May 30, 1939. A. R. THOMPSON 2,160,237

CAN HANDLING APPARATUS

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Fig. 1.

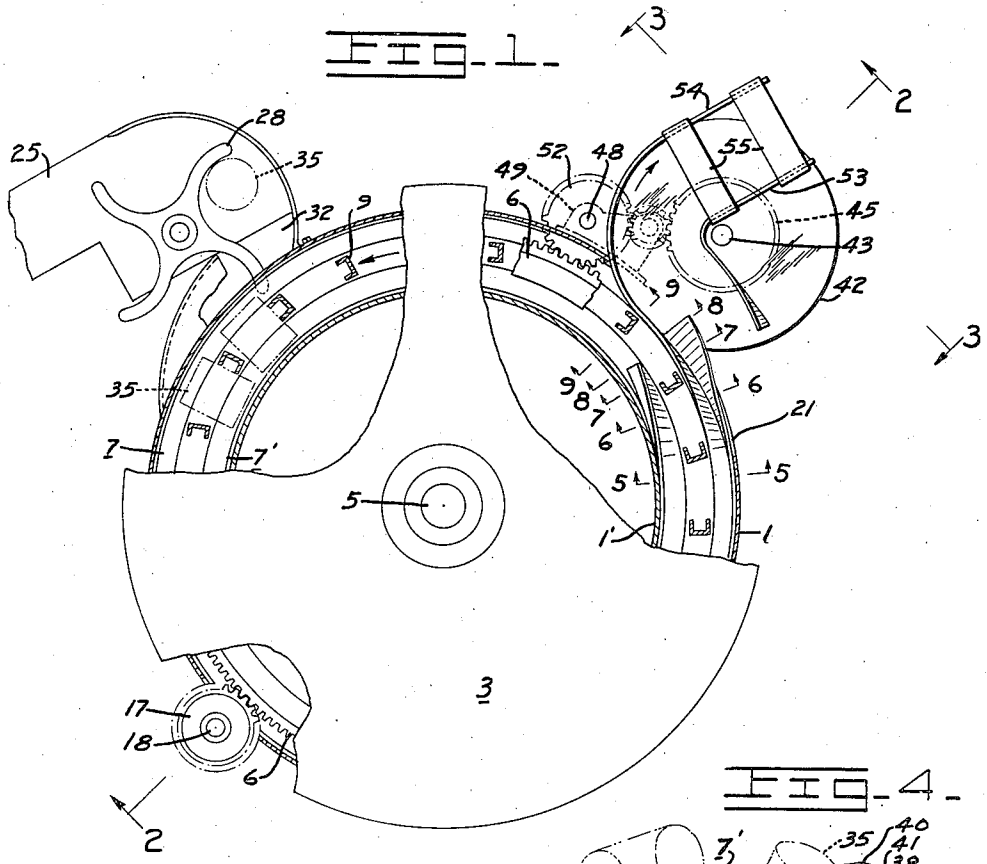


Fig. 4.

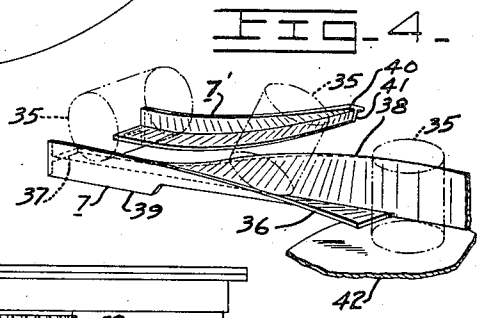
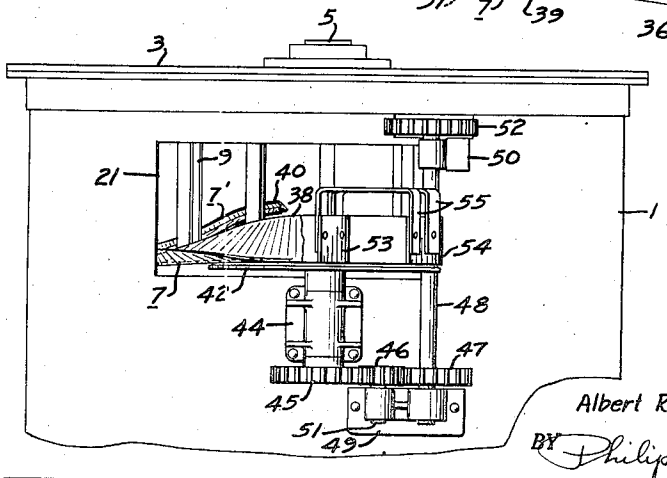


Fig. 3.



