L. L. LADD.

SORTING MACHINE.

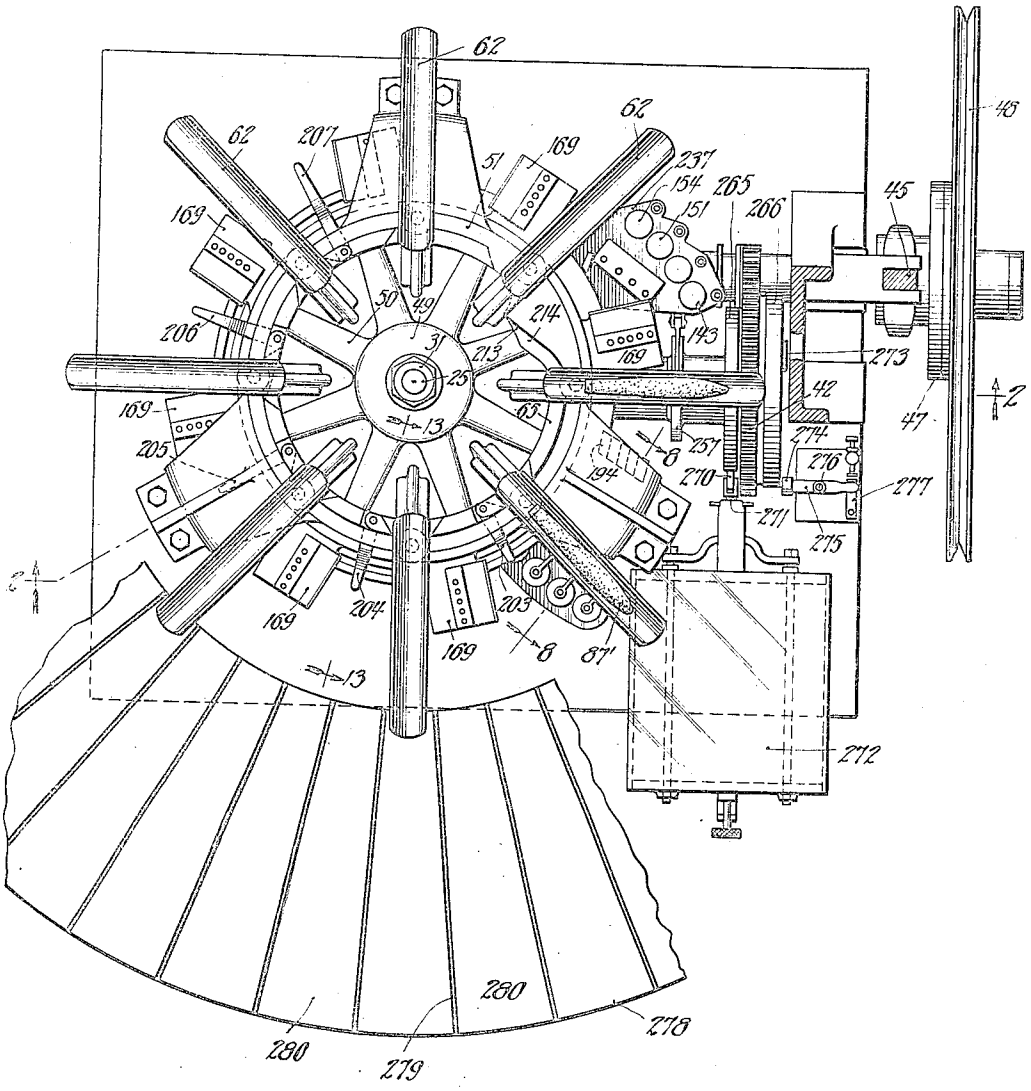
APPLICATION FILED OCT. 17, 1921.

1,432,762.

Patented Oct. 24, 1922.

7 SHEETS—SHEET 1.

Fig. 1.



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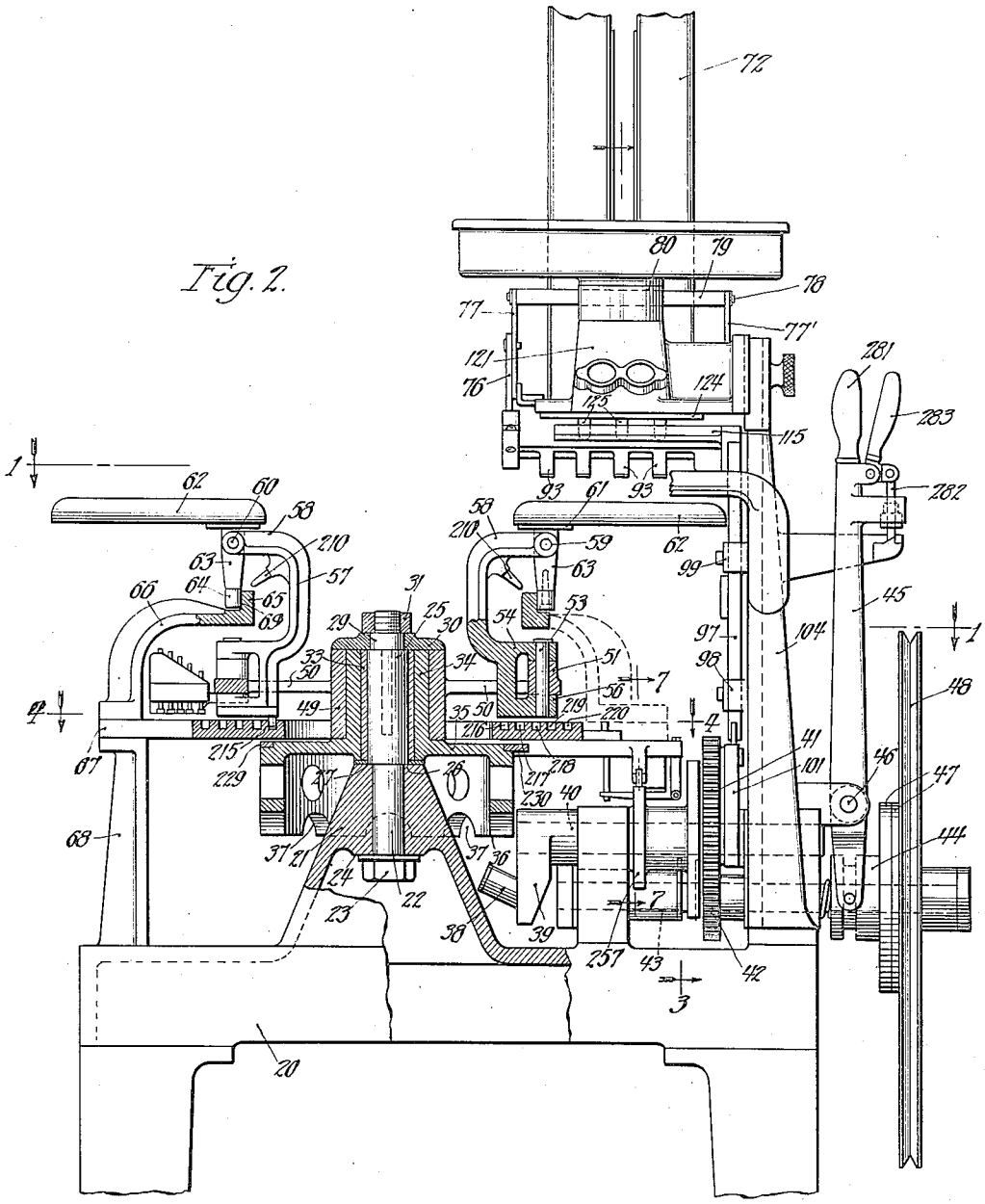
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7 SHEETS—SHEET 2.

Fig. 2.



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7 SHEETS—SHEET 3.

Fig. 3.

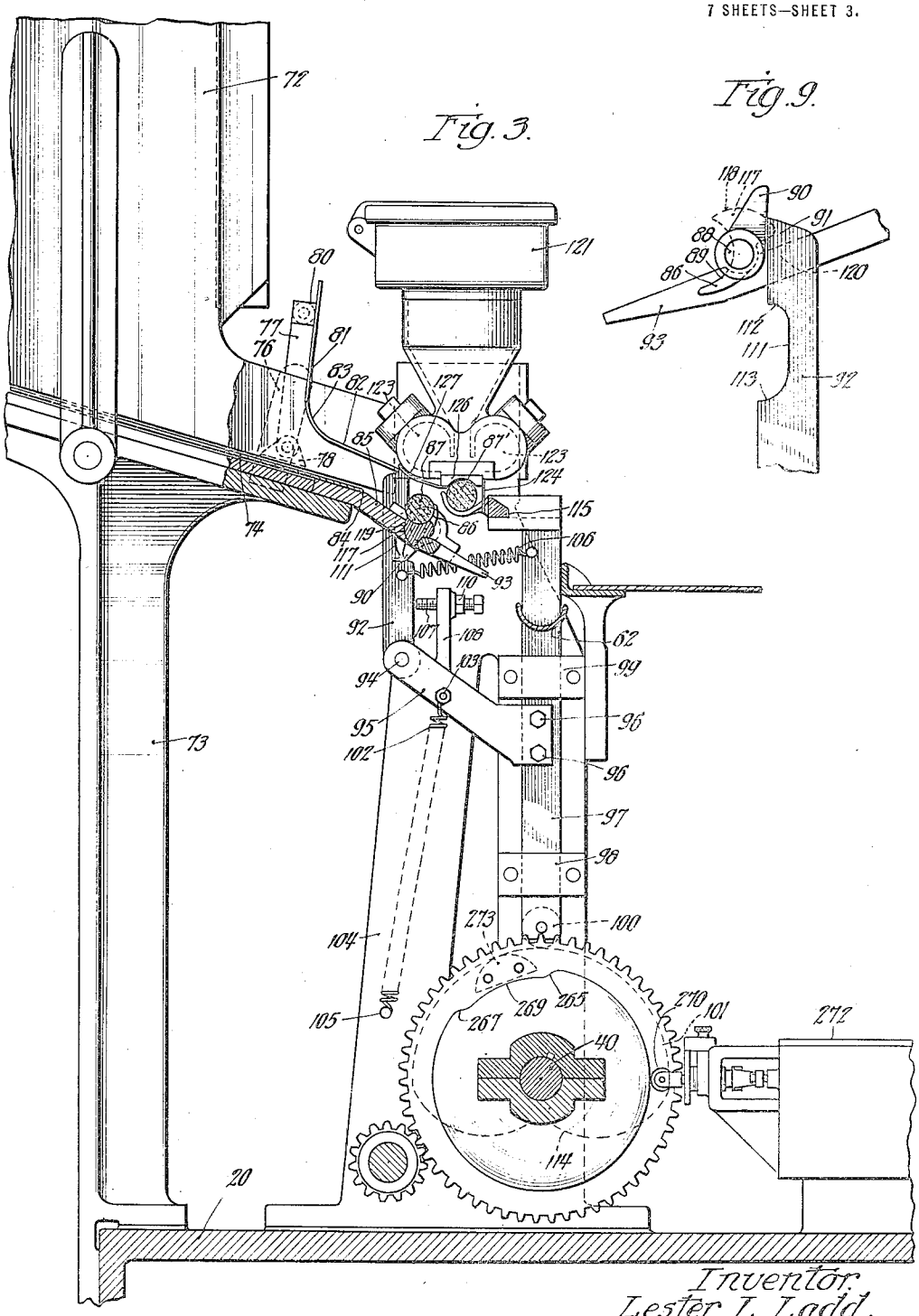


Fig. 9.

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7 SHEETS—SHEET 4.

