Dec. 26, 1950 F. RASMUSSEN 2,535,866

ARTICLE DIVIDER AND DELIVERING DEVICE

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FIG. 1

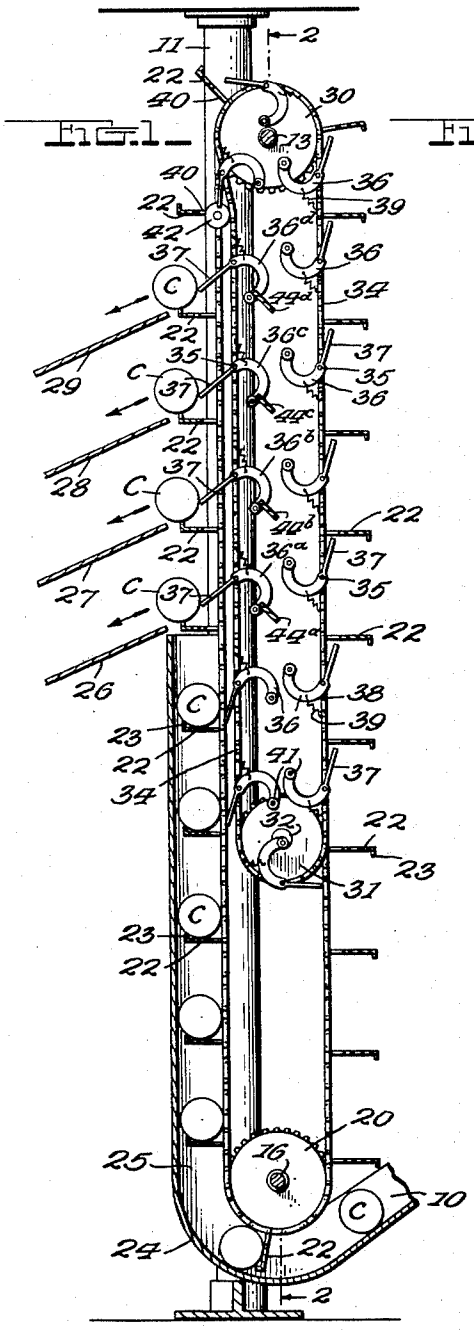
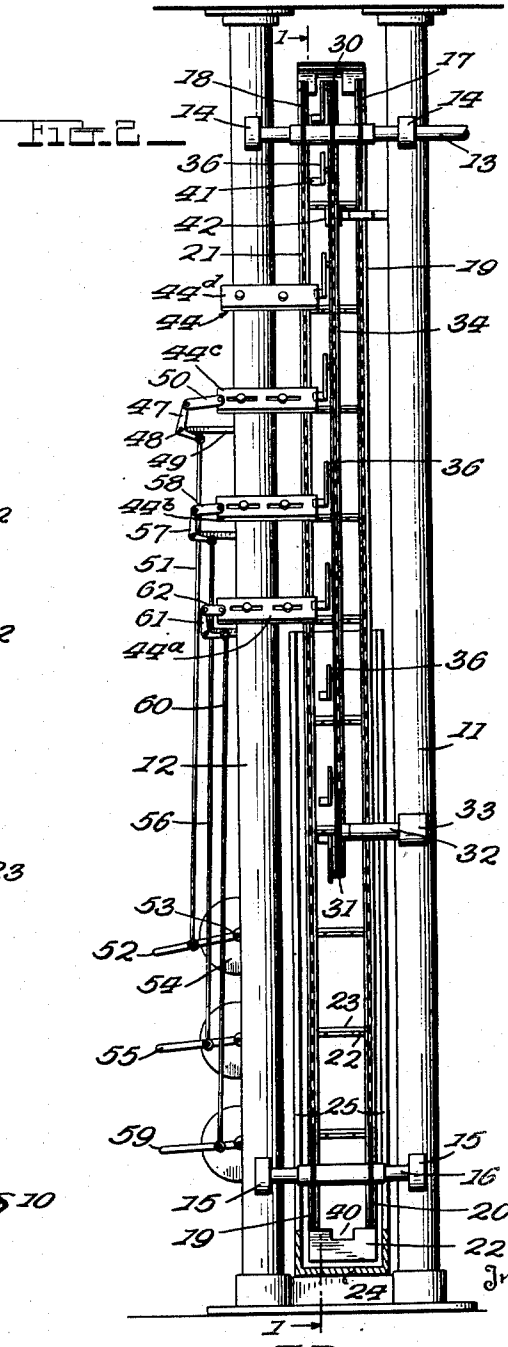


FIG. 2



Inventor

F. Rasmussen,

By Mason, Porter, Diller & Stewart

Attys.

