounted stack of coins into the discharge tube **185** which is

thereafter moved by the arm **186** to the position shown in Fig. 32 at which time the coins drop from said tube **185** into the tube **220**. Just before the coins are delivered to the tube, the front pointed end of the cut wrapper W enters the interior of the tube through the slot including slots **224**.

With the wrapper in the position above noted, the rollers **197** and **198** cooperating with the tube **220** and the coins in said tube feed the wrapper into the tube between the same and the coins and wrap the same about the stack of coins.

The wrapping roller **198**, its mounting and its drive from the drive gear **209** has been previously referred to. Each wrapping roller **197** is mounted on a shaft **229** journalled in a hanger or bracket **230** and carrying a gear **231** meshing with the gear **209** so that all three rollers are continuously rotated by said gear, see Fig. 22, each hanger or bracket **230** is mounted to pivot or oscillate upon a fixed shaft **232** and has an arm **233**. A spring **234** is interposed between the arms **233** to urge said rollers **197** inwardly and the spring **210** urges the roller **198** inwardly into the slots **223** to engage the wrapper, as shown in Fig. 21, the inward movement of these rollers being limited by their engagement with an oscillatory cam **235** which is a circular plate provided with radially disposed notches **235'** for this purpose shown in Figs. 23 and 24 and by which said rollers are moved radially outwardly of said tube **220**, said cam **235** being mounted to turn on the lower end of the tube **220**, see Fig. 13, and having a slotted arm or crank **236** engaged by a pin **237** on an arm **238** secured to an oscillatory shaft **239**, Figs. 13, 15 and 18. Shaft **239** has an arm **240** secured thereto carrying a roller **241** engaged by a cam **242** on the shaft **71** and urged toward said arm by a spring **243** connected to an arm **244** on said shaft **239**, this movement being limited by an adjustable stop screw **245** engageable with the arm **244**. With the above construction when the wrapper blank is about to be introduced into the tube, the cam **242** oscillates shaft **239** to turn cam **235** to move the rollers **197** and **198** outwardly to permit the wrapper blank to be started into the tube just before a stack of counted coins are deposited therein. Immediately thereafter, the cam **235** releases said rollers, and the wrapper in the position shown in Fig. 21 is fed inwardly between the slot in the tube **220** and the front roller **198** and then between said tube, the rollers **197** and the coins. The rotation of the rollers **197** and **198** permit this feeding action of the blank or wrapper, the rollers then holding the stack of coins in spaced relation with the tube **220** until the wrapper under the pressure of the spring pressed wrapping rollers is completely and tightly wrapped about the stack of coins.

Referring to Figs. 2, 5, 13 and 15, each wrapper unit has the wrapping roller drive gear **209** mounted on a vertical tubular shaft **246** journalled in a bearing **247** of the frame and carrying a jaw clutch collar **248** which is adapted to engage with a cooperative jaw clutch **249** formed on the hub of the pulley **143** which it will be recalled is driven by the belt **142** from the continuously rotated pulley **137**. The clutch member **249** is moved into operative engagement with the clutch collar **248** when the selected packaging unit has been brought into its operative position by mounting the hub **250** of said pulley in a vertically adjustable journal member **251** which is connected to vertically disposed pins **252** slidably mounted in guide bores **253** of a package discharge member **254** and normally moved by springs **255** in said bores to a clutch engaging position, said member **254** having a package discharge slot **256** provided with an inclined discharge plate **257**. For disengaging the clutch **249** a manually operated lever **258** is intermediately pivotally connected at **259** to the journal member **251** and is hung at **260** from the upper end of a link **261** so that depressing the handle **262** of said lever **258** acts to move said member **251** downwardly against the action of the springs **255**.