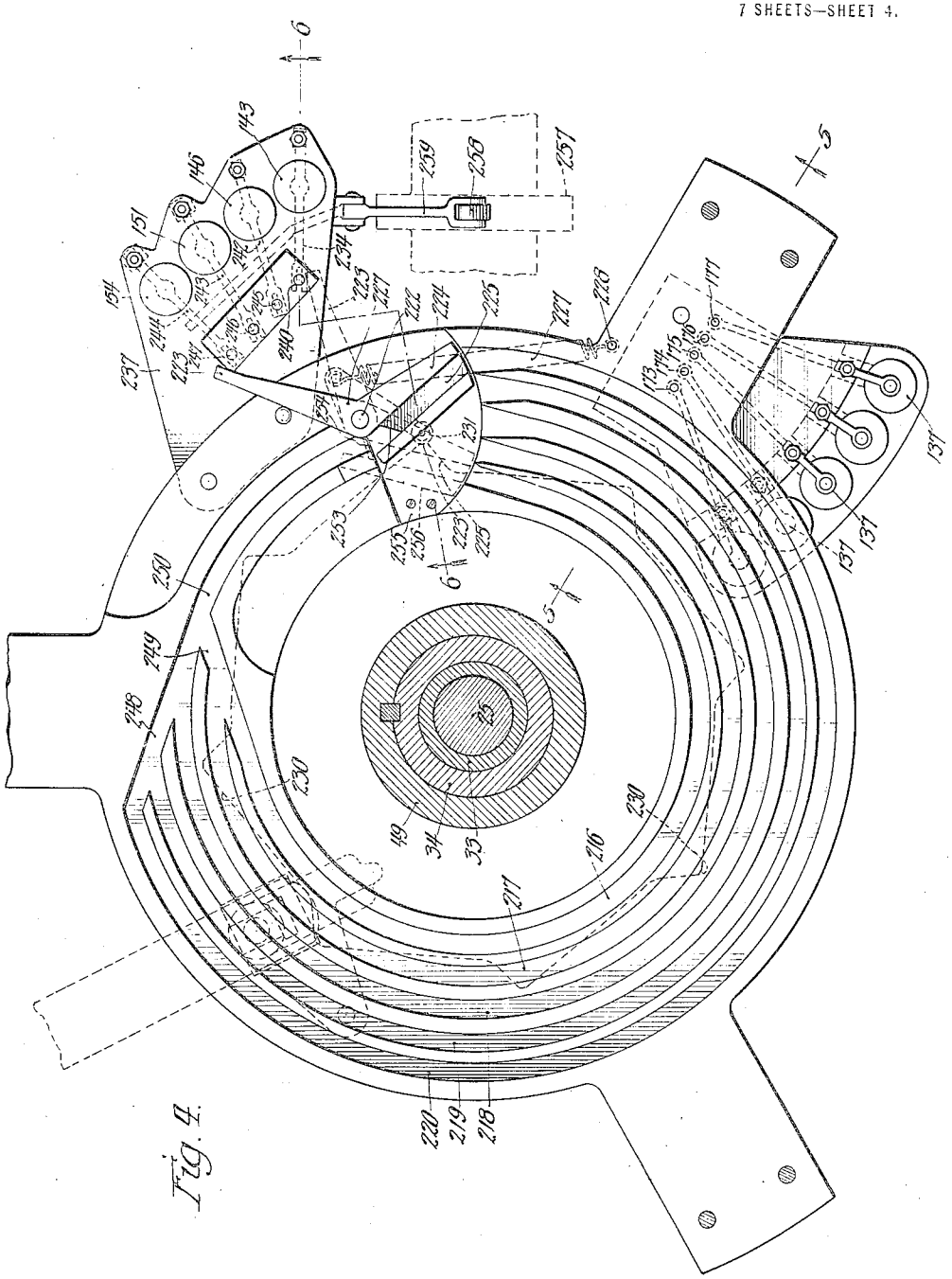


Fig. 4.

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7 SHEETS—SHEET 5.

Fig. 5.

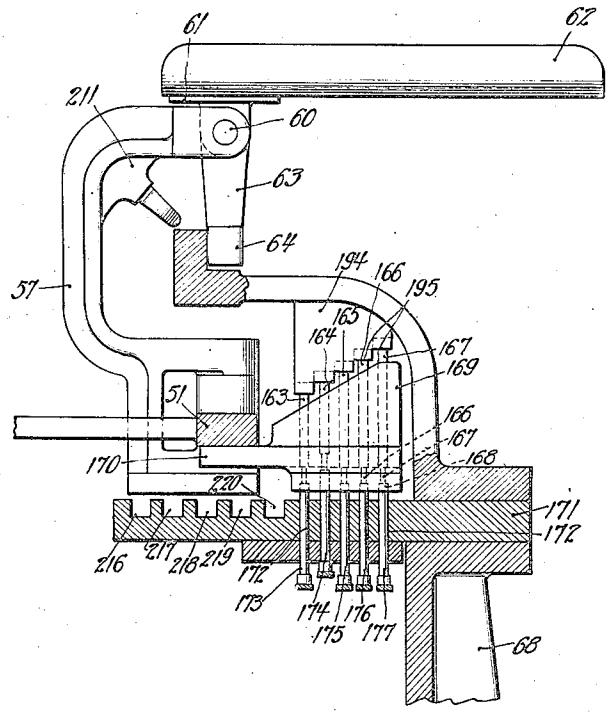
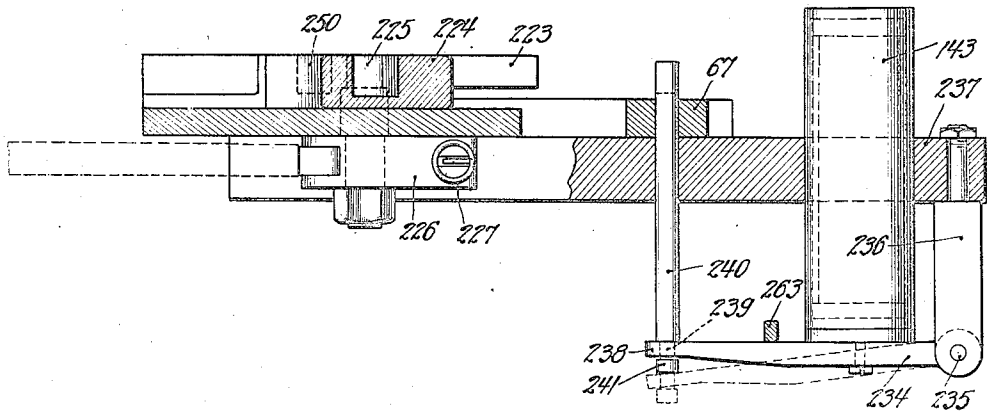


Fig. 6.



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7 SHEETS—SHEET 6.

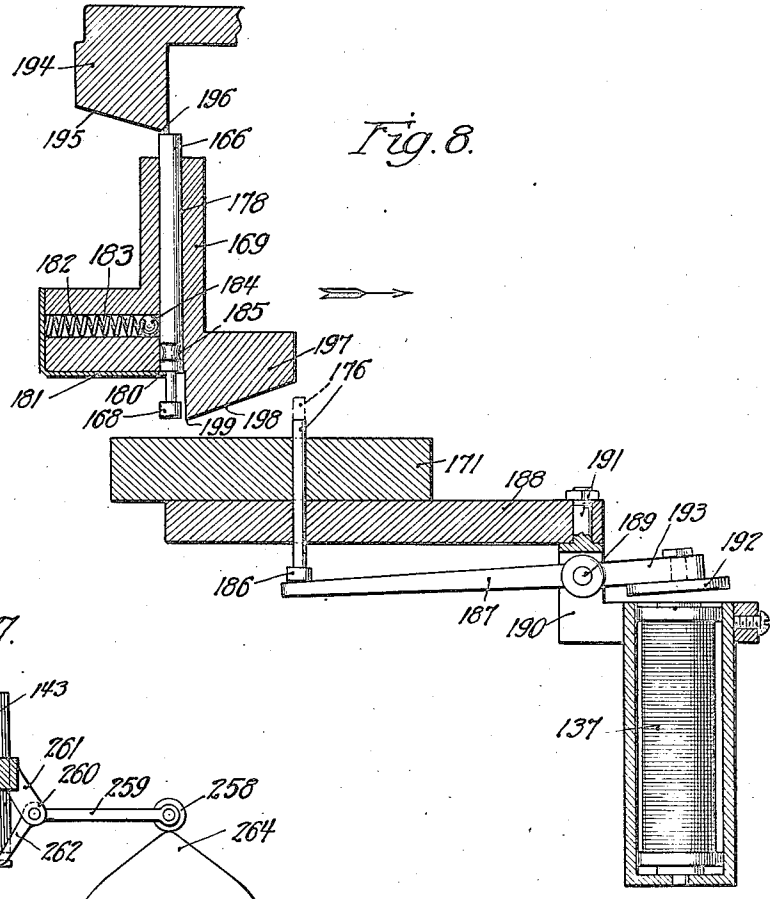


Fig. 8.

Fig. 7.

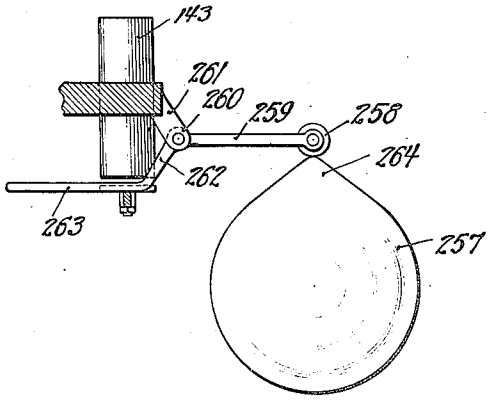
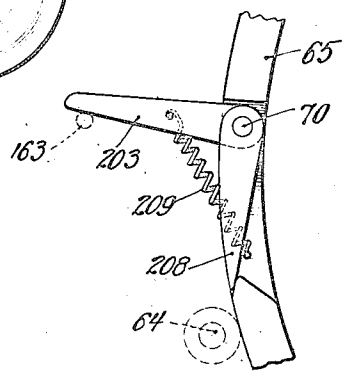


Fig. 10.



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7 SHEETS--SHEET 7.

Fig. 11.

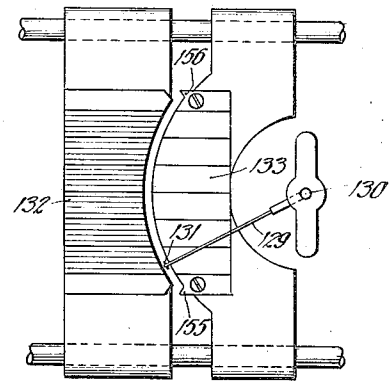


Fig. 12.

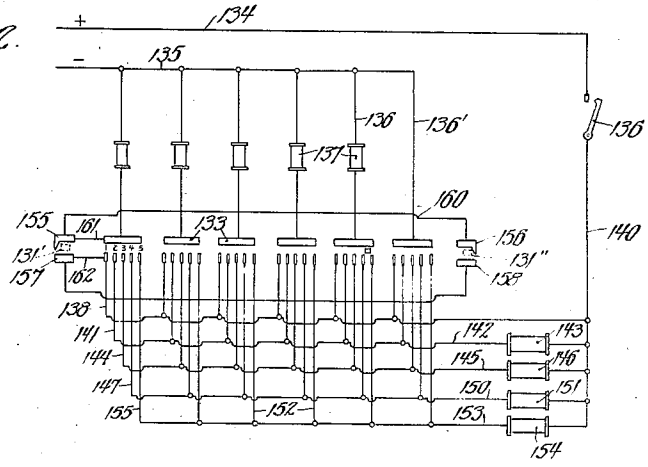
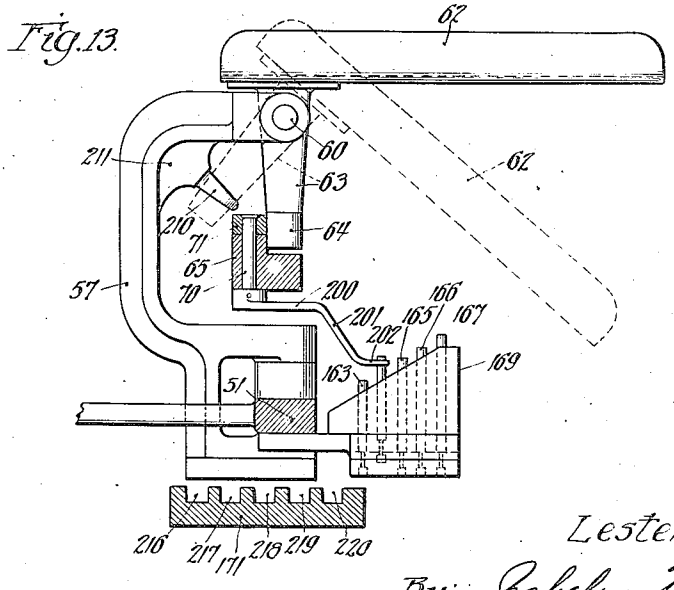


Fig. 13.



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Patented Oct. 24, 1922. 1,432,762

UNITED STATES PATENT OFFICE.

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SORTING MACHINE.

Application filed October 17, 1921. Serial No. 508,410.

To all whom it may concern:

Be it known that I, LESTER L. LADD, a citizen of the United States, residing at Lockport, in the county of Will and State of Illinois, have invented a certain new and useful Improvement in Sorting Machines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to sorting machines and more particularly to a machine for automatically sorting cigars according to color.

The invention relates to a machine for selecting articles in accordance with the color or shade thereof and depositing them at certain predetermined stations so as to assemble all the articles of a predetermined color or shade in one place.

The invention further relates to a machine whereby articles of various shades or colors are moved from a hopper into the range of a photo-electric cell and associated devices and are then carried to certain predetermined stations or dumping points in accordance with the effect produced on said cell, by the color or shade of the article.

It is a purpose of the invention to provide a sorting machine of the above mentioned character that is capable of accurate selecting or grading articles according to color into a large number of groups where the difference in shade or coloring of the different groups is very slight, and to provide a compact machine of this character that is capable of sorting articles in accordance with differences of color that are barely perceptible to the eye. The present invention operates according to the same general principles as the device shown in my copending application, Serial No. 419,848, filed Oct. 27, 1920, over which the present invention is an improvement.

It is a further purpose of the invention to provide a machine having a hopper for receiving the articles to be sorted with means for moving said articles successively, one at a time, into the range of a selecting device, and with means for carrying said articles away from said selecting device, after said articles have influenced said selecting device, said means being provided with means set while the article is influencing the selecting device, whereby said carriers are actuated to discharge said articles into receiving chutes at predetermined stations, each of said chutes discharging said articles at a different point, thus collecting all the articles of a given color or shade at one point.

It is still a further purpose of the invention to provide a machine having a hopper into which articles of various colors and shades can be dumped indiscriminately and fed automatically one at a time from said hopper to a mechanism that automatically sorts said articles and deposits them at predetermined stations so that articles of only one shade or color are deposited at each station.

It is still a further object of the invention to provide new and improved feeding mechanism for said machine whereby fragile articles can be fed one at a time to said machine without injury thereto, to provide a feeding mechanism that will deposit said articles always in substantially the same position on the means for moving the same into cooperative relation with said selecting mechanism, and to provide a member for moving said articles into cooperative relation with said selecting mechanism, that will receive the articles from the feeding mechanism without damaging the same.