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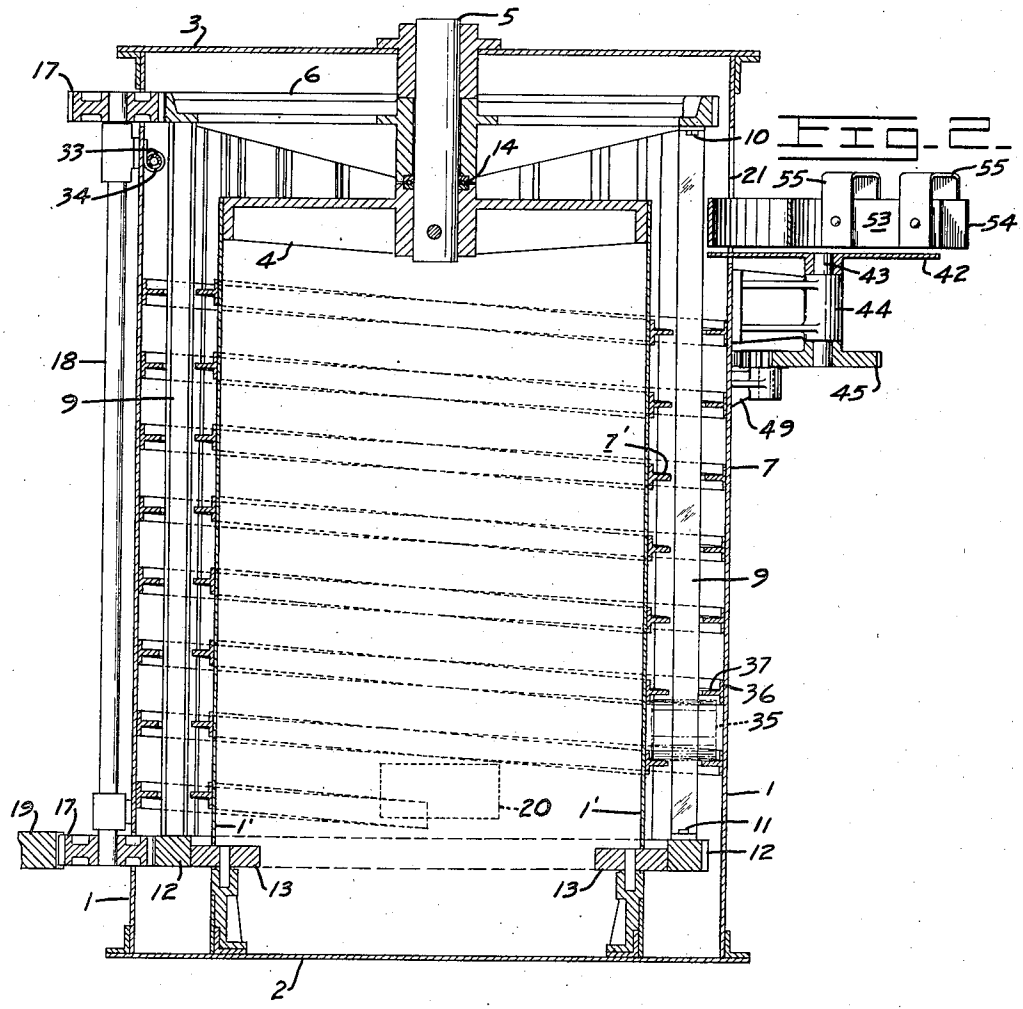


Fig. 2.

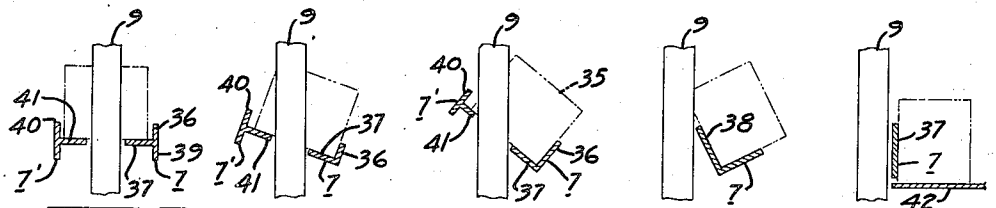


Fig. 5. Fig. 6. Fig. 7. Fig. 8. Fig. 9.