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FIG. 3

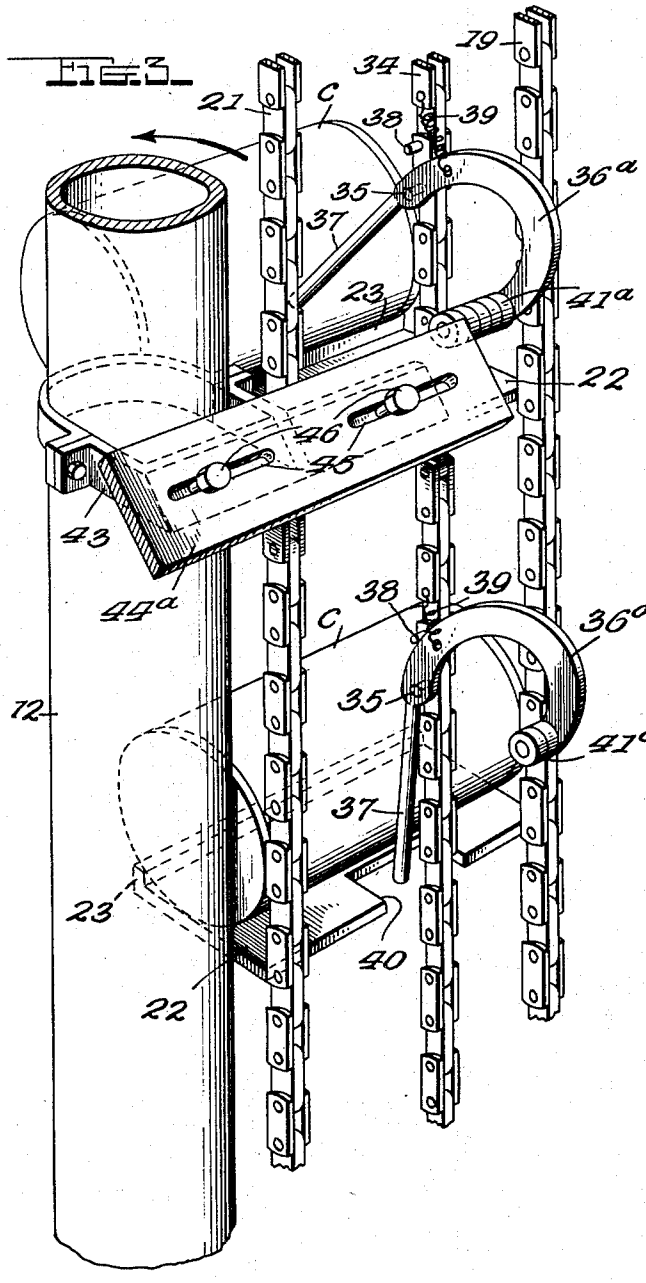


FIG. 4

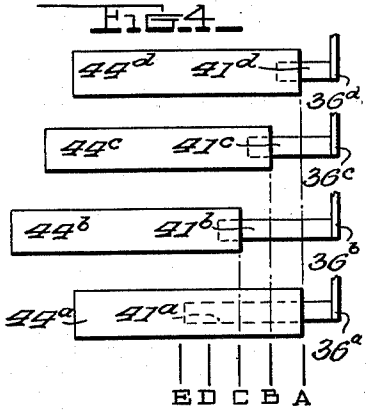


FIG. 5

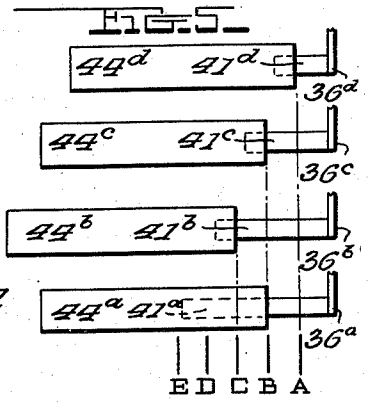
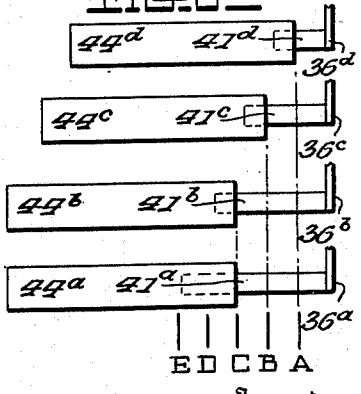


FIG. 6



Inventor

F. Rasmussen,

By Mason, Porter, Dillon & Stewart

attys.