It is still another purpose of the invention to provide means for delivering the article that has been moved into cooperative relation with said selecting mechanism to suitable article carriers which are adapted to carry the articles to a discharge station and discharge said articles at the proper station without damage or injury to the articles, thus collecting all the articles of a particular shade or color at the discharge station for said shade or color.

It is a further object of the invention to provide suitable selecting mechanism actuated by a photo-electric cell and associated devices, whereby articles are selected in accordance with the influence they have on said cell, and to so construct the selecting mechanism as to provide a large number of selections without unnecessarily multiplying the parts of the machine, and it is a particular purpose of the present invention to

reduce the number of discharge stations for the carriers and consequently the number of carriers required from that used in the device described in the above mentioned co-pending application. This is preferably accomplished by providing a plurality of discharge positions for the carriers at each discharge station, so as to discharge the articles in a plurality of different directions at each station. By increasing the number of angular positions of the carriers for each station the number of stations and the number of carriers required for a desired number of selections can be reduced.

It is moreover an object of the invention to provide a machine for selecting cigars according to color, wherein the cigars are fed one at a time from a hopper to a carrier that is adapted to move said cigars into position adjacent a photo-electric cell, and are transferred from said carrier to one of a plurality of traveling carriers that are adapted to discharge their contents at any one of a plurality of stations, dependent upon the color thereof, and in a plurality of different directions at each station, also dependent upon the color of the article.

It is also an object of the invention to provide traveling carriers of the above mentioned character, that travel always in the same horizontal path and which are adapted to dump by the action of gravity, and which are held in article carrying position without the use of spring catches or the like, thus simplifying the device, and providing a structure wherein the article carriers will not dump accidentally.

It is a further purpose of the invention to provide means independent of the traveling carriers to present the articles to the selecting device, whereby said carriers can be greatly simplified in structure.

It is another object of the invention to provide new and improved means for lighting the article when it is in position adjacent the photo-electric cell.

It is also an object of the invention to provide carriers of the above mentioned character that are adapted to be swung to a plurality of different angular positions about a vertical axis, in accordance with the effect produced by the articles thereon, on a photo-electric cell operating a selecting device associated therewith, and to provide guard means for preventing the articles from being thrown off the carriers by the swinging movement thereof.

It is still a further purpose of the invention to provide a selecting device of the above mentioned character having a hopper from which articles to be selected are discharged one at a time and are carried by a vertically operating carrier to a selecting device comprising a photo-electric cell, said carrier discharging the articles carried thereby onto one of a plurality of carriers moving in a horizontal circular path below said hopper and selecting device.

It is a further purpose of the invention to provide a plurality of article carriers of the above mentioned character adapted to discharge articles at predetermined points in accordance with the selections of a selecting device, which carriers are mounted to turn about a vertical pivot so as to assume a plurality of angular positions in accordance with the effect produced on the selecting device by the article carried thereby, said carriers being provided with overbalanced article holders which are adapted to swing on a horizontal pivot, said holders being provided with means for normally holding the same in article carrying position.

It is another object of the invention to provide an annular rib or track engaged by a depending member on said holders for holding the same in article carrying position and to provide a plurality of breaks in said track that correspond to the discharge stations of the machine, said breaks in the track being normally closed by switches, said switches being opened to dump said holders in accordance with the effect produced on the selecting device by the article carried by the particular carrier to be dumped. Said track is also provided with means for returning said holders to article carrying position.

Other objects and advantages of the invention will appear as the description of the accompanying drawings showing one form that my invention may take proceeds. However, I desire to have it distinctly understood that I do not intend to limit myself to the details shown in the drawings and described in the specification, but that I desire to include as part of my invention all such obvious changes in structure and modifications of parts as would occur to a person skilled in this art and as would fall within the scope of the claims.

In the drawings:

Fig. 1 is a plan view of the improved machine, parts thereof being broken away;

Fig. 2 is a section thereof taken on the line 2—2 of Fig. 1;

Fig. 3 is a section taken on the line 3—3 of Fig. 2, certain parts being shown in elevation;

Fig. 4 is a section taken on line 4—4 of Fig. 2;

Fig. 5 is a section taken on line 5—5 of Fig. 4;

Fig. 6 is a section taken on line 6—6 of Fig. 4;

Fig. 7 is a fragmentary detail section taken on the line 7—7 of Fig. 2;

Fig. 8 is a section taken on line 8—8 of Fig. 1;

Fig. 9 is an enlarged detail view of the feeding mechanism at the mouth of the hopper;

Fig. 10 is a detail view of the switch mechanism for the supporting rail;

Fig. 11 is a fragmentary plan view of the selector;

Fig. 12 is a diagram of the electrical connections controlled thereby, and

Fig. 13 is a section taken on line 13—13, Fig. 1, showing a carrier in dumping position in dotted lines.

Referring in detail to the drawings, the improved sorting machine comprises a framework having a base portion 20 provided with an upstanding member 21 in which is journaled the vertically extending shaft 22, said shaft being held in place by means of the nut 23, between which and the member 21 is interposed a washer 24. The shaft 22 is provided with an enlarged portion 25 forming a shoulder at 26 which rests on the upper surface 27 of the member 21. The shaft 22 is also provided with a reduced portion 29 upon which is mounted a cap or washer 30 which is held in place by means of the nut 31 provided on the upper end of the shaft 22. A sleeve 33 extends around the shaft 25 at the enlarged portion thereof, and surrounding the sleeve 33 is the sleeve-like portion 34 of the gear member 35 which is provided with suitable teeth 36 and suitable recesses 37 cooperating with the sleeve-like member 38 on the crank arm 39 mounted on the shaft 40 so as to give a step by step movement to said gear 35. The shaft 40 is provided with a gear 41 which meshes with the gear 42 on the drive shaft 43, said shaft being provided with a clutch 44 operated by the clutch operating lever 45 pivoted to the framework at 46, said clutch 44 connecting the member 47' with the cooperating member 47 on driving pulley 48 which is free on the shaft 43. Mounted on the sleeve-like portion 34 of the gear 35 to rotate therewith is the sleeve-like member 49 which forms the hub of a circular table that is adapted to rotate about a vertical axis. The table is made somewhat in the form of a wheel and has web or spoke-like portions 50 connecting the hub portion 49 with the peripheral or rim portion 51 thereof. It will thus be seen that the circular table comprising the members 49, 50 and 51 will rotate with a step by step movement about the shaft 25 together with the gear 35. The peripheral portion 51 of the circular table is provided with a plurality of openings 52 spaced equi-distantly around the same, and mounted in each of the openings is a pivot pin 53 for pivotally mounting the supporting bracket 54 having the arms 55 and 56 extending respectively above and below the peripheral portion 51, said arms being provided with openings that align with the openings 52 in the portion 51 of the table. The bracket 54 is also provided with a vertically extending portion 57 which extends upwardly from the main body portion of the bracket 54 and with a horizontally extending upper portion 58 which is provided with a transverse horizontally extending opening 59 through which the pivot pin 60 extends, said pivot pin pivotally supporting the article carrier 61 thereon.

The article carrier 61 is provided with an article holding member 62 and with a depending projection 63, the pivot pin 60 extending through said projection 63 to pivot the member 61 on the arm 58. The lower end of the member 63 is provided with a roller 64, said roller 64 engaging with the flange or rib 65 forming a track for guiding the same. The track or rib 65 is provided with the brackets or feet 66 which are mounted on the plate-like member 67, said plate-like member 67 being mounted on the legs 68 extending upwardly from the base portion 20 of the framework. It will be noted that the members 62 project a considerable distance to one side of the pivots 60, thus overbalancing the article carriers and causing the rollers 64 to engage the side wall 69 of the track or rib 65. As will be clear from Fig. 1 the track or guide rib 65 is annular in form and it will also be evident from Fig. 2 that said rib acts as a support for the article holder to hold the same in article carrying position, that is, in such position that the article holding portion 62 thereof is substantially horizontal. If the support were removed, then the article carriers would tilt to the position shown in dotted lines in Fig. 13, thus causing the article carried by the member 64 to be discharged therefrom. It will be clear upon reference to Fig. 3 that the article holding portion 62 is channeled being preferably curved to a substantially semi-circular form, as shown in Fig. 3, in order to accommodate an article, such as a cigar that is elongated and substantially circular in cross section with the axis of the article parallel with the axis of the holder. The article carriers are mounted so that the holders thereof extend in a radial direction normally as shown in Fig. 1, and they are arranged in spaced relation about the periphery of the table or supporting member.

Pivoted to the rib or track 65 by means of the pivot pins 70 are the switch members 71, said switch members 71 being positioned in cutout portions of the track 65 so as to permit the rollers 64 to pass through the openings in said rib or track at the places where the switches are located when the switches are swung out of said recesses or openings, thus permitting the roller 64 to pass inwardly of the rib or track 65 and tilting the carrier so as to discharge the article from the article holder, the carrier then

having the position as shown in dotted lines in Fig. 5. The opening of the switches is selectively controlled by a selecting device which is operated by the effect produced upon a photo-electric cell by the color of the article that is carried by the particular article carrier which is dumped by the switch actuated by the selecting device.

The articles to be sorted are placed in the hopper 72 which is supported upon a standard 73 and which is provided with a false bottom 74 which extends parallel to the bottom 75 of the hopper. The false bottom 74 is mounted for short reciprocating movements parallel to the bottom 75. The reciprocations are obtained by means of a structure similar to that shown in my copending application, Serial No. 419,848, filed Oct. 27, 1920 and allowed Feb. 12, 1921, said application showing an eccentric mounted on the shaft corresponding to the shaft 43 for this purpose. The forward end of the hopper 72 is provided with an upstanding bracket 76 which has pivotally mounted thereon the link 77, said link 77 being pivoted thereto intermediate the ends thereof. The lower end of the link 77 is pivoted to an ear 78 on the false bottom 74 and at the upper end thereof the link 77 is mounted on a transversely extending shaft 78 which extends through the sleeve 79, said sleeve 79 extending through a block 80 mounted on the sheet metal member 81 having the portion 82 extending substantially parallel to the false bottom 74 and joined with the vertically extending portion thereof by means of the curved portion 83. The opposite end of the shaft 78 is mounted on the link 77′ corresponding to the link 77, said link being pivoted to the member 74 in any desired manner. It will be evident that as the member 74 moves back and forth that the link 77 will swing first in one direction and then in the opposite direction so as to give the member 81 a reciprocating and swinging movement, so that as the member 74 moves forwardly toward the opened end of the hopper, the member 81 will swing counterclockwise with the sleeve 79 and block 80 and will move slightly away from the member 74 at the lower end 82 thereof, while when the member 74 is moved away from the open end of the hopper, the opposite movement of the member 81 will take place causing the member 82 to move downwardly toward the member 74 and also in the direction of the member 74. Due to the fact that the member 82 is inclined somewhat relative to the member 74, and due to the curved portion 83, the articles in the hopper will smooth out so that a single layer will rest on the bottom 74 adjacent the lower extremity 84 thereof, and accordingly when the member 82 is moved away from the member 74, as said member 74 moves downwardly, a cigar or other article in the hopper will be permitted to move outwardly from the hopper and off the false bottom 74, but only one of these articles will be permitted to pass as the member 82 will again be moving so as to prevent a cigar from passing between the same and the member 74 when one cigar has passed through the opening between said members. The cigar then passes down the inclined runway or lip portion 85 provided on the hopper and engages with the holding members or teeth 86, one of said articles being shown at 87 in such position in Fig. 3 of the drawings. The members 86, as will be clear from Fig. 3, are pivoted to the member 85, a plurality of said members being provided, as will be clear from Fig. 2. The members 86 are mounted on a common shaft 88 so as to rotate therewith and are provided with curved portions 89 in which the article is adapted to seat so as to be held securely in place. One of the members 86 is provided with a rearward extension or finger 90, which is adapted to be engaged by the end portion 91 of the slide 92.

It will be evident from Fig. 9 that as the slide 92 moves upwardly the end portion 91 will engage with the finger 90 and will rotate the shaft 88 in a counterclockwise direction, moving the members 86 to the position shown in Fig. 9, thus releasing the cigar or other article 87. The showing in Fig. 9 is the reverse of that shown in Fig. 3, so that the movement in Fig. 3 would be in a clockwise direction or downwardly toward the projecting teeth or spaced fingers 93 at the terminus of the member 85. Slide 92 is pivoted at 94 to the link 95, which link is bolted at 96 to the vertically extending arm 97. The arm 97 slides vertically between the guide members 98 and 99, and is provided at the lower end thereof with a roller 100, which roller engages with the surface of the cam 101 mounted on the shaft 40, as will be clear from Figs. 2 and 3. It will be evident from said figures that as the shaft 40 rotates, the cam 101 will cause the arm or rod 97 to reciprocate in a vertical direction, carrying with it the arm 95 and the link 92. A spring 102 secured to the arm 95 at 103 and to the standard 104 at the other end thereof, said standard being mounted on the base 20, is provided for the purpose of holding the roller 100 in engagement with the cam 101, said spring being secured to the standard 104 at 105, as shown in Fig. 3. Extending between the link 92 and the upper end of the arm 94 is a spring 106 which tends to pull the link 92 toward the arm 97. An adjustable stop member 107 is provided on the bracket 108 for limiting the movement of the member 92 toward the member 97. The member 107 is provided with a head 109 for turning the same and

with a lock nut 110 for locking the same in any desired position. The link 92 is provided with a recess or notch 111, which is provided with curved faces 112 and 113 joining the wall thereof with the side wall of the member 92.