Releasable stop mechanism for holding the coins in the tube 220 during the wrapping operation includes a stop member 261, means for swinging said member into and out of operative relation with the coins in the tube, and means for vertically reciprocating said member relative to its tube 220. Referring to Figs. 13, 14, 19, 25 and 26, stop 261 has a hub portion 262 mounted to turn on a fixed shaft 263 and carrying a flanged collar 264 provided with a cam or wedge surface 265 and a segmental slot 266 through which a drive pin 267 on a gear 268 also journalled on said shaft 263 projects. Gear 268 is recessed at 269 to receive a ball bearing 270 which acting on said surface 265 as the gear 268 is revolved acts to lift said stop 261 upwardly against the action of a return spring 271 engaging said hub. This lifting action of the stop occurs when through the turning of the gear 268 a stop arm 272 on said stop member 261 moves into engagement with a fixed stud shaft 273 upon which the hub 274 of a segmental gear 275 meshing with the gear 268, is free to turn or swing. Swinging of the gear 275 in one direction is effected by a torsion spring 276 having one end anchored to the frame 221 and the other end connected to the hub 274 of said gear 275 in which instance said gear rotates counterclockwise as viewed in Fig. 19, thereby turning the gear 268 clockwise and causing stop member 261 first to swing inwardly through the lower end of the slot 266 until it is stopped by arm 261 engaging shaft 273 and then be raised by the wedging action of the ball 270 against the action of the spring 271 until said stop 261 reaches its elevated position shown in dotted lines in Fig. 25, in which position it is held during the wrapping of the coins. For moving the stop 261 out of operative position in the tube 220 and against the action of the spring 271 the hub of the gear 275 has a cam follower or shoe portion 277 adapted to be engaged at the proper time in the cycle of operations of the machine by a cam 278 mounted on the shaft 71. It will be noted that this cam 278 operates to withdraw the stop 261 only for a relatively brief interval required to allow the wrapped coins to be discharged from the machine, see Fig. 18.

After the wrapper blank has been rolled tightly about the coins in the tube 220, portions of the same extend beyond the ends of the stack of rolled coins and the next step is to crimp or roll these extensions into beaded edges abutting the outermost coins of stack which is done by crimping members 279 and 280, which as shown in Fig. 39 complete the formation of the coin package. The upper crimping member 279 is longer than the member 280 and acts as a coin stop in conjunction with the stop 261 while the free ends of the wrapper are being rolled over and inwardly of the stack into crimped engagement therewith as the rollers 197 and 198 rotate the wrapped coins.

For accomplishing the crimping operation the members 279 and 280 are given an in and out oscillatory motion relative to the tube 220 and an inward and outward reciprocatory motion relative to the wrapped coins. As shown in Figs. 15, 16 and 18, each crimper is mounted on an oscillatory arm 281 whose hub is free to turn about the oscillatory shaft 239 and carries a guide arm 282 and a cam follower arm 283 carrying a cam roller 284 engaging one face of a double faced cam 285 mounted on the shaft 71. The guide arms 282 are slidably guided in a straight line movement by a guide shaft or member 286 fixed to the outer end of an arm 287 fixed to the oscillatory shaft 239 which as previously noted is oscillated by the engagement of the cam 242 with roller carrying arm 240 fixed to said shaft whereby the crimpers are moved radially in and out relative to the tube 220. The arms 281 are constantly urged toward each other under the control of the cam 285 by a tension spring 288 for each arm connected at one end to the arm to be moved and at the other to a fixed part of the machine, the cam surfaces of the cam 285 being so designed that after the crimpers 279 and 280 have been swung inwardly through the slots 235 in the tube 220 and shown in dotted lines in Fig. 41, the rollers 284 ride onto the narrower section of the cam, thereby permitting the springs 288 to move the crimpers into the full line position shown in Fig. 41 and in doing so complete the crimping of the ends of the package against the outermost of the wrapped coins. The crimping ends of the crimpers are designed to roll the free edges of the wrapper into a beaded coin engaging edge.

After the crimping operation, the release of the pressure of the rollers 197 and 198 on the wrapped package and the withdrawal of the crimpers 279 and 280 and the stop 261 from the tube 220 permits the wrapped package to drop by gravity from the machine.

From the above it will be noted that any one of the wrapping units when positioned in front of the counter and supplied with counted stacks of coins from the appropriate discharge tube 185 has its moving parts all driven from one set of operating cams on a driven shaft 71 and a single roller drive connection including pulley 143 driven from the continuously rotated pulley 137 by the belt 142, Fig. 5.