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UNITED STATES PATENT OFFICE

2,535,866

ARTICLE DIVIDER AND DELIVERING DEVICE

Fred Rasmussen, Seattle, Wash., assignor to Continental Can Company, Inc., New York, N. Y., a corporation of New York

Application June 13, 1949, Serial No. 98,689

7 Claims. (Cl. 198—66)

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The invention relates to new and useful improvements in an article divider and deliverer for selectively discharging articles from a single conveyor onto a group of associated conveyors. The improved divider is particularly adapted for use in can manufacturing plants and in canneries and will, therefore, be described and illustrated in connection with the handling of cans, although it is to be understood that the invention may be used for many other purposes.

An object of the invention is to provide a can divider wherein cans are received from a single conveyor line and selectively discharged onto one or more of a group of conveyor chutes.

A further object of the invention is to provide a divider of the above type wherein the operator may quickly change the selective control of the discharge of cans onto the chutes.

A still further object of the invention is to provide a divider of the above type wherein the cans are delivered, one after another, onto carrying devices mounted at spaced intervals on an elevator with which is associated a plurality of can receiving chutes arranged one above another, and wherein means is provided for selectively discharging the cans from the elevator into the chutes.

A still further object of the invention is to provide a divider of the above type wherein the means for selectively discharging the cans from the elevator includes devices traveling with the elevator and spaced to conform to the carriers thereon and a shiftable stationary cam plate associated with each chute for selectively operating the can discharge devices for delivering cans into the chutes.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawings which show by way of illustration the invention as applied to the handling of cans:

Figure 1 is a view on the line 1—1 of Figure 2;

Figure 2 is a sectional view on the line 2—2 of Figure 1;

Figure 3 is a perspective view showing one of the columns, the elevator for conveying the cans, the discharge devices for discharging the cans from the elevator and one of the control plates for selectively operating on the discharge devices;

Figure 4 is a diagrammatic view showing a portion of a discharge device and the operating rods carried thereby and also showing the cam plates in certain set positions for selectively operating said discharge devices, said plates being

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set so as to deliver all of the cans onto the lowermost chute of the group;

Figure 5 is a view similar to Figure 4, but showing the cam plate set so as to deliver seventy-five percent of the cans onto the lowermost chute and twenty-five percent of the cans onto the uppermost chute; and

Figure 6 is a similar view with the cam plate shifted so as to deliver fifty percent of the cans onto the lowermost chutes and twenty-five percent of the cans onto each of the uppermost chutes.

The invention has to do with an article dividing and deliverer device which is capable of many uses. It is particularly adapted for use in a can plant or in a cannery for the handling of cans, either empty cans or filled cans. The invention has, therefore, been illustrated as embodied in a can handling device which receives cans one after another from a single can conveying line and delivers the cans selectively onto one or more conveying chutes or can lines.

The cans are fed into the divider from a can conveyor with which is associated a suitable form of timing mechanism so that the cans are delivered in spaced relation one after another to the can divider. Only a portion of the can conveying means which delivers cans to the divider is indicated at 10 in the drawings. The cans are indicated at C and as shown in this figure, one can is just passed onto the elevator of the divider. The can divider, as illustrated, includes two columns 11 and 12, which are spaced from each other. Mounted in suitable bearings near the upper ends of the columns is a main operating shaft 13. The bearings for the shaft are indicated at 14, 14. Mounted in bearings 15, 15 at the lower end of the columns is a shaft 16. Mounted on the shaft 13 is a pair of sprocket wheels 17 and 18. An endless conveyor chain 19 runs over the sprocket wheel 17 on the shaft 13 and over a similar sprocket wheel 20 mounted on the shaft 16 at the lower end of the columns.