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Patented May 30, 1939

2,160,237

UNITED STATES PATENT OFFICE

2,160,237

CAN HANDLING APPARATUS

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Application July 2, 1938, Serial No. 217,207

12 Claims. (Cl. 198—212)

This invention relates in general to can handling equipment, and is more particularly concerned with the provision of an improved form of can discharge mechanism for use in processing apparatus of the vertical "reel and spiral" type, such, for example, as the cooler illustrated and described in my prior U. S. Letters Patent No. 1,651,912 dated Dec. 6, 1927.

Coolers of the type referred are utilized in the canning industry for cooling the canned goods following the sterilizing operation, and, generally described, are made up of a closed upright cylindrical shell forming a cooling chamber therewithin, through which the cans are advanced along an upwardly trending helical trackway by means of a rotating can propelling reel, while being simultaneously subjected to the action of a cooling medium.

In the cooler disclosed in the patent referred to, the cooled cans are ejected from the apparatus by means of a rotating star wheel which operates to push the cans endwise from the trackway and through a discharge opening in the shell, from which they drop into a discharge chute and roll away to a suitable point of delivery.

While the discharge mechanism referred to has been found to be eminently satisfactory, and numerous coolers employing such mechanism have been and are continuing to give satisfactory performance in commercial practice, it has been found that the speed of operation is somewhat limited in order to allow time for the cans to turn sideways in the discharge chute so that they may roll away.

It is one of the principal objects of the present invention to provide an improved form of can discharge mechanism which permits higher speeds of operation than have heretofore been obtainable.

Another object is to provide a can discharge mechanism adapted to discharge the cans in upright position, in which they are easier to handle and control.

A further object is to provide a can discharge mechanism which is adapted for use with a driven receiving conveyer whereby the cans may be positively conveyed to a suitable point of delivery instead of rolling by gravity.

A still further object is to provide a can discharge mechanism of simplified form, which eliminates the moving parts heretofore found necessary in such mechanisms.

With these and other objects and advantages in view, as will hereinafter become more apparent, the invention will best be understood by reference to the following description of an illustrative embodiment taken in connection with the accompanying drawings thereof, wherein,

Fig. 1 is a plan view, with certain portions broken away to facilitate illustration, of a cooler embodying a can discharge mechanism constructed in accordance with the present invention.

Fig. 2 is a sectional elevation of the cooler as viewed along the line 2—2 of Fig. 1.

Fig. 3 is a side elevation of the upper portion of the cooler as viewed along the line 3—3 of Fig. 1.

Fig. 4 is a fragmentary perspective development of the terminal twisted portion of the can track as utilized in accordance with my invention, illustrating its conformation and how the cans are discharged therefrom.

Figs. 5 to 9 are successive sectional views of the twisted portion of the can track as viewed along the line 5—5, 6—6, etc. respectively of Fig. 1.

The cooler illustrated is of similar construction to that disclosed in my prior patent hereinbefore referred to, except for the substitution of the can discharge mechanism of the present invention, so that only so much of the cooler will be described as is deemed necessary for a full understanding of this invention, reference being made to said patent for other details of construction and operation with which the present invention is not directly concerned.

Referring first to Figs. 1 and 2, the cooler illustrated comprises an annular chamber formed by concentric cylindrical walls 1 and 1' positioned about a vertical axis, and secured to a suitable base 2. A cover plate 3 extends over the entire shell. The inner shell cylinder 1' has secured to it, near its upper end, a spider 4, spaced below the cover 3. A fixed central vertical shaft 5 extends between said cover and said spider, and serves as a bearing for an upper ring gear 6 of diameter somewhat less than shell 1.

The annular cooling chamber formed by the cylindrical shell walls 1 and 1' is provided with a helical can path or track formed by spaced helically trending T-rails 7 and 7' secured to the shells 1 and 1', respectively. The cans, as indicated at 35 in Fig. 2, are rolled along said track by a reel formed of spaced vertical bars 9 secured at their upper ends to the rim of gear 6 by bolts 10. The lower ends of said bars are secured by bolts 11 to a ring gear 12, which lies in the lower portion of the annular cooling cham-

ber and is guided by idler rollers 13 bearing against its inner periphery.