Referring to Figs. 33 to 35, the cone clutch member 133 which through the gearing previously described drives the shaft 71, has a collar 289 journalled on it and carrying diametrically disposed pins 290 which engage the forked portions 291 of a lever 292 pivoted at 293 and carrying at its outer end a headed rod 294 which is slidably mounted in said lever and normally moved against the same by a spring 295, the head 296 of said rod being pivotally connected by a pin 297 to a solenoid plunger 298 which works in a solenoid core 299 mounted with its coil 300 in a housing 301. A rod 302 slidably mounted in the housing 301 is urged by a spring 303 into engagement with the lever 292 so as to move the same and the clutch member 133 to a clutch release position. The solenoid plunger 298 acting through the spring 295 on the lever 292 moves the clutch member 133 to engaged position against the tension of the spring 303 and when the coil 300 of the solenoid is energized. Referring to Fig. 35, the electric motor 140 for driving the shaft 71 and the pulley 143 has a conductor 304 connected with one of the supply lines 166 and a conductor 305 connected to the other of the supply lines, conductor 305 being provided with a manually controlled switch 306. One terminal of the coil 300 is connected by a conductor 307 to the conductor 304. The other terminal of said coil is connected to a conductor 308 which connects with branch conductors 309 and 310 connected to the conductor 305 beyond the switch 306. Conductor 310 has the normally open switch 173 in it, and conductor 309 is provided with a normally closed switch 311 provided with a finger 312, see Figs. 31 and 32, which is adapted to be engaged by pin projection 313 on the cam 186.

With the above arrangement and referring to Figs. 29 and 35, if there are no coins supplied to the counter even though both switches 167 and 306 are closed, nothing happens since the switch 311 would then be opened by the cam 186 and the switch 173 would be in its normally open position because the counter clutch 155 would then be closed, and under these conditions the circuit to the coil 300 would be open, and consequently the clutch 133 would be disengaged so that shaft 71 would be stationary, the parts being then in the position shown in Fig. 31 which is the position in which the machine comes to rest when switches 167 and 306 are left closed after either all the coins have been counted or there is an insufficient number left to permit the counter to complete its predetermined count. To start operations, the counter is supplied with coins and the counter clutch 155 and 156 being engaged the feed wheel 149 is driven to feed a predetermined number of coins, usually fifty, to the discharge tube 185 then in its receiving position and the counter reset lever 174 being in its inoperative position while

the cam 186 is holding switch 311 open so that clutch 133 is disengaged. After the counter has operated to discharge the predetermined number of coins into the stacking or discharge tube 185, the control of predetermining mechanism of the counter actuated by parts associated with the shaft carrying the star wheel 150 acts to move the shift bar 171 to disengage clutch 155 as previously described and close switch 173 so current may then pass through conductors 310, 308, and 307 to energize coil 300 which then through plunger 298 and lever 292 acts to engage clutch 133 with clutch member 135 and through the drive connections previously described shaft 71 is rotated by the motor 140. As the shaft 71 turns from normal stop position shown in Fig. 31 to the position shown in Fig. 32, cam 186 moves off the switch finger 312 so that switch 311 closes assuring continued operation of coil 300 and engagement of the clutch 133 and continued operation of the shaft 71 until the wrapping cycle is completed. At about the same time that cam 186 releases switch finger 312 it engages roller 184' on tube support 183 swinging the tube 185 from coin receiving position to coin discharging position over the wrapper and coin receiving tube 220 shown in Fig. 32 and the precounted stack of coins then drop into the tube 220 and are wrapped as previously described while the shaft 71 makes one revolution. As the tube support 183 under the action of cam 186 swings outwardly, roller 182 moves away from arm 181 and spring 175 then acts on reset lever 174 moving it to the position shown in Fig. 32 at which time the counter predetermining mechanism is reset and shift bar 171 is moved back so that counter clutch 155 may again engage, and when cam 186 passes roller 184', spring 184 swings support 183 and tube 185 back to its coin receiving position shown in Fig. 31 and thereby moves reset lever 174 to its inoperative position so that the counter is again ready to feed coins to tube 185, and shaft 71 continues to revolve counterclockwise until cam 186 again engages switch finger 312 to open switch 311 and stop rotation of shaft 71 while the counter delivers another precounted number of coins to the tube 185. If for any reason the counter should be stopped during the counting operation by the jamming of a coin, then since the cam 186 has opened switch 311 and switch 173 is in its normally open position because clutch 155 would then be engaged, the wrapper mechanism is rendered inoperative. Thus the switches 311 and 173 act to stop the wrapper drive if for any reason the counter does not function either because of lack of coins or a stuck coin.