It will be seen from Fig. 3 that when the low portion 114 of the cam 101 is in engagement with the roller 100, the arm 97 will be in its lowest position carrying with it the link 92. When the member 92 is in this position the end portion 91 thereof will engage with the rearward extension 90 of the member 86, thus causing the member 86 to tilt to the position shown in Fig. 9 and discharging the cigar 87 therefrom, and allowing the same to move therefrom onto the fingers 93. The upper end of the arm 97 is provided with a laterally extending arm 115, which is provided with a plurality of fingers or tines 116 which are curved, as will be clear from Fig. 3, and which are shown as carrying a cigar 87′ therein, said fingers being curved to conform substantially to the shape of the cigar 87′. When the parts are in the lowermost position, the fingers or tines 116 will be below the fingers or tines 93, and these fingers are positioned so that they will pass through the spaces between the fingers 93 in passing up or down relative to the same. As the parts are again moved upwardly after the roller 100 reaches the low part of the cam, the fingers 116 will pass between the fingers 93 and will pick up the cigar that is on said fingers and carry the same upwardly on the fingers 116. As the parts move upwardly the projection 90 will enter the recess 111 and will permit the fingers 86 to again assume the position shown in Fig. 3.

It will be seen upon reference to Figs. 9 and 3 that the members 86 are provided with counterweights 117 which tend to move the same in a clockwise direction in Fig. 9. The member 117 is provided with a rear curved face 118 which conforms to the curved cut-out portion 119 in the member 85. The curved portion terminates in a shoulder 120, which is adapted to engage the shoulder 121 on the member 85 to limit the movement of the member 86 in a counterclockwise direction in Fig. 3. As previously stated, when the member 92 moves upwardly the projecting portion 90 of the member 86 enters the recess 111 and the member 86 assumes the position shown in Fig. 3 so as to be in position to receive the next cigar 87 thereon from the hopper 72. When the member 97 moves downwardly, the member 86 is not disturbed as the projecting end portion 91 of the member 92 will slide over the curved rear face of the tooth or projection 90 without moving the same. Positioned above the end portion of the hopper is the casing 121 which contains a photo-electric cell which is adapted to accommodate the selecting device. The casing is provided with a central vertically extending opening 122 which allows the light obtained from the bulbs, which are located in the recesses 123 after the same has been reflected from the cigar, to pass upwardly in the casing so as to affect the photo-electric cell. The lower end of the casing is provided with a flange 124 depending therefrom, which is provided with guide fingers 125 for guiding the members 116 in their upward movement, and the casing is also provided with a block or plate 126 which is positioned over the opening in the lower end of the casing, and is provided with suitable openings for allowing the reflected light from the cigar to pass therethrough, said plate serving to expose the same area of each of the articles to the photo-electric cell. The member 126 is held in place by means of the spring strap 127 and is provided with a curved recessed portion 128 on the underface thereof adapted to receive the cigar 87′. As the fingers 116 again pass downwardly as the member 97 moves downwardly due to the engagement of the roller 100 with the lower portion of the cam 101, the same will pass between the fingers 93, which as will be clear from Fig. 3, are inclined at an angle so as to form an inclined plane or chute, and the cigar 87′ will be left behind on the inclined fingers 93 from which it will roll off onto the article carrier 62, which is in the position shown in Fig. 3 at this time.

It will thus be clear that as the member 116 moves upwardly and reaches a position so that the same is passing through the fingers 93, the member 86 will be tilted to release a cigar 87 and permit the same to move onto the fingers 116 which will be in a position at that time to catch the same. Then the cigar is moved upwardly to the position shown at 87′ in Fig. 3 where it affects the photo-electric cell within the casing 121 so as to accommodate selecting devices which will be described subsequently. After the cigar remains in this position a sufficient length of time to affect the cell, the time being governed by the length of the high portion of the cam 101, the fingers 116 will again move downwardly and in passing between the fingers 93 discharge the cigar onto the article carrier 62, the article carrier 62 being stationary as the step by step mechanism is not actuated the same when the cigar is discharged from the member 93, it being clear that as the step by step mechanism is actuated by the rotation of the shaft 40, and as the cam 101 is keyed to said shaft, the relationship of the cam and parts operated thereby to the step by step mechanism can be positively adjusted so that the relationship thereof is unvarying in the operation of the machine. When the cigar is in the position

shown for the cigar 87′ in Fig. 3, so as to affect the photo-electric cell, the current set up thereby through the photo-electric cell will be in proportion to the light reflected from the cigar or will vary in accordance with the color of the cigar.

An indicating instrument having an indicating needle 129 is provided to indicate the fluctuations in the current produced by the articles when affecting the photo-electric cell, said indicating needle 129 is pivoted at 130 and is provided at the end thereof with a contact member 131 which operates between the contacts 132 and 133 arranged on opposite sides of the same. In the present embodiment of the invention thirty contacts 132 are provided and six contacts 133, there being five contacts 132 opposite each contact 133. It is, of course, understood that any desired arrangement may be used. Of course, by providing a number of contacts 132 opposite each contact 133, that is, approximately the same as the number of contacts 133 employed, the duplication of mechanical parts can be the most advantageously reduced, the arrangement of the contacts being made for the purpose of multiplying the discharge points at each discharge station so as to reduce the number of carriers and the number of discharge stations required in the device. The operating circuit for the sorting devices comprises the positive and negative line wires 134 and 135 respectively, a switch 136 being provided in the line 135 to make and break the circuit as desired. In the present instance the circuit is mechanically made and broken, as will be described subsequently. Branching off from the line wire 135 is a plurality of leads 136 and a lead 136′, the leads 136 each being provided with an electromagnet 137 for operating certain sorting devices interposed between the line wire 135 and contacts 133. The wire 136′ leads to the contact 133 at one end of the cell directly without passing through an electromagnet or solenoid. In Fig. 12 one of the contacts 133 is shown as being opposite five contacts 132.

Referring now to Fig. 12, it will be noted that contact No. 1 of each set is provided with a lead 138 connecting the same with a common lead wire 139, which is connected directly with the wire 140 which leads to the switch 136; that contact No. 2 of each set is connected with a lead 141 which connects with a wire 142 leading to the solenoid 143 for operating certain sorting mechanism, and which is connected as shown in Fig. 12 with a wire 140. Contact No. 3 of each set is connected with a lead 144, all of said leads 144 leading to the common wire 145 connecting the same in series with the solenoid 146, the other end of which is connected with the wire 140. Contact No. 4 of each set is provided with a lead 147, all of which are connected to a common connecting wire 150, which has connected in series therewith the solenoid 151 operating certain sorting devices, the other end of which is connected with the wire 140. Contact No. 5 of each set is provided with the lead wire 152 connecting with a common wire 153 which has connecting therewith in series the solenoid 154 operating certain sorting devices, and the other end of said solenoid being connected with a wire 140.

It will thus be seen that as the contact member 131 moves along between the contacts 133 and 132 that various solenoids 137 and a suitable solenoid 143, 146, 151 or 154 as the case may be, will be energized depending upon the position of said contact member, or if the contact member is in position opposite one of the contacts numbered "1", only a solenoid 137 will be energized, while if the contact member 131 is opposite the contact member 133 connected with the wire 136′, only one of the solenoids 143, 146, 151 or 154 is energized. If the contact member 131 is in position opposite contact No. 1 of the series that is opposite the contact 133 connected with the wire 136′, no solenoid will be energized. The purpose of this is that certain of the sorting devices operate positively for one sorting position when no electromagnetic operated devices are actuated. The articles that affect the needle so as to place the contact 131 opposite contact No. 1 at the left of Fig. 12 will be discarded by the machine as they will be discharged at a point where no sorting occurs, thus 29 selections remain for the device described above.

The indicating instrument is also provided with stop members 155 and 156 to limit the movement of the needle 129 when the articles that cooperate with the photo-electric cell so as to effect the same are out of the range of selections of the machine. The stop members 155 and 156 also serve as contact members to cooperate with the moving contact 131. Opposite said stops are provided cooperating contact members 157, 158, said contact members 157, 158, being electrically connected by means of the wire 149. Similarly the stops 155 and 156 are electrically connected by the wire 160. The stops 155 and 156 are also electrically connected with the contact 133 at the left of Fig. 12 by means of a wire 161, and the cooperating contacts 157 and 158 are connected with contact No. 1 of the series cooperating with said contact 133 by means of the wire 162. Thus, it will be seen that if the contact member 131 is held in the extreme position indicated at 131′ in Fig. 12 or in the extreme position indicated at 131″ at the opposite side of the instrument, contact must be made either through the

members 155 and 157 with the contact 133 referred to above and the contact member 1 cooperating therewith, or through the members 156 and 158 in a similar manner so as to actuate the sorting devices in the same way as though the moving contact member 131 were in position between said member 133 and the contact member 1 cooperating therewith. The position of the parts is such in the actual machine that all articles out of the range of the instrument are discharged before reaching the sorting points of the machine, the first dumping position being that controlled by the contacts referred to above, this being the position discarding the articles that are out of the range of the machine.

When the article that is to be sorted is moved into cooperative relationship with the photo-electric cell to operate the selecting device, two sets of devices are set so as to be operated at the proper time for discharging the article at the desired point selected in accordance with the effect of the article upon the photo-electric cell. The article carrier is stationary when the article is effecting the cell, and when the article is received on the article carrier 64 that is in proper position for this purpose. However, the selecting devices will be operated at this time. One set of selecting devices that controls the stations at which the article is to be discharged comprises a plurality of stop pins 163, 164, 165, 166 and 167, each of said pins being provided with a head 168. The stop pins referred to are arranged in sets, there being one set associated with each article carrier 62, said pins being mounted in a block 169 and being slidable vertically therein, said block being mounted on an arm 170 secured to the peripheral or rim portion 51 of the rotating table. The framework of the machine is provided with a circular table 171 mounted on the leg 68. The table 171 is provided with a plurality of openings 172 through which the plungers 173, 174, 175, 176, and 177 pass, the plungers 173 being radially spaced the same distance from the center of the machine as the pin 163, and the plungers and pins 174 and 164, 175 and 165, 176 and 166, and 177 and 167 having the same relationship.

Referring now to Fig. 8, one of the pins 166 is shown enlarged approaching into cooperative relation with the plunger 176. The pin 166, as will be clear from Fig. 8, extends through an opening 178 in the member 169 and projects slightly therebeyond when in the position shown in Fig. 8. The pin 166 is in its lowermost position when in the position shown in Fig. 8 and the said pin is provided with a shoulder 179 which rests against the projecting portion 180 of the plate 181 so as to prevent further downward movement of said pin. The member 169 is also provided with a horizontally extending bore 182 within which is mounted a compression spring 183 and a ball 184. The pin 166 is also provided with a groove 185 within which the ball 184 is adapted to seat when the pin is projected upwardly so that the groove is in line with the bore 182. The plunger 176 is provided with a head 186 which is engaged by the extreme end portion of the lever 187 which is pivoted to the plate 188, which is secured to the member 67, and is stationary with the framework of the machine. The lever 187 is pivoted on a horizontally extending pivot 189 on the bracket 190 secured by means of the bolt 191 to said plate 188. The bracket also carries the solenoid 137 which is adapted to attract the armature 192 mounted on the rear end portion 193 of the lever 187. The other plungers 173, 174, 175 and 177 are operated in the same manner as the plunger 176. It will be evident from Fig. 8 that when the armature 192 is drawn down by the solenoid 137 that the plunger 176 will move to the dotted position shown in Fig. 8. The pin 168 will, however, then be in position directly above the plunger 176, the member 169 moving in the direction of the arrow shown in Fig. 8, thus the pin 166 will be raised the distance from the full line position to the dotted line position of the member 176 which will cause the grooved portion 185 to be moved opposite the ball 184. The ball 184 will then seat in the groove and hold the pin 166 in raised position.

In order to insure that no other pin than the pin 166 will be in raised position after the plunger has acted on the same, suitable means is provided for first positively depressing all the pins before being acted on by the plungers. For this purpose the framework of the machine is provided with a downwardly extending flange 194 having the beveled face 195 to provide a ridge or corner 196 spaced at such a distance from the member 169 that the pins 166 will be forced downwardly by engagement with such edge 196 which extends transversely across the path of movement of all said pins so that all the pins are in their lowermost position as shown for the pins 168. In order that the plungers will all be in their downward position as shown in full lines for the plunger 176 in Fig. 8, the members 169 are provided with a depending portion 197 which has a beveled edge 198 that engages with the plungers, the plungers being forced down until they engage with the corner 199 which is spaced from the plate 171 such a distance that the plungers will be in retracted position after the edge 199 is passed over the same. It is, of course, to be understood that the plunger is actuated by the selecting device dependent upon the position of the needle 129 and the contact member 131 in

accordance with the effect of the cigar on the photo-electric cell. Thus, if the movable contact 131 is in position opposite the contact member 133 that is connected with the solenoid 137 which operates the plunger 176, said plunger and the corresponding stop pin 166 will be actuated, while if the same is in some other position opposite some other contact 133 a different plunger and stop pin in accordance with the selection of the selecting device will be actuated.