There is also a conveyor chain 21 which runs over the sprocket 18 and over a similar sprocket 19 on the shaft 16. Mounted at spaced intervals on these conveyor chains are can supporting plates 22. These can supporting plates have upturned ends 23 so that when a can C is placed on an upwardly traveling can support 22, the upturned end will hold the can in position on the support and at the same time this upturned end is of sufficient height so that the can can be forcibly rolled off the support 22 over the upturned end 23.

There is a guide plate 24 and side guide members 25 which assist in retaining the cans on the supports in their upward travel until they reach the delivering chutes which are indicated at 26, 27, 28, and 29. In the present arrangement there are four chutes. These may be varied in number, as will be hereinafter more fully pointed out. The conveyor chains 19 and 21, together with the can supporting plates 22 form what is referred to as an elevator which receives the cans one after another and carry them upwardly to the receiving ends of the conveyor chutes which are arranged one above the other.

Mounted on the shaft 13 midway between the sprocket wheels 17 and 18 is a sprocket wheel 30. There is a sprocket wheel 31 mounted on a shaft 32 which in turn is supported in a bracket 33 carried by the column 11. A link chain 34 runs over these sprocket wheels 30 and 31, and the discharge ejecting devices for forcing a can off from a supporting plate on the elevator are carried by this link chain. The can discharge device is pivoted to one of the links of the chain as indicated at 35 (see Fig. 3). The discharge device includes a U-shaped member 36 projecting from one side of the pivot and a can engaging rod 37 projecting from the other side of the pivot. This rod and the U-shaped member are rigidly connected. Mounted on the link chain is a stop pin 38 and a spring 39 turns this discharge device on the pivot so that it rests against the stop finger when it is not effective for discharging a can. Each can support is cut away as indicated at 40 in Figure 3 so as to clear the idler 42, hereinafter described. On the outer end of the U-shaped discharge device is a projecting member 41. This projecting member, as illustrated, includes a supporting stud and a series of rollers mounted thereon. These discharge devices for discharging the cans from the can supports on the elevator travel in time with the elevator and as noted there is a discharge device associated with each can support. When there are four chutes as indicated in Figure 1 then the can discharge devices are arranged in groups of four, the only difference between the discharge devices in the groups is the length of this projecting member 41, on the can discharge device.

Viewing Figure 1, we will assume that the four can discharge devices opposite the chutes is one of the groups of four. There are three other groups of four on this link chain 34 and we will number these four discharge devices 36^a, 36^b, 36^c and 36^d respectively.

Referring to Figure 4, it is noted that the member 41 of the discharge device 36^a is longer than the member 41 of the discharge device 36^b. Likewise, the member 41 of the discharge device 36^c is shorter than that carried by 36^b and the member 41 of the discharge device 36^d is shorter than any of the others.

To aid in an understanding of the purpose of the different lengths of the members 41, we are numbering in Figure 4 these members 41^a, 41^b, 41^c and 41^d respectively.

There is an idler 42 over which the link chain 34 runs and this will cause the upwardly moving portion of the link chain to travel in a line parallel with the conveyor chains of the elevator, but slightly spaced away therefrom. This link chain 34 running over the same size driving sprocket at the upper end, as the driving sprocket for the elevator, will cause the link chain to move in time with the elevator so that each one of these discharging devices remains in a fixed relation to the can support on the elevator with which it is associated.

Mounted on a bracket 43 carried by the column 12 is a cam plate 44. The cam plate is provided with slots 45, 45 extending longitudinally of the plate. Headed studs 46, 46 pass through the slots and are threaded into the bracket so as to support the plate on the bracket while permitting endwise movement of the plate. There are four of these plates. The uppermost plate 44 does not have the slots but is set in a fixed position on its supporting bracket. To aid in the understanding of the operation of these cam plates they are numbered in Figure 2 and in Figures 4 to 6, 44^a, 44^b, 44^c and 44^d respectively.

The cam plates with the slots are shiftable endwise independently. Associated with the cam plate 44^c is a rock lever 47 pivoted at 48 to a supporting bracket 49 carried by the column 12. This rock lever is connected by a link 50 to the plate 44^c. Pivoted to the other end of the rock lever 47 is a rod 51 which is connected to a hand operated lever 52 at its lower end and this hand operated lever is pivoted at 53 and has associated with it the sector holding plate 54. There is a similar hand lever 55 connected by a rod 56 to a bell crank 57 which in turn is connected by a link 58 to the control plate 44^b. There is also another similar lever 59 connected to a rod 60 which in turn is connected to a bell crank 61 and through the link 62 to the control plate 44^a. There is a control plate 44 associated with each chute and it has a fixed relation thereto. These control plates are arranged in an inclined position and lie in the path of travel of certain of the projecting members 41 carried by the discharge devices.