From the above it will be noted that the operation of the counter acts through the shift bar 171 to close the switch 173 and hence effect the engagement of the clutch 133 and that the operation of the cam 186 by the shaft 71 opens the switch 311 to effect disengagement of the clutch 133 and also controls the swinging movement of the discharge tube 185 from coin receiving to coin discharge position and the operation of the reset lever 174. The cam 186 is designed to effect the above operations in proper sequence so that the counter is discharging into the tube 185 while the shaft 71 is inactive and the counter is not active to discharge coins while the tube 185 is moving into and out of coin depositing position. When cam 186 has moved past roller 184' and coin tube 185 has moved back to the position shown in Fig. 31, the flow of coins into said tube commences, and normally a stack of coins will be in the tube by the time the previous stack has been wrapped and dropped and cam 186 has arrived at the position shown in Fig. 31. However, cam 186 will not move beyond this position unless the new stack or count is completed and switch 173 thereby closed. From this it will be noted that the counting and wrapping operations are going on simultaneously. It is to be noted that both the counter and the packager are active simultaneously except at such times as the transfer means is being operated. As but a single operating shaft 71 and its associated cams are used to operate each of the packaging units and each of these are mounted in the same relation to the cams even the inactive packagers will be driven by the shaft 71, and while this is not objectionable, it is not desirable to operate the crimpers and the cam stops of the inactive units, and in order to prevent this means are provided to render the crimpers and stops of such units inactive, said means including a cam plate 314 through which shaft 71 passes, said plate being held in fixed position by a bracket 315 and being of circular form except for a notch 316 which is positioned at its front adjacent that of a packager unit in its operative position. Referring to Figs. 17 to 20, where any one packaging unit is in its operative position, the notch 316 permits the crimpers and the stop mechanism of that unit to function as previously described under the action of the cams 242 and 278, but all the other packagers have their stop mechanisms and crimper swinging mechanisms rendered inoperative since the fixed cam 314 has then acted on an arm 317 secured to gear 275 of the stop mechanism to throw its cam operated arm 277 out of register with its operating cam 278 and has also acted on a shoe 318 associated with the arm 240 to throw the roller 241 out of the path of movement of the cam 242 and swing shaft 239 and consequently the crimpers arms 281 are swung out to and beyond their inoperative positions. Under these conditions also the crimper rollers 284 are moved out of contact with the cam 285 since in the outswung position, as shown in Fig. 39, they ride up on inclined stops 319 mounted on the shaft 216, and of course, the wrapping rollers of the inactive units are inactive since they are not then connected with their drive means.

While the counter hopper may be supplied with coins as needed by an operator or from an auxiliary hopper, this would require the constant attendance of the operator, and in order to obviate this and to get the highest efficiency possible from the apparatus, we prefer to use an automatic coin feeder controlled by the counter for supplying said counter. The feeder of the type above described which we prefer to use in combination with our apparatus is that shown and described in the copending application Serial No. 709,962, filed November 15, 1946, of A. R. Buchholz and W. A. Bargang, for Counting Machine, now Patent No. 2,581,074 dated January 1, 1952.

Referring to Figs. 36 to 38, a large storage hopper 320 is mounted on the frame 45, and coins deposited therein are carried upwardly therefrom by an endless conveyor 321 to the hopper or space H provided by the shell 146. The conveyor 321 is formed of pivotally connected link sections 322 running over spaced sprockets 323 mounted on shafts 324, the lower sprocket being driven from an electric motor 325 through a suitable reduction gear 326 and pulley and belt connections 327. The conveyor has side frame members 328 connected by a cross frame member 329 carrying a post 330 engageable with a stud 331 on the shell 146. Some of the link sections 322 have upstanding projections 332 which act as elevators, and these projections have centrally disposed slots 333 which cooperate with fixed stripper bars 334 at the upper end of the conveyor run to prevent the coins returning with the return run of the conveyor and thus insure their dropping on the inclined member 329 and their descent by gravity into the hopper of the counting machine.

In order to prevent the delivering means, such as the conveyor 321, from supplying a greater quantity of articles than can be efficiently handled by the counting machine, means are provided controlled by the amount of coins fed to the counting machine for controlling the conveyor drive motor 325. Referring to Fig. 38, this means includes a switch 335 of the normally closed type and which may be of the leaf spring type of known construction and switch control mechanism operated by the