It will be noted upon reference to Fig. 5 that the stop pins are of varying lengths, the stop pin 163 being the shortest and the stop pin 167 being the longest and the lengths of the other pins vary in stepped relation between said end pins. The member 194 is accordingly also provided with stepped beveled edges 195, this being necessary in order to properly position the pins 166 when in their depressed position. As previously stated the rib or track 65 is provided with a plurality of switches 71 which are mounted to turn with the pivots 70 which are rotatably mounted in the track 65. The lower ends of the pins carry arms that are adapted to turn therewith, said arms being of different lengths and of different shapes at different sorting stations about the machine. Each of the arms is provided with a horizontally extending part 200, a diagonally downwardly extending part 201 and horizontally extending lower portions 202.

Referring now to Fig. 1, it will be seen that the arm 203 is shorter than any of the other arms, the arms 204, 205, 206 and 207 gradually increasing in length. The arms are also depressed different distances below the portions 200, the arm 203 being depressed to a greater extent than any of the other arms, and the arm 207 being depressed the least, the others being depressed in stepped relation between the amount of depression of the arm 203 and of the arm 207. If the stop pin 163 associated with any carrier is raised, it will engage with the arm 203 and the carrier will be discharged at the first sorting station, as will be clear from Fig. 1, the roller 64 associated with said carrier moving into the opening provided in the track 65 when the switch blade 208 moves clockwise in Fig. 1 due to the engagement of the pin 163 with the member 203. After the roller has passed in back of the blade 208 the tension spring 209 will again return the switch to its full line position shown in Fig. 10. The roller 64 will then, however, be on the inner side of the rib or track 65. When the carrier 62 is moving to this position, the depending portion 63 will engage with the spring clip 210 provided on the boss 211 provided on the bracket 57 as shown in dotted lines in Fig. 13. In a similar manner the pin 164 will engage with the arm or lever 204 to dump the article carrier carrying the cigar that will affect the selecting device in a manner to project said pin, and the arms 205, 206 and 207 will be operated by the corresponding pins in a similar manner. In order to obtain an additional selection without the use of the plungers, stop pins, and electromagnetic devices referred to, a positive dumping position is provided following the position at the arm or lever 207, said positive dumping position being provided by terminating the curved rail or track 65 at 212, the end portion being beveled as will be clear from Fig. 1. It will thus be seen that as any given carrier moves around the machine that it will be dumped by the engagement of one of the stop pins associated with the same with one of the levers that operate the switches or by dropping off the end of the rail at 212. Upon moving further the roller on the carrier will engage with the inwardly turned end portion 213 of the rail at the other end thereof and will move along the inclined surface 214, whereby the roller is disengaged from the spring clip 210 and again moved to the outside of the curved rail or rib 65, whereupon the carrier 62 assumes the full line position shown in Figs. 2 and 5. The selecting device described above would only provide a small number of selections, and in order to multiply these selections suitable mechanism is provided which is adapted to turn the article carriers to a plurality of different positions at each station, said article carriers turning about a vertical axis. As previously stated each of the article carriers is mounted on a bracket which pivots about the pin 53 on the rim 51 of the revolving table. The lower arm 56 of the bracket is provided with a lug 215 which is adapted to engage is any one of the plurality of grooves or tracks in the plate 67, said grooves being numbered 216, 217, 218, 219 and 220 in the drawings. Any number of these grooves or tracks may be provided depending upon the number of selections desired and the number of multiplications at each station desired. As previously stated, the most advantageous arrangement to reduce the number of parts in the machine is to make the number of multiplications and the number of sorting stations as nearly equal as possible for the number of selections desired. It will be seen that if the roller or lug 215 is in the lowermost track or groove 216, the article carrier will be turned to one extreme angular position relative to the radial position thereof. When the lug 215 is in the groove 217, the carrier will be in an intermediate angular position relative to the radial between the radial position and the position assumed when the lug is in the groove 216. When the lug is in the groove or track 218 the carrier will

be in radial position, and when in the groove 219 in an intermediate angular position opposite that when in the groove 217, and when the lug is in the groove 220, the article carrier will be in the opposite extreme angular position. Thus five different angular positions of the carrier are provided at each sorting station. There being six sorting stations and five positions at each station there will be thirty selections in the present machine. However, as the first position is a discarding position for all articles not within the range of the machine there are only 29 actual selections provided.

In order to guide the roller into the proper groove in accordance with the effect of the article on the photo-electric cell, a selectively operated switch mechanism is provided, which mechanism is operated in accordance with the effect produced on the cell and in accordance with the position of the movable contact member 131 relative to the contacts of the selector. When the movable contact member 131 is opposite a small contact point 132, or any of the other contact points 132 corresponding to the said contact point, then the selecting device will be actuated so as to turn the switch to the same position, that is, if contact 1 of any one set of contacts 132 is connected with a contact 133 by means of the movable contact 131, the same effect will be produced as if any other contact 1 of any other set is connected with the contact 133 opposite the same by the movable contact member 131, and in a similar manner the same is true of the contacts 2, 3, 4 and 5.

The switch mechanism comprises a movable switch member 221 which is pivoted to the track carrying plate at 222, and which is provided with a rearwardly extending finger 223 and with a forwardly extending portion 224 having a guide groove or track 225 therein. Said switch is also provided with a laterally extending arm 226 to which is attached the coil spring 227, which is also attached to the framework at 228. As will be clear from Fig. 4 the spring 227 tends to hold the switch member 221 to the dotted line position shown in Fig. 4. The gear 35 is provided with a ring 229 which is provided with teeth 230 in the form of cams that are adapted to engage with a roller 231 provided on an arm 232 extending in a direction substantially opposite to the arm 226. As the roller 231 reaches the high portion 232 of the tooth 225, the switch is moved to the full line position shown in Fig. 4, thus the switch has a swinging movement from the dotted line to the full line position at every engagement of a tooth with the roller, one of said teeth engaging with the roller at each forward step of the gear and turntable structure. The switch would return immediately to the dotted line position due to the action of the spring 227 if suitable stops were not provided for holding the same in certain positions. However, stops are provided that are operated by the selector for this purpose. The coil 143, which is electrically connected with contacts No. 2, is provided with an armature 234 pivoted at 235 to the bracket 236 extending downwardly from the plate 137. The opposite end of the armature 234 is provided with a forked end 238, the two tines of which extend around the narrow neck portion 239 of the stop pin 240, said pin being provided with a head 241 at the lower end thereof, as will be clear from Fig. 6. If the electromagnet 143 is actuated by the selector the armature 234 will be drawn upwardly and the stop pin 240 will be projected upwardly beyond the plate 67, as will be clear from Fig. 6. In a similar manner the coil 146 is provided with a pivoted armature 242 and the electromagnet 151 with a pivoted armature 243 and the electromagnet 154 with a pivoted armature 244, said armatures engaging with the stop pins 245, 246 and 247 in a similar manner as the armature 234 engages with the stop pin 240.

It will be evident that when the movable contact 131 is opposite any contact 5 of the contact 132, the solenoid 154 will actuate the stop pin 247 which will then be in the path of movement of the arm 223 and will hold the switch in the full line position shown in Fig. 4. Similarly if the movable contact is opposite the contact No. 4, the solenoid 151 will be actuated to move the stop pin 246 into the path of movement of the arm 223 and arrest the movement thereof as the same is being returned to the dotted line position in Fig. 4 by the spring 227 at such an angle that the groove 225 will be in alignment with the track or groove 219, while if the solenoid 146 is energized due to the fact that the movable contact 131 is opposite a contact No. 3, the stop pin 245 will be projected so as to arrest the return movement of the switch when the groove 125 thereof is opposite the central track 218, and similarly the solenoid 143 will be energized to project the stop pin 240 when the movable contact member 131 is opposite a contact No. 2 to position the groove 225 so as to lead into the track 217, while if the movable contact 131 is opposite a contact No. 1, none of the solenoids will be energized, as this contact is in circuit with the wire 139, and the spring will draw the switch member to the dotted line position shown in Fig. 4, or align the groove 225 thereof with the innermost track 216. Thus, the guide roller or projection 215 will be guided into any desired track in accordance with the selection of the selecting device. Due to the position of the guide roller 215 relative to the pivot 53, the article carrier will be at its

extreme angular position to the left of the radial when looking outwardly from the center of the machine when the roller is in the inner track, and at the extreme opposite angular position when the roller is in the outermost track 220.

It will be noted upon reference to Fig. 4 that the two outer tracks are provided with a diagonal connecting portion 248 and the two inner tracks with a diagonal connecting portion 249, which lead to the common track 250 which is a continuation of the central track 218. The roller 215 will still be in the track 250 when the switch is actuated by the selecting device, and upon a further movement of the step by step mechanism the roller enters the groove 225 and from said groove 225 enters any one of the tracks in accordance with the selection of the selecting device. The switch operates in a depression 251 in the plate 67 and a curved shoulder 252 is provided at the forward end of the switch member to accommodate the member 224. The switch is also provided with a shoulder 253 which is adapted to engage with the shoulder 254, formed at the opposite end of the depression 251 to limit the movement of the switch due to the action of the spring 227. A leather stop member 255 is also provided which engages with the side face 256 of the member 224 to limit the movement of the member due to the action of the spring and to deaden any noise that would be caused by the sudden engagement of the shoulder 254 and the shoulder 253. It is necessary in order to properly operate the switch that the stop pins 240, 245, 246 and 247 be reset or retracted to their lowermost position after each actuation of the switch. For this purpose the cam 257 is provided on the shaft 40, said cam 257 cooperating with the roller 258 on the lever 259 pivoted at 260 to the bracket 261, said lever 259 being provided with the downwardly inclined portion 262 and with a horizontally extending arm 263, which is adapted to pass over all of the armatures that are associated with the solenoids 143, 146, 151 and 154, said arm being shown as passing over the armature 234 in Fig. 6. It will be seen that as the high part 264 of the cam 257 engages with the roller 258 that the lever is moved upwardly at the end at which the roller is located so that the portion 263 thereof will be moved downwardly so as to pull the pivoted armatures downwardly and the stop pins along therewith due to the heads 241 and the forked ends 238 on the armatures. The contact member 131 being small and the currents passing through the same being comparatively large, it is necessary that a good contact be made mechanically between the movable contact 131 and the contacts 132 and 133 opposite the same before the current is allowed to pass through the same. For this purpose the cams 265 and 266 are provided on the shaft 40. The cam 265 is provided with inclined portions 267 and 268 and depressed portions 269. Upon reference to Fig. 1, it will be seen that the cam 265 has cooperating therewith a roller 270 provided on the movable member 271 by means of which the contacts are permitted to move into engagement in the selecting device 272, the details of said selecting device not being shown in the present application. The cam 266 is provided with a lateral projection 273 which is adapted to engage with the head 274 on the lever 275 pivoted at 276 to the framework of the machine, said lever 276 operating an electric switch mechanism 277 so as to close the circuit when the member 273 engages with the member 274, said switch being normally held open by means of any suitable device, such as a spring, when the member 273 is not in contact with the member 274.

Upon reference to Fig. 3, it will be seen that the member 273 has left the member 274 before the low portion 269 of the cam 265 has passed the roller 270 and considerably prior to the time that the roller travels up the inclined portion 268 and onto the high part of the cam, thus the mechanical contact is made prior to the closing of the electrical circuit and the mechanical contact is not broken until after the electrical circuit has again been broken. The machine is provided with a receiving member 278 which is positioned outwardly beyond the path of movement of the article carries and slightly below the same, said receiving member being provided with vertically extending partitions 279 providing receptacles 280 therebetween there being one of said receptacles for each angular position of said article carrier at each sorting station. Thus, the article carriers discharge their contents into a receptacle 280 in accordance with the selection of the selecting device. All that is necessary in order to sort articles by the machine described is to close the proper electrical circuit by means of switches provided for this purpose, to fill the hopper with cigars that are to be selected and to operate the lever 45 by means of the handle 281, which is provided with a locking dog 282 operated by means of the lever 283 for holding the same in closed position, said lever 45 operating the clutch as previously described.

Having thus described my invention, what I desire to claim and secure by U. S. Letters Patent is:

1. In a machine of the character described, a selecting device, means for moving articles into the range of said selecting device, a plurality of article carriers adapted to receive the articles from said means, and means for dumping said carriers at stations selected by said selecting device, to sort said articles.

2. In a machine of the character described, means for selecting articles in accordance with the color thereof, a member for moving articles into the range of said selecting means, a plurality of article carriers adapted to receive the articles from said member, and means for dumping said carriers at stations selected by said selecting device, to sort said articles according to color.

3. In a machine of the character described, an electrically operated photometric selecting device, means for moving articles one at a time into cooperative relation with said selecting device, a plurality of carriers receiving articles from said means, and means operated by said selecting device whereby said carriers will deposit articles at predetermined points to sort said articles in accordance with the amount of light reflected therefrom.

4. A machine of the character described comprising a photo-electric cell, a selecting device electrically operated thereby, means for moving articles into the range of said cell to thereby operate said selecting device, means for receiving said articles after said articles have affected said cell to operate said selecting device and for moving said articles to a plurality of stations, and means controlled by said selecting device for depositing said articles at a selected station in accordance with the effect produced thereby on said cell.

5. A machine of the character described comprising a photo-electric cell, a selecting device electrically operated thereby, means for moving articles into the range of said cell to thereby operate said selecting device, means for receiving said articles after said articles have affected said cell to operate said selecting device and for moving said articles to a plurality of stations, and means controlled by said selecting device for actuating said last mentioned means to deposit said articles at a selected station in accordance with the effect produced thereby on said cell.