The can propelling reel thus comprises the upper ring gear 6, the lower ring gear 12, and the series of spaced vertical pusher bars 9. Its weight is supported entirely by the bearing of the upper ring gear 6 upon the shaft 5, a suitable thrust bearing 14 being provided at this point. In order to prevent distortion of the reel, it is driven from both ends, the upper and lower ring gears 6 and 12 being engaged by driven pinions 17 secured upon a vertical shaft 18. The lower pinion 17 is driven by a gear 19, in turn driven by any suitable power source, not shown.

The cans are fed into the annular cooling chamber through an inlet aperture 20 formed in shell 1 adjacent the bottom of the helical track, and are discharged through an outlet aperture 21 formed through shell 1 adjacent the top of the track.

The cans may be introduced into the cooler by any suitable mechanism, for example, that illustrated in my prior patent referred to above. Such a mechanism is illustrated diagrammatically in Fig. 1, wherein upright cans are delivered along a runway 25 in properly spaced relation to a star wheel 28, which is driven in timed relation to the pusher bars 9, and serves to introduce the cans therebetween. The runway 25 has an inclined portion 32 which tips the cans over onto their sides as they enter the space between the pusher bars. Thus the cans are made to lie on their sides on the horizontal flanges of the T-rails, in which position they are rolled upwardly along the trackway by the pusher bars 9.

During their helical progression upward, the cans are subjected to a descending spray of cold water introduced at the top of the annular chamber, as through a sprinkler pipe 33, provided with suitable outlet holes 34, and lying within the cooling chamber throughout its entire circumference except where the cans are discharged, water being supplied to the pipe from any suitable source. Any suitable outlet, not shown, may be provided to permit the water to drain from the bottom of the cooling chamber.

All the foregoing structure is described in my prior patent referred to above, and forms no part of the present invention except as the latter may be associated therewith, the present invention being concerned with the construction of the can discharge mechanism, now to be described.

As best seen in Figs. 3 and 4, the upper terminal portions of the rails 7 and 7' adjacent the can outlet aperture 21 are twisted outwardly toward the outer shell 1 to form a longitudinally twisted section of trackway which serves to gradually up-end the cans as they are advanced thereover under the propulsion of the pusher bars 9. This action is diagrammatically illustrated in Figs. 5 to 9 inclusive from which it will be seen that as the cans 35 are tilted toward upright position, the conformation of the rails simultaneously causes them to be shifted radially from between the pusher bars so that they are transferred out of engagement with the inner rail 7' and become supported entirely by the outer rail 7. At this time the flange 36 of the outer rail, which previously served, in conjunction with the corresponding flange on the inner rail, to guide the cans over the trackway, now cooperates with the stem or web 37 of the rail to support the cans on end.

As the cans are tilted out of engagement with the inner rail they are preferably given added support to counteract any tendency for them to topple back toward their original positions and this may be accomplished by increasing the width of the stem 37 of the outer rail as indicated at 38, to give additional lateral support to the cans. The flange 36 is likewise widened as shown to give added support to the can bottoms as they are tilted into upright position and prevent them from toppling away from the rail. The lower flange 39 of the outer rail is preferably cut away along the twisted portion of the rail to permit the outer edge of the rail to be twisted inwardly toward the path of the pusher bars without interfering with the cans rolling over the trackway therebeneath, and the upper flange 40 and stem or web 41 of the inner rail 7' may also be partially cut away or tapered to permit the rail to be twisted in close to the path of the pusher bars without interference with the bars.

As may be seen, the twist in the outer rail 7 is such as to bring the cans finally into full upright position to the outside of the path of the pusher bars, and the cans are thereupon discharged, under the urge of the oncoming cans therebehind onto a revolving conveyer disc 42, driven in the direction indicated by the arrow in Fig. 1 and extending into the outlet aperture 21 into can receiving relation with the outer rail. The disc 42 is mounted upon and driven by a vertical shaft 43 journalled in a bearing bracket 44 secured to the outside of the shell 1. The shaft 43 may be driven by means of intermeshing gears 45, 46 and 47, the gear 45 being secured to said shaft 43, and the gear 47 being secured to a shaft 48 journalled in bearing brackets 49 and 50 mounted on the shell 1. The intermediate idler gear 46 is carried by a stub shaft 51 journalled in the bracket 49. A pinion 52 secured to the upper end of the shaft 48 projects through a suitable opening in the shell 1 into engagement with the upper ring gear 6 by which it is driven.