coins on the disk 145 for moving the movable member 336 of said switch to open the same so as to stop the drive of the motor whenever a sufficient quantity of articles have been delivered to the counting machine. The switch control mechanism comprises an oscillatory shaft 337 journalled in a support 338 overhanging the disk 145 and carrying a coin engaging arm 339 and a switch engaging arm 340. With this arrangement when more than one layer of coins tend to collect or pile up in the hopper H at a point back from the periphery of the disk 145, as shown in Fig. 38, the uppermost of these coins on being carried under the arm 339 will lift or swing the same upwardly and turn the shaft 337, and due to its angular relation with the arm 340, said arm 340 is swung downwardly, thus depressing the switch member 336 to open the switch 335, it being noted that the weight of the arm 339 tends always to keep its lower end in a position where it may contact a greater height of coins than that which may form a single layer on the disk 145. Thus as long as any articles in the hopper H are engaging the arm 339, the switch 335 remains open, and no further feed of articles from the storage source occurs. As shown, the switch operates on coins in the second row formed by the centrifugal displacement of coins on the table or disk 145, and as soon as coins of the outer row are discharged past the drive wheel 149, the other coins from the inner portion of the disk move out to take their place and thus move out of contacting engagement with the arm 339, so that the arm may swing down due to gravity and act to turn the shaft 337 to move the arm 340 out of engagement with the member 336, so that the switch 335 closes and the motor 325 is again energized to drive the conveyor.

Referring to Fig. 35, the motor 325 is connected to the supply lines through line conductors 341 and 342 connected to conductors 164 and 165 and thus controlled by the manual start and stop switch 167. The switch 335 is connected in one of the line conductors such as the conductor 342.

From the above it will be noted that with the feeder mechanism above described the counting machine will not be overloaded or underloaded but will be constantly supplied with all the coins it can efficiently handle from the large storage hopper.

It is to be noted that the usual number of coins for a package is fifty for pennies and dimes, forty for nickles and quarters, and twenty for half dollars, and that the package forming mechanism and the wrapping mechanism are designated to accommodate these denominations in the numbers above mentioned.

I desire it to be understood that this invention is not to be limited to any particular form or arrangement of parts except in so far as such limitations are included in the claims.

What I claim as my invention is:

1. In a coin handling apparatus, the combination of a coin counting machine adapted to count and deliver coins in predetermined numbers, a coin wrapping mechanism, drive means for said wrapping mechanism including an electrically operated clutch, a control circuit for said clutch including a switch controlled by said coin counting machine for rendering said clutch operative and a switch controlled by the drive means for said wrapping mechanism for also rendering said clutch operative, start control means for said counting machine, coin transfer means movable between the counting machine and the wrapping mechanism for conveying the counted predetermined number of coins from said coin counting machine to said wrapping mechanism and movable on its return to receive counted coins from said counting machine, and means operable by said transfer means on its return movement for operating the start control means for said counting machine.

2. In a coin handling apparatus, the combination of a coin counting machine adapted to count and deliver coins in predetermined numbers, a coin wrapping mechanism, drive means for said wrapping mechanism including an electrically operated clutch, a control circuit for said clutch including a normally open switch closed by said counting machine at the termination of its count for rendering said clutch operative and a normally closed switch for also rendering said clutch operative and opened by the drive means for said wrapping mechanism while said coin counting machine is delivering coins, start control means for said counting machine, coin transfer means movable between the counting machine and the wrapping mechanism and operable by the drive means for said wrapping mechanism for conveying the counted predetermined number of coins from said coin counting machine to said wrapping mechanism and movable on its return to receive coins from said counting machine, and means operable by said transfer means on its return movement for operating the start control means for said counting machine.

3. In a coin handling apparatus, the combination of a coin counting machine adapted to count and deliver coins in predetermined numbers and of different denominations, a plurality of coin packaging units, there being a packaging unit for each separate denomination of coins to be counted by said coin counting machine, drive means common to all of the packaging units, means operable for positioning any selected one of said packaging units in operative relation with said coin counting machine, intermittently operating means for transferring the counted predetermined number of coins from the counting machine to the packaging unit then in operative position, each packaging unit including a coin stacking tube, rotatable wrapper wrapping rollers movable into and out of said tube, movable stop mechanism for the coins stacked in said tube and movable crimper mechanism for crimping the ends of the wrapper about the stacked coins, a continuously driven member, means connectible with said member for driving the wrapping rollers of the positioned unit, means common to all of said units for moving said rollers out of said tube and operating said stop and crimper mechanisms, and means for rendering said common operating means for the stop mechanisms and crimper mechanisms of inactive units inoperative to operate said mechanisms.