6. A machine of the character described comprising a photo-electric cell, a single selecting device operated thereby, means for moving articles into the range of said cell to thereby operate said selecting device, means for receiving said articles after said articles have affected said cell to operate said selecting device and for moving said articles to a plurality of stations, and means controlled by said selecting device for depositing said articles at a selected station in accordance with the effect produced thereby on said cell.

7. In a machine of the character described, a selecting device, means for moving articles one at a time into position to operate said selecting device, a plurality of article carriers adapted to receive the articles from said means, said carriers being normally held in article carrying position, means for releasing said carriers to dump said articles at a plurality of points, and means operated by said selecting device for operating any one of said releasing means to discharge the article carried by a carrier at a selected point.

8. In a machine of the character described, a selecting device, means for moving articles one at a time into position to operate said selecting device, a plurality of article carriers adapted to receive the articles from said means, said carriers being normally held in article carrying position, means for releasing said carriers to dump said articles at a plurality of points, and means operated by said selecting device and associated with said carriers for operating any one of said releasing means to discharge the article carried by a carrier at a selected point.

9. In a machine of the character described, a selecting device, means for moving articles one at a time into position to operate said selecting device, a plurality of article carriers adapted to receive the articles from said means, said carriers being normally held in article carrying position, means for releasing said carriers to dump said articles at a plurality of points, means operated by said selecting device and associated with said carriers for operating any one of said releasing means to discharge the article carried by a carrier at a selected point, and means for returning said last mentioned means to inoperative position.

10. In a machine of the character described, a hopper adapted to contain a plurality of articles of different colors, said hopper being provided with a feeding device, a selecting device, means for receiving articles one at a time from said feeding device and moving the same into the range of said selecting device, a plurality of article carriers adapted to receive said articles from said means, and means for dumping said carriers at stations selected by said selecting device to discharge said articles at selected stations by the action of gravity.

11. In a machine of the character described, a selecting device, a plurality of article carriers, means for moving a plurality of articles one at a time into the range of said selecting device, a support for normally holding said carriers in article carrying position, said support being movable out of supporting position at each of a plurality of discharge stations along the path of movement of said carriers and means for moving said support out of supporting position selectively controlled by said selecting device, whereby each of said carriers is released to discharge its contents at a selected station.

12. In a machine of the character described, a selecting device, a plurality of

article carriers, means for moving a plurality of articles one at a time into the range of said selecting dev e, a support for normally holding said carriers in article carrying position, said support being movable out of supporting position at each of a plurality of discharge stations along the path of movement of said carriers, means for moving said support out of supporting position, and means controlled by said selecting device for setting said last mentioned means so as to dump said carrier at any station selected by said selecting device.

13. In a machine of the character described, a selecting device, a plurality of article carriers, means for moving a plurality of articles one at a time into the range of said selecting device, a support for normally holding said carriers in article carrying position, said support being movable out of supporting position at each of a plurality of discharge stations along the path of movement of said carriers, means for moving said support out of supporting position, and means controlled by said selecting device for setting said last mentioned means so as to dump said carrier at any station selected by said selecting device, said support being provided with means for returning said carriers to article carrying position.

14. In a machine of the character described, a plurality of article carriers, a support for holding said carriers in carrying position, a selecting device, a member for moving articles one at a time into the range of said selecting device, said support being movable out of supporting position at each of a plurality of discharge stations along the path of movement of said carriers, actuating means for moving said support out of supporting position, said actuating means comprising a plurality of members each of which is adapted to cooperate with means associated with each of said carriers and with means on said support at one of said stations to move said support, and means controlled by said selecting device to operate a selected one of said members so as to discharge the contents of said article carriers at stations selected by said selecting device.

15. In a machine of the character described, a selecting device, means for moving articles into the range of said selecting device, a plurality of article carriers adapted to receive the articles from said means, and means for dumping said carriers at stations selected by said selecting device, to sort said articles, said selecting device being provided with means whereby all articles out of the range of selections of said selecting device are discharged from said machine.

16. In a machine of the character described, a cigar holding hopper, a plurality of cigar carriers arranged in a circular series and adapted to rotate about a common center in a step by step movement, a selecting device, means for feeding cigars from said hopper to said carriers, said feeding means comprising a member for moving said cigars one at a time into the range of said selecting device, whereby said carriers are adapted to discharge the cigars therefrom at stations selected by said selecting device.

17. In a machine of the character described, an article holding hopper, a plurality of carriers each adapted to support an article thereon, a selecting device, means for feeding said articles from said hopper one at a time and moving the same into cooperative relation with said selecting device, said carriers being arranged in a circular series and being adapted to rotate about a common center in a step by step movement, and receiving said articles from said means after said articles leave said selecting device, said carriers being adapted to dump the articles carried thereby at a plurality of stations along their path of movement, and means operated by said selecting device, whereby said carriers discharge said articles at the stations selected thereby.

18. In a machine of the character described, an article holding hopper, a plurality of carriers each adapted to support an article thereon arranged in a circular series and adapted to rotate about a common center in a step by step movement, a selecting device in juxtaposition to said carriers, a single carrier adapted to receive articles one at a time from said hopper, move said articles into cooperative relation with said selecting device and deliver said articles to a carrier of said circular series, and means operated by said selecting device, whereby said carriers discharge said articles at the stations selected thereby.

19. In a machine of the character described, an article holding hopper, a plurality of carriers each adapted to support an article thereon arranged in a circular series and adapted to rotate about a common center, a selecting device in juxtaposition to said carriers, a single carrier adapted to receive articles one at a time from said hopper, move said articles into cooperative relation with said selecting device and deliver said articles to a carrier of said circular series, and means operated by said selecting device, whereby said carriers discharge said articles at the stations selected thereby.

20. In a machine of the character described, a plurality of article carriers, a support for holding said carriers in carrying position, said support being provided with portions movable out of supporting position

to dump said carrier located at a plurality of points along the path of movement of said carriers, a selecting device, means for moving said articles into cooperative relation with said selecting device and feeding the same to said carriers, means for moving any one of said movable portions out of supporting position and means controlled by said selecting device to set said last mentioned means so as to remove the support from said article carriers at any point selected by said selecting device.

21. In a machine of the character described, a plurality of article carriers, a support for holding said carriers in carrying position, said support being provided with portions movable out of supporting position to dump said carrier located at a plurality of points along the path of movement of said carriers, a selecting device, means for moving said articles into cooperative relation with said selecting device and feeding the same to said carriers, means for moving any one of said movable portions out of supporting position and means controlled by said selecting device to set said last mentioned means so as to remove the support from said article carriers at any point selected by said selecting device, said support being provided with means for returning said article carriers to article carrying position.

22. In a machine of the character described, a plurality of article carriers, a support for holding said carriers in carrying position, said support being provided with portions movable out of supporting position to dump said carriers located at a plurality of points along the path of movement of said carriers, a selecting device, means for moving said articles into cooperative relation with said selecting device and feeding the same to said carriers, actuating means associated with each of said carriers for moving any one of said movable portions out of supporting position, said actuating means comprising a plurality of members, each of which is adapted to cooperate with means on one of said movable portions to move the same out of supporting position, and means controlled by the selecting device to operate a selected one of said members so as to discharge the contents of the article carrier associated therewith at the point selected by said selecting device.

23. In a machine of the character described, a plurality of article carriers, a support for holding said carriers in carrying position, said support being provided with portions movable out of supporting position to dump said carriers located at a plurality of points along the path of movement of said carriers, a selecting device, means for moving said articles into cooperative relation with said selecting device and feeding the same to said carriers, actuating means associated with each of said carriers for moving any one of said movable portions out of supporting position, said actuating means comprising a plurality of members, each of which is adapted to cooperate with means on one of said movable portions to move the same out of supporting position, and means controlled by the selecting device to operate a selected one of said members so as to discharge the contents of the article carrier associated therewith at the point selected by said selecting device, one of said movable portions being actuated by one of said members to discharge all of the articles out of the range of said selecting device from the machine.

24. In a machine of the character described, a selecting device, means for moving articles into the range of said selecting device, a plurality of article carriers adapted to receive the articles from said means, and means for dumping said carriers at stations selected by said selecting device, to sort said articles, said carriers being mounted so as to selectively discharge their contents in a plurality of directions at each sorting station.

25. In a machine of the character described, a selecting device, means for moving articles into the range of said selecting device, a plurality of article carriers adapted to receive the articles from said means, and means for dumping said carriers at stations selected by said selecting device, to sort said articles, said carriers being mounted so as to selectively discharge their contents in a plurality of directions at each sorting station, and means controlled by said selecting device for determining the direction of discharge of said carriers.

26. In a machine of the character described, a selecting device, means for moving articles into the range of said selecting device, a plurality of article carriers adapted to receive the articles from said means, and means for dumping said carriers at stations selected by said selecting device, to sort said articles, said carriers being mounted so as to assume a plurality of angular positions, the position of said carriers being controlled by said selecting device, whereby said carriers are adapted to discharge the contents thereof in a plurality of different directions at each sorting station, to sort said articles into a plurality of groups at each of said stations.

27. In a machine of the character described, a selecting device, a plurality of article carriers, means for moving a plurality of articles one at a time into the range of said selecting device, a support for normally holding said carriers in article carrying position, said support being movable out of supporting position at each of a plurality

of discharge stations along the path of movement of said carriers and means for moving said support out of supporting position selectively controlled by said selecting device, whereby each of said carriers is released to discharge its contents at a selected station, said support terminating short of one sorting station, whereby said carriers are positively dumped at said last mentioned sorting station.

28. In a machine of the character described, a plurality of article carriers, a support for holding said carriers in carrying position, said support being provided with portions movable out of supporting position to dump said carriers located at a plurality of points along the path of movement of said carriers, a selecting device, means for moving said articles into cooperative relation with said selecting device and feeding the same to said carriers, means for moving any one of said movable portions out of supporting position and means controlled by said selecting device to set said last mentioned means so as to remove the support from said article carriers at any point selected by said selecting device, said carriers being adapted to discharge their contents in a plurality of directions at each sorting station, the direction of discharge thereof being controlled by said selecting device.

29. In a machine of the character described, a plurality of article carriers, a selecting device, means for moving articles one at a time into the range of said selecting device and depositing the same on said carriers, and means for dumping said carriers at stations selected by said selecting device, said carriers being mounted so as to provide a plurality of selections at each of said stations.

30. In a machine of the character described, a hopper, a plurality of carriers mounted to move in a path below said hopper, a selecting device, and means for moving articles into the range of said selecting device and depositing the same upon said carriers, comprising a plurality of fingers mounted adjacent said hopper and a member adapted to be raised and lowered and having openings aligning with said fingers, said fingers being adapted to pass through said openings as said member is raised and lowered past the same.

31. In a machine of the character described, a hopper, a plurality of carriers mounted to move in a path below said hopper, a selecting device, and means for moving articles into the range of said selecting device and depositing the same upon said carriers, comprising a vertically reciprocable member, said member being provided with an article supporting member, said article supporting member having openings therein and said hopper having a plurality of fingers extending therefrom, in alignment with said openings and passing therethrough as said article supporting member moves past the same.

32. In a machine of the character described, a hopper, a plurality of carriers mounted to move in a path below said hopper, a selecting device, and means for moving articles into the range of said selecting device and depositing the same upon said carriers, comprising a vertically reciprocable member, said member being provided with an article supporting member, and a cam for raising and lowering said article supporting member, said article supporting member having openings therein and said hopper having a plurality of fingers extending therefrom, in alignment with said openings and passing therethrough as said article supporting member moves past the same.

33. In a machine of the character described, a hopper, a plurality of carriers mounted to move in a path below said hopper, a selecting device, and means for moving articles into the range of said selecting device and depositing the same upon said carriers, comprising a vertically reciprocable member, said member being provided with an article supporting member, and means for raising said article supporting member, holding said article supporting member in cooperating relation with said selecting device and lowering said supporting member, said article supporting member having openings therein and said hopper having a plurality of fingers extending therefrom, in alignment with said openings and passing therethrough as said article supporting member moves past the same.

34. In a machine of the character described, a hopper, a plurality of carriers mounted to move in a path below said hopper, a selecting device, and means for moving articles into the range of said selecting device and depositing the same upon said carriers, comprising a vertically reciprocable member, said member being provided with an article supporting member, and a cam for raising said article supporting member, holding said article supporting member in cooperating relation with said selecting device and lowering said supporting member, said article supporting member having openings therein and said hopper having a plurality of fingers extending therefrom, in alignment with said openings and passing therethrough as said article supporting member moves past the same.

35. In a machine of the character described, a hopper having a discharge opening, article holding means adjacent said discharge opening, a plurality of carriers mounted to move in a path below said hopper, a selecting device, and means for mov-

ing articles into cooperating relation with said selecting device comprising a vertically reciprocable member, an article support mounted thereon, said article holding means being mounted so as to be actuated by the movement of said reciprocable member to discharge an article from said hopper when said article support is in article receiving position.

36. In a machine of the character described a hopper having an inclined member extending therefrom terminating in spaced fingers, article holding members mounted on said member, a plurality of carriers mounted to move in a path below said hopper, a selecting device, and means for moving articles into cooperating relation with said selecting device comprising a vertically reciprocable member, an article supporting member mounted thereon, said article supporting member being provided with slotted portions adapted to accommodate said fingers, said article holding members being mounted so as to be actuated to release an article by the movement of said reciprocable member to a position when said article supporting member is in position to receive the same.