As viewed in Figure 3, the discharge device at the upper end is 36^a of the group and it carries the longest pin member 41^a. The end of this pin contacts with the under inclined face of the plate 44^a and will oscillate the discharge device in a clockwise direction and this will cause the rod 37 to engage the can and force the same off from the support into the lowermost chute 26. Following this discharge member 36^a is a discharge member 36^d which carries the shortest control pin 41^d. With the plate 44^a set as shown in Figure 3, then it is obvious that this pin 41^d would not contact the plate and would not be operated to discharge the can on the support associated with this discharge device. By shifting this cam plate, the cans may be selectively discharged onto the chutes.

In Figure 4 these cam plates are shifted so that the cam plate 44^a lies in a position where each one of the control pins 41^a, 41^b, 41^c and 41^d will contact the same and therefore all of the discharge devices will be operated as they pass one after another on this plate 44^a and one hundred percent of the cans will be discharged onto the chute 26.

When the plates are shifted to the position shown in Figure 5, then the pins 41^a, 41^b and 41^c will each, one after the other, contact the control plate 44^a but the pin 41^d will pass the plates 44^a, 44^b and 44^c and will contact with the plate 44^d. Under this arrangement seventy-five percent of the cans will be delivered onto the chute 26 and twenty-five percent will be delivered onto the chute 29. If the plates are shifted to the position shown in Figure 6, then the pins 41^a and 41^b will contact with the plates 44^a and be operated thereby, while the control pin 41^c will pass both the plates 44^a and 44^b and be contacted by the plate 44^c. The pin 41^d will pass all the other plates

and will contact the plate 44d. Under this arrangement fifty percent of the cans will be discharged onto the chute 26, twenty-five percent will be discharged onto the chute 28 and 25 percent will be discharged onto the chute 29. The upper control plate 44d, as noted, is fixed and no control pin can pass the same without being operated thereby and, therefore, no cans can pass the upper chute 29 and pass around the sprockets at the upper end and cause a jam.

Let us assume that the can divider is installed in a cannery and receives the cans from one high speed canning line and it is desired to deliver the cans to four continuously operating cookers and when these cookers are operated normally it is desired that twenty-five percent of the cans shall be delivered to each cooker, then the plates would be set as shown in Figure 2, and these control plates will operate one after another upon the discharge devices so that one out of each four cans will be delivered to the respective chutes.

Let us suppose again, that for some reason one of the cookers is shut down temporarily and that it is the cooker which is receiving cans from the chute 27, then the control plates would be shifted to the position shown in Figure 6 and the cans which were being discharged onto chute 27 would then be discharged onto chute 26. This does not interfere with the normal discharge of the cans onto chutes 28 and 29 respectively. It will be seen, therefore, that this divider which is under the very quick control of an operator can be so adjusted as to take care of all of the cans coming from the canning line while one of the cookers is being stopped and reconditioned for operation. Let us assume that the output of the cannery is low as to the number of cans and only the cooker associated with the chute 29 is in use. In such a case all that is necessary is to move the shiftable plates 44a, 44b and 44c to the position indicated by the line E, in which case the discharge devices would all pass free of these lower three plates and will contact the upper plate only so that all cans would be discharged into the chute 29. This is one of the many uses which the improved can divider can be employed.

It will be noted that in the illustrated embodiment of the invention there are four chutes and a cam plate associated with each chute. The link chain carries sixteen can discharging devices and they are divided into groups of four, and in each group the control pins on the outer ends of the can discharging devices are all of different lengths.

Preferably, the link chain carries twelve discharge devices. As the digit twelve is a multiple of 2-3-4 and 6, it is obvious that such a basic elevator can be readily adapted to discharge cans at either 2-3-4 or 6 points by simply providing the proper length pins on each discharge device arranged respectively in 6 sets of 2; 4 sets of 3; 3 sets of 4 or 2 sets of 6.