4. In a coin handling apparatus having wrapping rollers for wrapping a predetermined number of coins in a wrapper, wrapper blank forming mechanism comprising the combination of cutting mechanism for cutting off sections of the wrapping material to form wrapper blanks, a support for said cutting mechanism, means for adjustably positioning said cutting mechanism relative to said support for cutting wrapper blanks to a length suitable for the coin denomination to be wrapped, adjustable feed means for feeding the wrapping material as a web past said cutting mechanism, a single control for the cutter adjusting mechanism and the feed adjustment, and means for guiding a cut wrapper blank into position to be engaged by one of said wrapping rollers.

5. In a coin handling apparatus having wrapping rollers for wrapping a predetermined number of coins in a wrapper, wrapper blank forming mechanism comprising the combination of an adjustable support for the rolls of wrapping material of a width which vary with the denomination of coin to be wrapped, cutting mechanism for cutting sections of the wrapping material to form wrapper blanks, a support for said cutting mechanism, means for adjustably positioning said cutting mechanism relative to said support for cutting wrapper blanks to a length suitable for the coin denomination to be wrapped, feed means for feeding the wrapping material as a web past said cutting mechanism, adjustable drive means for said feed means, a single control for determining the adjustment of said roll support, the cutter adjusting means and the adjustment of said feed drive means, and means for guiding

a cut wrapper blank into position to be engaged by one of said wrapping rollers.

6. In a coin handling apparatus, the combination of a coin counting machine adapted to count and deliver coins in predetermined numbers including predetermined count control mechanism and having a driven coin feeding means rendered inoperative by said count control mechanism at the termination of a predetermined count, a control member for said coin feeding means to render the same operative, said coin feeding means being associated with a coin discharge passage, wrapping mechanism, drive means for said wrapping mechanism, control means for said wrapping mechanism drive means controlled by the predetermined count control mechanism of said coin counting machine, a coin discharge tube for receiving the predetermined count of coins from said discharge passage and delivering them to said wrapping mechanism, means controlled by said wrapping mechanism drive means for moving said coin discharge tube from coin receiving position at the outlet of said coin discharge passage to coin delivery position relative to said wrapping mechanism at the beginning of the wrapping operation, means for returning said tube to counted coin receiving position after said delivery, and means operable on the return movement of said tube to move said control member of said coin counting machine to render said counting machine operative for a predetermined count of coins when said tube is in counted coin receiving position.

7. In a coin handling apparatus, the combination of a coin counting machine adapted to count and deliver coins in predetermined numbers including a predetermined count control mechanism and having a driven coin feeding means rendered inoperative by said count control mechanism at the termination of a predetermined count, a control member for said coin feeding means to render the same operative, said coin feeding means being associated with a coin discharge passage, wrapping mechanism, drive means for said wrapping mechanism, control means for said wrapping mechanism drive means controlled by the predetermined count control mechanism of said coin counting machine, an oscillatory coin discharge tube for receiving the predetermined count of coins from said coin discharge passage and delivering them to said wrapping mechanism, means controlled by said coin wrapping mechanism drive means for swinging said discharge tube from coin receiving position at the outlet of said discharge passage to coin delivery position relative to said wrapping mechanism at the beginning of the wrapping operation, means for returning said tube to counted coin receiving position after said delivery, and means operable on the return movement of said tube to move said control member of said coin counting machine to render said counting machine operative for a predetermined count of coins when said tube is in counted coin receiving position.

8. In a coin handling apparatus, the combination of a coin counting machine adapted to count and deliver unmutilated run of the day coins in new or used condition in predetermined numbers of different denominations, a plurality of coin packaging units and coin transfer tubes, there being a packaging unit and a transfer tube for each denomination of coins to be counted by said coin counting machine, indexing means operable for positioning any selected one of said packaging units in operatve relation with said coin counting machine to receive a predetermined number of coins of the denomination being counted, a single transfer tube carrier, means for securing one of said coin transfer tubes to said carrier corresponding in denomination to the selected packaging unit, said carrier being movable from a coin receiving position to a packaging position, means for moving said carrier and its selected tube to convey the precounted coins as a unit from the coin counting machine to the packaging unit then in indexed position, a single drive means for the movable parts of all of said packaging units, and means for rendering all of the packaging units inoperative by said drive means except the unit positioned in operative relation with said counting machine to receive a predetermined number of coins of the denomination being counted.