37. In a machine of the character described a hopper having an inclined member extending therefrom terminating in spaced fingers, article holding members mounted on said member, a plurality of carriers mounted to move in a path below said hopper, a selecting device, and means for moving articles into cooperating relation with said selecting device comprising a vertically reciprocable member, an article supporting member mounted thereon, said article supporting member being provided with slotted portions adapted to accommodate said fingers, said article holding members being mounted so as to be actuated to release an article by the movement of said reciprocable member to a position when said article supporting member is in position to receive the same, said article supporting member passing below said fingers when moving downwardly, whereby the article carried thereby is removed from said supporting member and deposited by the action of gravity on one of said article carriers.

38. In a machine of the character described, a hopper, guide means extending from said hopper, article holding means associated with said guide means, a selecting device, vertically reciprocable means comprising an article support, and means for actuating said holding means to release an article when said support is in position to receive the same therefrom, and means for moving said vertically reciprocable means so that said article support is in cooperating relation with said selecting device and maintaining said support in said position for a predetermined period of time.

39. In a machine of the character described, a hopper, guide means extending from said hopper, article holding means associated with said guide means, a selecting device positioned above said guide means, a plurality of article carriers moving in a path below said guide means, vertically reciprocable means comprising an article supporting member and means for actuating said holding means to release an article when said support is in position to receive the same therefrom, and means for moving said reciprocable means upwardly with the article on said support in cooperating relation with said selecting device, maintaining said article support in raised position for a predetermined period and moving said reciprocable member downwardly so that said support passes below said inclined guide member, whereby the article thereon is removed from said support and deposited on one of said article carriers.

40. In a machine of the character described, a hopper, article holding means movable into and out of holding position associated with said hopper, a selecting device, and means for moving articles into cooperative relation with said selecting device, said means actuating said holding means to release one article at a time from said hopper.

41. In a machine of the character described, a hopper, said hopper having a reciprocable member in the bottom thereof. means at the discharge end of said hopper actuated by said reciprocable member for arranging the articles at said discharge end in a single layer, article holding means associated with said hopper, a selecting device and means for moving articles into cooperative relation with said selecting device, said means actuating said holding means to release one article at a time from said hopper.

42. In a machine of the character described, a hopper, article holding means associated with said hopper, said means comprising a pair of fingers swingable into and out of holding position, means tending to move said fingers to holding position, a selecting device and means for moving articles into cooperative relation with said selecting device, said means actuating said holding means to release one article at a time from said hopper.

43. In a machine of the character described, a hopper, article holding means associated with said hopper, a selecting device and means for moving articles into cooperative relation with said selecting device, said means comprising a vertically extending arm having a laterally extending portion, a link swingingly associated therewith,

said link engaging with a finger on said article holding means to move the same to article releasing position and having a notch for receiving said finger to permit return of said holding means to holding position and spring means for holding said link in engagement with said finger.

44. In a machine of the character described, a hopper, article holding means associated with said hopper, a selecting device and means for moving articles into cooperative relation with said selecting device, said means comprising a vertically extending arm having a laterally extending portion, a link swingingly associated therewith, said link engaging with a finger on said article holding means to move the same to article releasing position and having a notch for receiving said finger to permit return of said holding means to holding position, spring means for holding said link in engagement with said finger, and an adjustable stop for limiting the movement of said link.

45. In a machine of the character described, a light responsive selecting device, sorting mechanism controlled by said selecting device, means for moving articles one by one into the range of said selecting device and means for exposing the same area of each of said articles thereto, said means being provided with a seat for receiving said articles.

46. In a machine of the character described, a light responsive selecting device, sorting mechanism controlled by said selecting device, means for moving articles one by one into the range of said selecting device, and a screen on said selecting device against which said articles are pressed by said means to expose the same area of each of said articles thereto, said screen being provided with a depressed seating portion for receiving one of said articles.

47. In a machine of the character described, a light responsive selecting device, sorting mechanism controlled by said selecting device, means for moving articles one by one into the range of said selecting device, a screen on said selecting device against which said articles are pressed by said means to expose the same area of each of said articles thereto, said screen being provided with a depressed seating portion for receiving one of said articles, and means for uniformly illuminating said articles while in position against said screen.

48. In a machine of the character described, a light responsive selecting device, sorting mechanism controlled by said selecting device, means for moving articles one by one into the range of said selecting device, a screen on said selecting device against which said articles are pressed by said means to expose the same area of each of said articles thereto, said screen being provided with a depressed seating portion for receiving one of said articles, and means for uniformly illuminating said articles while in position against said screen comprising a plurality of lamps at each side of said article.

49. A machine of the character described comprising a framework, a plurality of article carriers, a support for said carriers, said carriers being mounted on said framework to rotate in a horizontal plane, each of said article carriers comprising a body portion and a normally horizontally extending article holder, the body portion of each of said carriers being mounted to turn independently about a vertical axis and said article holder being tiltable about a horizontal axis, and means for holding said article holders in horizontal position.

50. A machine of the character described comprising a framework, a plurality of article carriers, each of said article carriers comprising a body portion and a normally horizontally extending article holder, the body portion of each of said carriers being mounted to turn independently about a vertical axis and said article holder being tiltable about a horizontal axis, and means for holding said article holders in horizontal position.

51. A machine of the character described comprising a framework, a plurality of article carriers movable in a fixed path relative thereto, said article carriers each comprising an article holder mounted to swing about a horizontal pivot, means for normally maintaining said holder in a horizontal position comprising a supporting member extending alongside the path of movement of said carriers, and means on said carriers engaging said member.

52. A machine of the character described comprising a framework, a plurality of article carriers movable in a fixed path relative thereto, said article carriers each comprising a supporting member on said framework extending substantially parallel to the path of movement of said carriers, and means on said carriers engaging said member.

53. A machine of the character described comprising a framework, a plurality of article carriers movable in a fixed path relative thereto, said article carriers each comprising an article holder overbalanced to swing about a horizontal pivot, means for normally maintaining said holder in a horizontal position comprising a rib on said framework extending substantially parallel to the path of movement of said carriers, and a member on each of said holders bearing against said rib to maintain said holder in horizontal position.

54. A machine of the character described

comprising a framework, a plurality of article carriers movable in a fixed path relative thereto, said article carriers each comprising an article holder overbalanced to swing about a horizontal pivot, means for normally maintaining said holder in a horizontal position comprising a rib on said framework extending substantially parallel to the path of movement of said carriers, and a member on each of said holders bearing against said rib to maintain said holder in horizontal position, said rib being interrupted, whereby said holders will tilt to article discharging position.

55. A machine of the character described comprising a framework, a plurality of article carriers movable in a fixed path relative thereto, said article carriers each comprising an article holder overbalanced to swing about a horizontal pivot, means for normally maintaining said holder in a horizontal position comprising a rib on said framework extending substantially parallel to the path of movement of said carriers, and a member on each of said holders bearing against said rib to maintain said holder in horizontal position, said rib being provided with a plurality of gaps therein, movable means for closing said gaps and means for actuating a selected one of said means to open one of said gaps, whereupon said holders will tilt to article discharging position.

56. A machine of the character described comprising a framework, a plurality of article carriers mounted to move in a fixed path relative thereto, said article carriers each comprising an article holder mounted to swing about a horizontal pivot, said holders being overbalanced so as to have a tendency to tilt to article discharging position, and being provided with a depending portion provided with a roller, a track on said framework with which said roller engages to maintain said holder in horizontal article carrying position, said track being provided with spaced gaps, means normally closing said gaps and means for actuating any one of said means to open a selected gap to dump an article carrier at a selected point along the path of movement thereof.

57. A machine of the character described comprising a framework, a selecting device, a plurality of article carriers mounted to move in a fixed path relative to said framework, a plurality of sorting stations along the path of movement of said carriers, said article carriers comprising an article holder mounted to swing about a horizontal pivot, said holders being overbalanced so as to have a tendency to tilt to article discharging position and being provided with a depending portion provided with a roller, a track on said framework with the side face of which said roller engages to maintain said holder in horizontal article carrying position, said track being provided with gaps at said sorting stations, means normally closing said gaps, and means controlled by said selecting device for actuating a selected one of said means to dump an article carrier at a selected sorting station.

58. A machine of the character described comprising a framework, a selecting device, a plurality of article carriers mounted to move in a fixed path relative to said framework, a plurality of sorting stations along the path of movement of said carriers, said article carriers comprising an article holder mounted to swing about a horizontal pivot, said holders being overbalanced so as to have a tendency to tilt to article discharging position and being provided with a depending portion provided with a roller, a track on said framework with the side face of which said roller engages to maintain said holder in horizontal article carrying position, said track being provided with gaps at said sorting stations, pivoted switch members normally closing said gaps, and means controlled by said selecting device for actuating a selected one of said switches to dump an article carrier at a selected sorting station.

59. A machine of the character described comprising a framework, a selecting device, a plurality of article carriers mounted to move in a fixed path relative to said framework, a plurality of sorting stations along the path of movement of said carriers, said article carriers comprising an article holder mounted to swing about a horizontal pivot, said holders being overbalanced so as to have a tendency to tilt to article discharging position and being provided with a depending portion provided with a roller, a track on said framework with the side face of which said roller engages to maintain said holder in horizontal article carrying position, said track being provided with gaps at said sorting station, pivoted switch members normally closing said gaps, and means associated with each of said article carriers and controlled by said selecting device for actuating a selected one of said switches to dump the article carrier with which said means is associated at a selected sorting station.

60. A machine of the character described comprising a framework, a plurality of article carriers mounted in a circular series on said framework to rotate in a step by step movement about a common center, said article carriers each comprising an article holder mounted to swing about a horizontal pivot, said holders being overbalanced so as to have a tendency to tilt to article discharging position and being provided with a depending portion provided with a roller,

an arcuate track on said framework with which said roller engages to maintain said holder in horizontal article carrying position, said track being provided with gaps, means for normally closing said gaps and means for actuating any one of said means to dump an article carrier at a selected point along the path of movement thereof.

61. A machine of the character described comprising a framework, a selecting device, a plurality of article carriers mounted in a circular series on said framework, to rotate in a step by step movement about a common center, a plurality of sorting stations along the path of movement of said carriers, said carriers moving the distance from one sorting station to the adjoining sorting station with each movement of said carriers, said article carriers comprising an article holder mounted to swing about a horizontal axis, said holders being overbalanced so as to have a tendency to tilt to article discharging position, and being provided with a depending portion provided with a roller, an arcuate track curved concentric with the center of rotation of said carriers, said rollers engaging the inner face of said track, said track being provided with pivoted switch members normally closing said gaps, and means controlled by said selecting device for actuating a selected one of said switches to dump an article at a selected sorting station.

62. A machine of the character described comprising a framework, a selecting device, a plurality of article carriers mounted in a circular series on said framework to rotate in a step by step movement about a common center, a plurality of sorting stations along the path of movement of said carriers, said carriers moving the distance from one sorting station to the adjoining sorting station with each movement of said carriers, said article carriers comprising an article holder mounted to swing about a horizontal axis, said holders being overbalanced so as to have a tendency to tilt to article discharging position, and being provided with a depending portion provided with a roller, an arcuate track curved concentric with the center of rotation of said carriers, said rollers engaging the inner face of said track, said track being provided with pivoted switch members normally closing said gap, and means associated with each of said article carriers and controlled by said selecting device for actuating a selected one of said switches to dump the article carrier with which said means is associated at a selected sorting station.

63. A machine of the character described comprising a framework, a selecting device, a plurality of article carriers mounted in a circular series on said framework, to rotate in a step by step movement about a common center, a plurality of sorting stations along the path of movement of said carriers, said carriers moving the distance from one sorting station to the adjoining sorting station with each movement of said carriers, said article carriers comprising an article holder mounted to swing about a horizontal axis, said holders being overbalanced so as to have a tendency to tilt to article discharging position, and being provided with a depending portion provided with a roller, an arcuate track curved concentric with the center of rotation of said carriers, said rollers engaging the inner face of said track, said track being provided with pivoted switch members normally closing said gaps, a plurality of members each provided with radially spaced vertically extending pins, each of said pins being adapted to actuate one of said switches, and means controlled by said selecting device for projecting any one of said pins in accordance with the selection of said selecting device.

64. A machine of the character described comprising a framework, a selecting device, a plurality of article carriers mounted in a circular series on said framework, to rotate in a step by step movement about a common center, a plurality of sorting stations along the path of movement of said carriers, said carriers moving the distance from one sorting station to the adjoining sorting station with each movement of said carriers, said article carriers comprising an article holder mounted to swing about a horizontal axis, said holders being overbalanced so as to have a tendency to tilt to article discharging position, and being provided with a depending portion provided with a roller, an arcuate track curved concentric with the center of rotation of said carriers, said rollers engaging the inner face of said track, said track being provided with pivoted switch members normally closing said gaps, means controlled by said selecting device for actuating a selected one of said switches to dump an article at a selected sorting station, said switch members having laterally extending arms, and a plurality of members each provided with radially spaced vertically extending pins, each of said pins being adapted to engage one of said arms to actuate one of said switches and means controlled by said selecting device for projecting any one of said pins in accordance with the selection of said selecting device, to dump an article at a selected sorting station.