Assuming that a canner requires cans to go to six locations, he would be supplied with an elevator having six outlet chutes, six control plates and a link chain carrying 12 discharge devices divided into two groups. In the event that his production was seasonably reduced, and during this time only four points of discharge were required, the adjustment could quickly be made by removing two of the control plates and changing the length of the pins on four of the discharge devices so that, instead of six pins of each group being progressively longer, the pins on four successive discharge devices would be progressively longer.

It is obvious that many changes may be made in the details of construction and arrangement of parts for adapting the divider for various uses without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. An article divider comprising an article conveyor having at spaced intervals article carrying devices, conveying chutes spaced at intervals along the conveyor for receiving articles from said conveyor, devices independent of the article conveyor traveling in timing with the conveyor for discharging articles from the conveyor into the chutes and cam plates associated with said chutes and operating selectively on said discharge devices for discharging the articles into selective chutes.

2. A can divider comprising an elevator having at spaced intervals can carrying devices, conveying chutes at different levels for receiving cans from said elevator, devices independent of the elevator traveling in timing with the elevator for discharging cans from the elevator into the chutes and cam plates associated with each chute and operating selectively on the discharge devices for discharging the cans into selected chutes.

3. A can divider comprising an elevator having at spaced intervals can carrying devices, conveying chutes at different levels for receiving cans from said elevator, devices independent of the elevator traveling in timing with the elevator for discharging cans from the elevator into the chutes and cam plates associated with each chute and operating selectively on the discharge devices for discharging the cans into selected chutes, and means controlled by the operator for independently shifting certain of said cam plates for rendering the same operative or inoperative and thereby changing the selection of chutes into which the cans are discharged.

4. A can divider comprising an elevator having at spaced intervals can varrying devices, conveying chutes at different levels for receiving cans from said elevator, an endless chain traveling in timing with said elevator and paralleling the path of the elevator as it passes said chute, can discharging devices carried by said chain and positioned in the same spaced relation as the can carriers on the elevator and cam plates associated with each chute and operating selectively on said discharge devices for delivering the cans into selected chutes.

5. A can divider comprising an elevator having at spaced intervals can carrying devices, conveying chutes at different levels for receiving cans from said elevator, an endless chain traveling in timing with said elevator and paralleling the path of the elevator as it passes said chutes, can discharging devices carried by said chain and positioned in the same spaced relation as the can carriers on the elevator and cam plates associated with each chute and operating selectively on said discharge devices for delivering the cans into selected chutes, and means controlled by the operator for independently shifting certain of said cam plates for rendering the same operative or inoperative and thereby changing the selection of chutes into which the cans are discharged.

6. A can divider comprising an elevator having at spaced intervals can carrying devices, conveying chutes at different levels for receiving cans from said elevator, an endless chain traveling in timing with said elevator and paralleling the path of the elevator as it passes said chutes, can discharging devices carried by said chain and posi-

tioned in the same spaced relation as the can carrying devices on the elevator, each can discharging device being pivoted intermediate its ends on said chain and having at one end a rod adapted when operated to push the can from the can support associated therewith into a chute, said discharging device having at its other end a control pin, said discharging devices being divided into groups of the same number as the chutes, the control pins of said devices in a group being of different lengths, and cam plates associated with each chute and operating selectively on said control pins of the discharge devices for discharging cans into selected chutes.

7. A can divider comprising an elevator having at spaced intervals can carrying devices, conveying chutes at different levels for receiving cans from said elevator, an endless chain traveling in timing with said elevator and paralleling the path of the elevator as it passes said chutes, can discharging devices carried by said chain and positioned in the same spaced relation as the can carrying devices on the elevator, each can discharging device being pivoted intermediate its ends on said chain and having at one end a rod adapted when operated to push the can from the can support associated therewith into a chute, said discharging device having at its other end a control pin, said discharge devices being divided into groups of the same number as the chutes, the control pins of said devices in a group being of different lengths, and cam plates associated with each chute and operating selectively on said control pins of the discharge devices for discharging cans into selected chutes, and means controlled by the operator for independently shifting certain of said cam plates for rendering the same operative or inoperative on the control pins and thereby changing the selection of chutes into which the cans are discharged.

FRED RASMUSSEN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
445,611	Ruddell	Feb. 3, 1891
746,247	Baggaley	Dec. 8, 1903
1,467,008	Parker	Sept. 4, 1923
1,856,262	Rebstock	May 3, 1932
2,390,261	Le Roy	Dec. 4, 1945
2,417,753	Hesson	Mar. 18, 1947