9. In a coin handling apparatus, the combination of a coin counting machine adapted to count and deliver coins in predetermined numbers and of different denominations, a plurality of coin packaging units, there being a packaging unit for each separate denomination of coins to be counted by said coin counting machine, each packaging unit having a coin holder and a pair of wrapping rollers, means operable for positioning any selected one of said packaging units in operative relation with said coin counting machine, a wrapping roller mounted in front of said coin counting machine and movable into and out of operative relation with the rollers of any packaging unit positioned in operative relation with said coin counting machine, the three rollers when operatively positioned being substantially equidistantly circumferentially spaced relative to said coin holder, each of said wrapping rollers having a separately swingable mounting and being spring urged to a wrapping position, means for moving all of said rollers out of wrapping relation with said holder, means for positively driving said roller and the rollers of the operatively positioned unit, a plurality of coin transfer tubes, one for each denomination of coin to be packaged, a tube carrier, means for securing a transfer tube to said carrier corresponding in denomination to the selected packaging unit, and means for moving said carrier with its selected tube to convey the precounted coins as a unit from the coin counting machine to the packaging unit then in indexed position.

10. In a coin handling apparatus, the combination of a coin counting machine adapted to count and deliver coins in predetermined numbers and of different denominations, a plurality of coin packaging units, there being a packaging unit for each separate denomination of coins to be counted by said coin counting machine, each packaging unit including a coin stacking tube, rotatable wrapping rollers movable into and out of said tube, movable stop mechanism for the coins stacked in said tube, and movable crimping mechanism for crimping the ends of the wrapper about the stacked coins, a centrally disposed drive shaft for said units about which said units are arranged in radially spaced relation relative thereto, indexing means for radially positioning any selected one of said wrapping and crimping units in operative relation with said coin counting machine, intermittently operating means for transferring the counted predetermined number of coins from the counting machine to the packaging unit then in operative position, a continuously driven member, means connectible with said member for driving the wrapping rollers of the positioned unit, and means including said drive shaft, common to all of said units and controlled by the predetermined count control mechanism of said counting machine for moving said rollers out of said tube and operating said stop and crimper mechanisms.

11. In a coin handling apparatus, the combination of a coin counting machine adapted to separately count and deliver unmutilated run of the day coins in new or used condition of varying thicknesses in predetermined numbers including predetermined count control mechanism, a starting count control member and a coin feed means for feeding coins past the counter rendered inoperative by said predetermined count control mechanism and rendered operative by said starting count control member, a coin wrapping mechanism, drive means for said wrapping mechanism controlled by said predetermined count control mechansim, said wrapping mechanism including a coin holder, means for delivering a predetermined number of coins from said coin counting machine as a unit to the holder of said wrapping machine, and means operable on completion of the operation of said delivery means

to reset said starting count control member whereby the only time said coin counting machine and said wrapping machine are not operating is while said delivery means is operating.

12. In a coin handling apparatus, the combination of a coin counting machine adapted to separately count and deliver unmutilated run of the day coins in new or used condition of varying thicknesses including predtermined count control mechanism, a starting count control member, a coin feed means for feeding coins past the counter and rendered inoperative by said predetermined count control mechanism and operative by said starting count control member, a coin wrapping mechanism, drive means for said wrapping mechanism including a drive shaft, and a clutch for connecting said shaft to a source of power, control means for said clutch controlled by said predetermined count control mechanism, said wrapping means including a coin holder, means for delivering a predetermined number of coins from said coin counting machine as a unit to the holder of said wrapping machine, and means operable on completion of the operation of said delivery means to reset said starting count control member whereby the only time said coin counting machine and said wrapping machine are not operating is while said delivery means is operating.

References Cited in the file of this patent

UNITED STATES PATENTS

998,830	Batdorf	July 25, 1911
1,022,902	Ware	Apr. 9, 1912
1,038,361	Hart	Sept. 10, 1912
1,047,305	Sattley	Dec. 17, 1912
1,118,472	Casgrain	Nov. 24, 1914
1,484,066	Heinrichs	Feb. 19, 1924
1,619,615	Heinrichs	Mar. 1, 1927
1,632,344	Modlin	June 14, 1927
1,811,503	Janovsky	June 23, 1931
1,858,161	Logie	May 10, 1932
1,901,715	Young	Mar. 14, 1933
1,925,521	Chiger	Sept. 5, 1933
2,357,391	Francis	Sept. 5, 1944
2,378,828	Buchholz	June 19, 1945
2,581,074	Buchholz	Jan. 1, 1952