65. A machine of the character described comprising a framework, a selecting device, a plurality of article carriers mounted in a circular series on said framework, to rotate in a step by step movement about a common center, a plurality of sorting stations along the path of movement of said carriers, said carriers moving the distance from one sort-

ing station to the adjoining sorting station with each movement of said carriers, said article carriers comprising an article holder mounted to swing about a horizontal axis, said holders being overbalanced so as to have a tendency to tilt to article discharging position, and being provided with a depending portion provided with a roller, an arcuate track curved concentric with the center of rotation of said carriers, said rollers engaging the inner face of said track, said track being provided with pivoted switch members normally closing said gaps, means controlled by said selecting device for actuating a selected one of said switches to dump an article at a selected sorting station, said switch members having laterally extending arms, said arms being of varying lengths and being arranged in stepped relation about said machine, and a plurality of members each provided with radially spaced vertically extending stepped pins, each of said pins being adapted to engage one of said arms to actuate one of said switches and means controlled by said selecting device for projecting any one of said pins in accordance with the selection of said selecting device, to dump an article at a selected sorting station.

66. A machine of the character described comprising a framework, a selecting device, a plurality of article carriers mounted in a circular series on said framework, to rotate in a step by step movement about a common center, a plurality of sorting stations along the path of movement of said carriers, said carriers moving the distance from one sorting station to the adjoining sorting station with each movement of said carriers, said article carriers comprising an article holder mounted to swing about a horizontal axis, said holders being overbalanced so as to have a tendency to tilt to article discharging position, and being provided with a depending portion provided with a roller, an arcuate track curved concentric with the center of rotation of said carriers, said rollers engaging the inner face of said track, said track being provided with pivoted switch members normally closing said gap, means controlled by said selecting device for actuating a selected one of said switches to dump an article at a selected sorting station, said switch members having laterally extending arms, said arms being of varying lengths and being arranged in stepped relation about said machine, and a plurality of members each provided with radially spaced vertically extending stepped pins, each of said pins being adapted to engage one of said arms to actuate one of said switches and means controlled by said selecting device for projecting any one of said pins in accordance with the selection of said selecting device, to dump an article at a selected sorting station, said means comprising electro-magnetically operated plungers, there being one of said plungers for each of said pins.

67. A machine of the character described comprising a framework, a selecting device, a plurality of article carriers mounted in a circular series on said framework, to rotate in a step by step movement about a common center, a plurality of sorting stations along the path of movement of said carriers, said carriers moving the distance from one sorting station to the adjoining sorting station with each movement of said carriers, said article carriers comprising an article holder mounted to swing about a horizontal axis, said holders being overbalanced so as to have a tendency to tilt to article discharging position, and being provided with a depending portion provided with a roller, an arcuate track curved concentric with the center of rotation of said carriers, said rollers engaging the inner face of said track, said track being provided with pivoted switch members normally closing said gap, means controlled by said selecting device for actuating a selected one of said switches to dump an article at a selected sorting station, said switch members having laterally extending arms, said arms being of varying lengths and being arranged in stepped relation about said machine, and a plurality of members each provided with radially spaced vertically extending stepped pins, each of said pins being adapted to engage one of said arms to actuate one of said switches and means controlled by said selecting device for projecting any one of said pins in accordance with the selection of said selecting device, to dump an article at a selected sorting station, there being one of said members of each of said carriers.

68. A machine of the character described comprising a framework, a selecting device, a plurality of article carriers mounted in a circular series on said framework, to rotate in a step by step movement about a common center, a plurality of sorting stations along the path of movement of said carriers, said carriers moving the distance from one sorting station to the adjoining sorting station with each movement of said carriers, said article carriers comprising an article holder mounted to swing about a horizontal axis, said holders being overbalanced so as to have a tendency to tilt to article discharging position, and being provided with a depending portion provided with a roller, an arcuate track curved concentric with the center of rotation of said carriers, said rollers engaging the inner face of said track, said track being provided with pivoted switch members normally closing said gap, means controlled by said selecting device for actuating a selected one of said switches to dump

an article at a selected sorting station, said switch members having laterally extending arms, said arms being of varying lengths and being arranged in stepped relation about said machine, and a plurality of members each provided with radially spaced vertically extending stepped pins, each of said pins being adapted to engage one of said arms to actuate one of said switches and means controlled by said selecting device for projecting any one of said pins in accordance with the selection of said selecting device, to dump an article at a selected sorting station, said framework having means for returning said pins to retracted position.

69. A machine of the character described comprising a framework, a selecting device, a plurality of article carriers mounted in a circular series on said framework, to rotate in a step by step movement about a common center, a plurality of sorting stations along the path of movement of said carriers, said carriers moving the distance from one sorting station to the adjoining sorting station with each movement of said carriers, said article carriers comprising an article holder mounted to swing about a horizontal axis, said holders being overbalanced so as to have a tendency to tilt to article discharging position and being provided with a depending portion provided with a roller, an arcuate track curved concentric with the center of rotation of said carriers, said rollers engaging the inner face of said track, said track being provided with pivoted switch members normally closing said gaps, means controlled by said selecting device for actuating a selected one of said switches to dump an article at a selected sorting station, said switch members having laterally extending arms, said arms being of varying lengths and being arranged in stepped relation about said machine, and a plurality of members each provided with radially spaced vertically extending stepped pins, each of said pins being adapted to engage one of said arms to actuate one of said switches and means controlled by said selecting device for projecting any one of said pins in accordance with the selection of said selecting device, to dump an article at a selected sorting station, said means comprising electro-magnetically operated plungers, there being one of said plungers for each of said pins, said members each having means in advance of said pins for returning said plungers to retracted position.

70. A machine of the character described comprising a framework, a selecting device, a plurality of article carriers mounted in a circular series on said framework, to rotate in a step by step movement about a common center, a plurality of sorting stations along the path of movement of said carriers, said carriers moving the distance from one sorting station to the adjoining sorting station with each movement of said carriers, said article carriers comprising an article holder mounted to swing about a horizontal axis, said holders being overbalanced so as to have a tendency to tilt to article discharging position and being provided with a depending portion provided with a roller, an arcuate track curved concentric with the center of rotation of said carriers, said rollers engaging the inner face of said track, said track being provided with pivoted switch members normally closing said gaps, means controlled by said selecting device for actuating a selected one of said switches to dump an article at a selected sorting station, said switch members having laterally extending arms, said arms being of varying lengths and being arranged in stepped relation about said machine, and a plurality of members each provided with radially spaced vertically extending stepped pins, each of said pins being adapted to engage one of said arms to actuate one of said switches and means controlled by said selecting device for projecting any one of said pins in accordance with the selection of said selecting device, to dump an article at a selected sorting station, said pins being provided with means for holding said pins in projected position, and said framework having means for returning said pins to retracted position.

71. A machine of the character described comprising a framework, a plurality of article carriers mounted thereon to move in a predetermined path relative thereto, said carriers being provided with article holders overbalanced so as to tend to move to dumping position, a track extending substantially parallel to the path of movement of said carriers, said carriers having means engaging said track to hold the same in article carrying position, and pivoted switches in said track for dumping said carriers at spaced points, said switches being provided with laterally extending arms of graduated length adapted to engage means on said article carriers to actuate said switches.

72. A machine of the character described comprising a framework, a plurality of article carriers mounted thereon to move in a predetermined path relative thereto, said carriers being provided with article holders overbalanced so as to tend to move to dumping position, a track extending substantially parallel to the path of movement of said carriers, said carriers having means engaging said track to hold the same in article carrying position, and pivoted switches in said track for dumping said carriers at spaced points, said switches being provided with laterally extending stepped arms adapt-

ed to engage means on said article carriers to actuate said switches.

73. A machine of the character described comprising a framework, a plurality of article carriers mounted thereon to move in a predetermined path relative thereto, said carriers being provided with article holders overbalanced so as to tend to move to dumping position, a track extending substantially parallel to the path of movement of said carriers, said carriers having means engaging said track to hold the same in article carrying position, said track having a gap therein to provide a positive dumping position for said carriers and having an inclined guide portion at the beginning thereof to guide said means into position to hold said carriers in article carrying position.

74. In a device of the character described a rotating support and article carriers mounted on said support in spaced relation, said article carriers each comprising a main body portion pivoted to turn independently about a vertical axis relative to said support and an article holder pivoted on said main body portion to turn about a horizontal axis.

75. In a device of the character described a rotating support and article carriers mounted on said support in spaced relation, said article carriers each comprising a main body portion pivoted to turn about a vertical axis relative to said support and an article holder pivoted on said main body portion to turn about a horizontal axis, said article holder being overbalanced.

76. In a device of the character described a rotating support and article carriers mounted on said support in spaced relation, said article carriers each comprising a main body portion pivoted to turn about a vertical axis relative to said support and an article holder pivoted on said main body portion to turn about a horizontal axis, said article holder being overbalanced, and having a depending portion provided with means engaging a stationary supporting member for maintaining said holder in article carrying position.

77. A machine of the character described comprising a framework, a plurality of article carriers mounted to rotate on said framework in a horizontal plane, a plurality of concentrically curved tracks mounted on said framework, said carriers each being mounted on a vertical pivot and being provided with a member spaced from said pivot adapted to operate in any one of said tracks whereby said carrier is adapted to assume a plurality of angular positions, and means for directing said member into any one of said tracks.

78. A machine of the character described comprising a framework, a selector, a plurality of article carriers mounted to rotate on said framework in a horizontal plane, a plurality of concentrically curved tracks mounted on said framework, said carriers each being mounted on a vertical pivot and being provided with a member spaced from said pivot adapted to operate in any one of said tracks whereby said carrier is adapted to assume a plurality of angular positions, and means controlled by said selector for directing said member into any one of said tracks, said means comprising a switch member, and selectively controlled stop members for holding said switch in a selected position.

79. A machine of the character described comprising a framework, a selector, a plurality of article carriers mounted to rotate on said framework in a horizontal plane, a plurality of concentrically curved tracks mounted on said framework, said carriers each being mounted on a vertical pivot and being provided with a member spaced from said pivot adapted to operate in any one of said tracks whereby said carrier is adapted to assume a plurality of angular positions, and means controlled by said selector for directing said member into any one of said tracks, said means comprising a switch member, movable about a vertical pivot, a cam on said machine for moving said switch in one direction, a spring for moving said switch in the opposite direction and selectively controlled stop members for holding said switch in a selected position.

80. A machine of the character described comprising a hopper, a selecting device, a member for receiving articles from said hopper, moving said articles into cooperative relation with said selecting device and maintaining said articles in said relation for a limited period of time, article carriers having a step by step movement relative to said member, and means for removing said articles from said member and discharging the same onto one of said carriers while said carrier is stationary.

81. A machine of the character described comprising a hopper, a selecting device, a member for receiving articles from said hopper, moving said articles into cooperative relation with said selecting device and maintaining said articles in said relation for a limited period of time, article carriers having a movement relative to said member, means for removing said articles from said member and discharging the same onto one of said carriers, and means for halting the movement of said carrier as said article is discharged thereon.

82. A machine of the character described comprising a framework, a selector, a plurality of article carriers mounted to rotate on said framework in a horizontal plane, a plurality of concentrically curved tracks mounted on said framework, said carriers each being mounted on a vertical pivot and being provided with a member spaced from

said pivot adapted to operate in any one of said tracks whereby said carrier is adapted to assume a plurality of angular positions, and means controlled by said selector for directing said member into any one of said tracks, said means comprising a switch member, and selectively controlled stop members for holding said switch in a selected position, said carriers being held stationary while said switch moves into selected position.

83. A machine of the character described comprising a framework, a plurality of article carriers mounted to rotate on said framework in a horizontal plane, a plurality of concentrically curved tracks mounted on said framework, said carriers each being mounted on a vertical pivot and being provided with a member spaced from said pivot adapted to operate in any one of said tracks whereby said carrier is adapted to assume a plurality of angular positions, and means for directing said member into any one of said tracks, said framework being provided with means for preventing discharge of the article from the carrier due to the swinging movement thereof.

84. A machine of the character described comprising a framework, a plurality of article carriers mounted to rotate on said framework in a horizontal plane, a plurality of concentrically curved tracks mounted on said framework, said carriers each being mounted on a vertical pivot and being provided with a member spaced from said pivot adapted to operate in any one of said tracks whereby said carrier is adapted to assume a plurality of angular positions, and means for directing said member into any one of said tracks, said framework being provided with a guard member for preventing discharge of the article from the carrier due to the swinging movement thereof.

85. A machine of the character described comprising a framework, a plurality of article carriers mounted to rotate on said framework in a horizontal plane, a plurality of concentrically curved tracks mounted on said framework, said carriers each being mounted on a vertical pivot and being provided with a member spaced from said pivot adapted to operate in any one of said tracks whereby said carrier is adapted to assume a plurality of angular positions, and means for directing said member into any one of said tracks, said framework being provided with an overhanging guard plate for preventing discharge of the article from the carrier due to the swinging movement thereof.

86. A machine of the character described having a hopper for receiving articles to be sorted, a selecting device, means for moving said articles successively one at a time into the range of said selecting device, means for carrying said articles away from said selecting device after said articles have influenced said selecting device, a plurality of receptacles and means set while said article is influencing said selecting device whereby said carrying means is actuated to discharge said articles into said receptacles in accordance with the selections of said selecting device.

87. A machine of the character described having a hopper for receiving articles to be sorted, a photometric selecting device, means for moving said articles successively one at a time into the range of said selecting device, means for carrying said articles away from said selecting device after said articles have influenced said selecting device, a plurality of receptacles and means set while said article is influencing said selecting device whereby said carrying means is actuated to discharge said articles into said receptacles in accordance with the selections of said selecting device to collect all the articles of the same color at one point.

In witness whereof I hereunto subscribe my name this 19th day of September A. D., 1921.

LESTER L. LADD.