Cooperatively associated with the disc 42 are inner and outer can guides 53 and 54, respectively, which serve to direct the cans from the disc to any suitable receiving device (not shown). The outer guide 54 may be conveniently formed, as shown, by an extension of the stem 37 of the rail 7, and the inner guide 53 may be supported by brackets 55 attached to the guide 54.

What I claim as new and desire to secure by Letters Patent is:

1. In a can handling apparatus, an upwardly extending helical trackway formed by a pair of helically trending separated can supporting rails along which a series of cans may be advanced in rolling procession, a rotatable can propelling reel having a series of upright pusher bars operable between said rails for engaging and propelling the cans therealong, and means for discharging the cans from said trackway comprising means for up-ending the cans as they are advanced along the trackway under the propulsive control of said pusher bars and simultaneously shifting them radially from between said bars to the outer circumference of the trackway.

2. In a can handling apparatus, an upwardly extending helical trackway formed by a pair of helically trending separated can supporting rails along which a series of cans may be advanced in rolling procession, a rotatable can propelling reel having a series of upright pusher bars operable between said rails for engaging and propelling the cans therealong, and means for discharging

the cans from said trackway comprising complementary twisted portions of said rails forming a twisted section of trackway upon which the cans are tilted into substantially upright position as they are advanced therealong under the propulsive control of said pusher bars.

3. In a can handling apparatus, an upwardly extending helical trackway formed by inner and outer helically trending separated can supporting rails along which a series of cans may be advanced in rolling procession, a rotatable can propelling reel having a series of upright pusher bars operable between said rails for engaging and propelling the cans therealong, and means for discharging the cans from said trackway comprising complementary twisted portions of said rails forming a twisted section of trackway for up-ending the cans as they are advanced therealong under the propulsive control of said pusher bars and simultaneously transferring them out of engagement with said inner rail and pusher bars into substantially upright position upon the outer rail.

4. In a can handling apparatus, an upwardly extending helical trackway formed by inner and outer helically trending separated can supporting rails along which a series of cans may be advanced in rolling procession, a rotatable can propelling reel having a series of upright pusher bars operable between said rails for engaging and propelling the cans therealong, means for discharging the cans from said trackway comprising complementary twisted portions of said rails forming a twisted section of trackway for up-ending the cans as they are advanced therealong under the propulsive control of said pusher bars and simultaneously transferring them out of engagement with said inner rail and pusher bars into substantially upright position upon the outer rail, and means cooperable with the cans for preventing them from toppling back toward the path of said pusher bars as said cans are disengaged from the inner rail.

5. In a can handling apparatus, an upwardly extending helical trackway formed by inner and outer helically trending separated can supporting rails along which a series of cans may be advanced in rolling procession, a rotatable can propelling reel having a series of upright pusher bars operable between said rails for engaging and propelling the cans therealong, means for discharging the cans from said trackway comprising complementary twisted portions of said rails forming a twisted section of trackway for up-ending the cans as they are advanced therealong under the propulsive control of said pusher bars and simultaneously transferring them out of engagement with said inner rail and pusher bars into substantially upright position upon the outer rail, and means providing added support to the cans as they are disengaged from the inner rail to prevent them from toppling back toward the path of said pusher bars.

6. In a can handling apparatus, an upwardly extending helical trackway formed by inner and outer helically trending separated can supporting rails along which a series of cans may be advanced in rolling procession, a rotatable can propelling reel having a series of upright pusher bars operable between said rails for engaging and propelling the cans therealong, means for discharging the cans from said trackway comprising complementary twisted portions of said rails forming a twisted section of trackway for up-ending the cans as they are advanced therealong under the propulsive control of said pusher bars and simultaneously transferring them out of engagement with said inner rail and pusher bars into substantially upright position upon the outer rail, said outer rail twisted portion increasing in width along its can supporting surfaces to provide added lateral and vertical support as the cans are disengaged from said inner rail.

7. In a can handling apparatus, an upwardly extending helical trackway formed by inner and outer helically trending separated can supporting rails along which a series of cans may be advanced in rolling procession, a rotatable can propelling reel having a series of upright pusher bars operable between said rails for engaging and propelling the cans therealong, means for discharging the cans from said trackway comprising complementary twisted portions of said rails forming a twisted section of trackway for up-ending the cans as they are advanced therealong under the propulsive control of said pusher bars and simultaneously transferring them out of engagement with said inner rail and pusher bars into substantially upright position upon the outer rail, and driven conveyer means positioned to receive said cans from said outer rail.

8. In a can handling apparatus, an upwardly extending helical trackway formed by inner and outer helically trending separated can supporting rails along which a series of cans may be advanced in rolling procession, a rotatable can propelling reel having a series of upright pusher bars operable between said rails for engaging and propelling the cans therealong, means for discharging the cans from said trackway comprising complementary twisted portions of said rails forming a twisted section of trackway for up-ending the cans as they are advanced therealong under the propulsive control of said pusher bars and simultaneously transferring them out of engagement with said inner rail and pusher bars into substantially upright position upon the outer rail, and a driven conveyer disc adjacent said outer rail onto which cans may be advanced from said rail by pressure of cans following along said trackway.

9. In a can handling apparatus, an upwardly extending helical trackway formed by inner and outer helically trending separated can supporting rails along which a series of cans may be advanced in rolling procession, said rails being of angular cross section to provide base and side flanges for lateral and endwise engagement respectively with the cans, a rotatable can propelling reel having a series of upright pusher bars operable between said rails for engaging and propelling the cans therealong, and means for discharging the cans from said trackway comprising complementary twisted portions of said rails forming a twisted section of trackway for up-ending the cans as they are advanced therealong under the propulsive control of said pusher bars and simultaneously transferring them out of engagement with said inner rail and pusher bars into up-ended position upon the side flange of the outer rail, said side flange of the outer rail being of increased width along the latter part of its twisted portion to provide added endwise support to the cans.

10. In a can handling apparatus, an upwardly extending helical trackway formed by inner and outer helically trending separated can supporting rails along which a series of cans may be advanced in rolling procession, said rails being of angular cross section to provide base and side

flanges for lateral and endwise engagement respectively with the cans, a rotatable can propelling reel having a series of upright pusher bars operable between said rails for engaging and propelling the cans therealong, and means for discharging the cans from said trackway comprising complementary twisted portions of said rails forming a twisted section of trackway for up-ending the cans as they are advanced therealong under the propulsive control of said pusher bars and simultaneously transferring them out of engagement with said inner rail and pusher bar into up-ended position upon the side flange of the outer rail, said base flange of the outer rail increasing in width along its twisted portion to provide added lateral support to the cans as they are disengaged from the inner rail.

11. In a can handling apparatus, an upwardly extending helical trackway formed by inner and outer helically trending separated can supporting rails along which a series of cans may be advanced in rolling procession, said rails being of angular cross section to provide base and side flanges for lateral and endwise engagement respectively with the cans, a rotatable can propelling reel having a series of upright pusher bars operable between said rails for engaging and propelling the cans therealong, and means for discharging the cans from said trackway comprising complementary twisted portions of said rails forming a twisted section of trackway for up-ending the cans as they are advanced therealong under the propulsive control of said pusher bars and simultaneously transferring them out of engagement with said inner rail and pusher bar into up-ended position upon the side flange of the outer rail, said side and bottom flanges of the outer rail being of increased width along a part of their twisted portions to provide added lateral and endwise support to the cans.

12. In a can handling apparatus, an upwardly extending helical trackway formed by inner and outer helically trending separated can supporting rails along which a series of cans may be advanced in rolling procession, said rails being of angular cross section to provide base and side flanges for lateral and endwise engagement respectively with the cans, a rotatable can propelling reel having a series of upright pusher bars operable between said rails for engaging and propelling the cans therealong, and means for discharging the cans from said trackway comprising complementary twisted portions of said rails forming a twisted section of trackway for up-ending the cans as they are advanced therealong under the propulsive control of said pusher bars and simultaneously transferring them out of engagement with said inner rail and pusher bar into up-ended position upon the side flange of the outer rail, said side flange of the outer rail being of increased width along the latter part of its twisted portion to provide added endwise support to the cans, and means cooperable with the cans for preventing them from toppling back toward the path of said pusher bars as said cans are disengaged from the inner rail.

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