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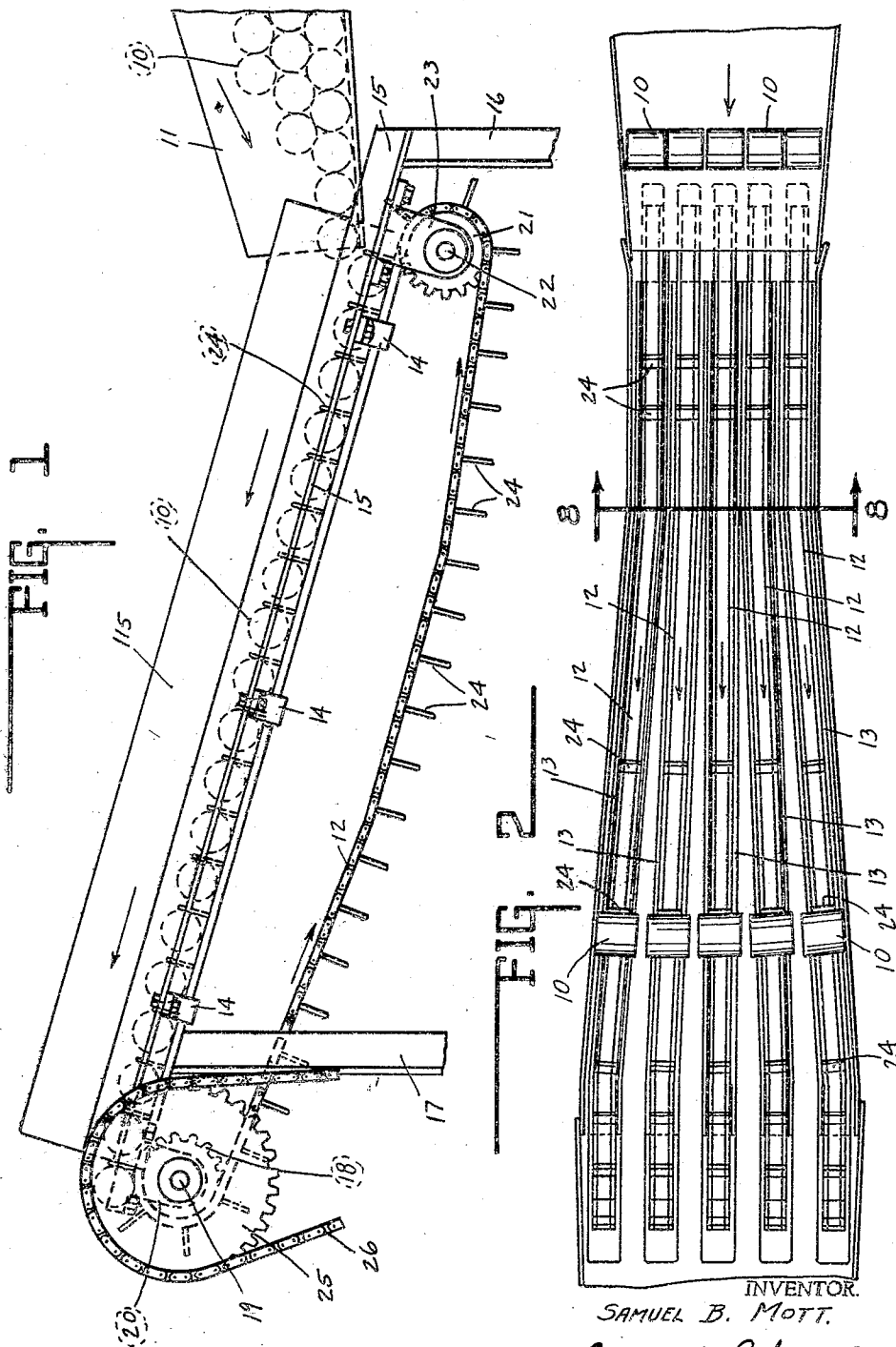
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1,870,375

CONVEYER FOR CHANGING GROUPS OF ARTICLES INTO SINGLE FILE

Filed Sept. 25, 1931

4 Sheets-Sheet 1



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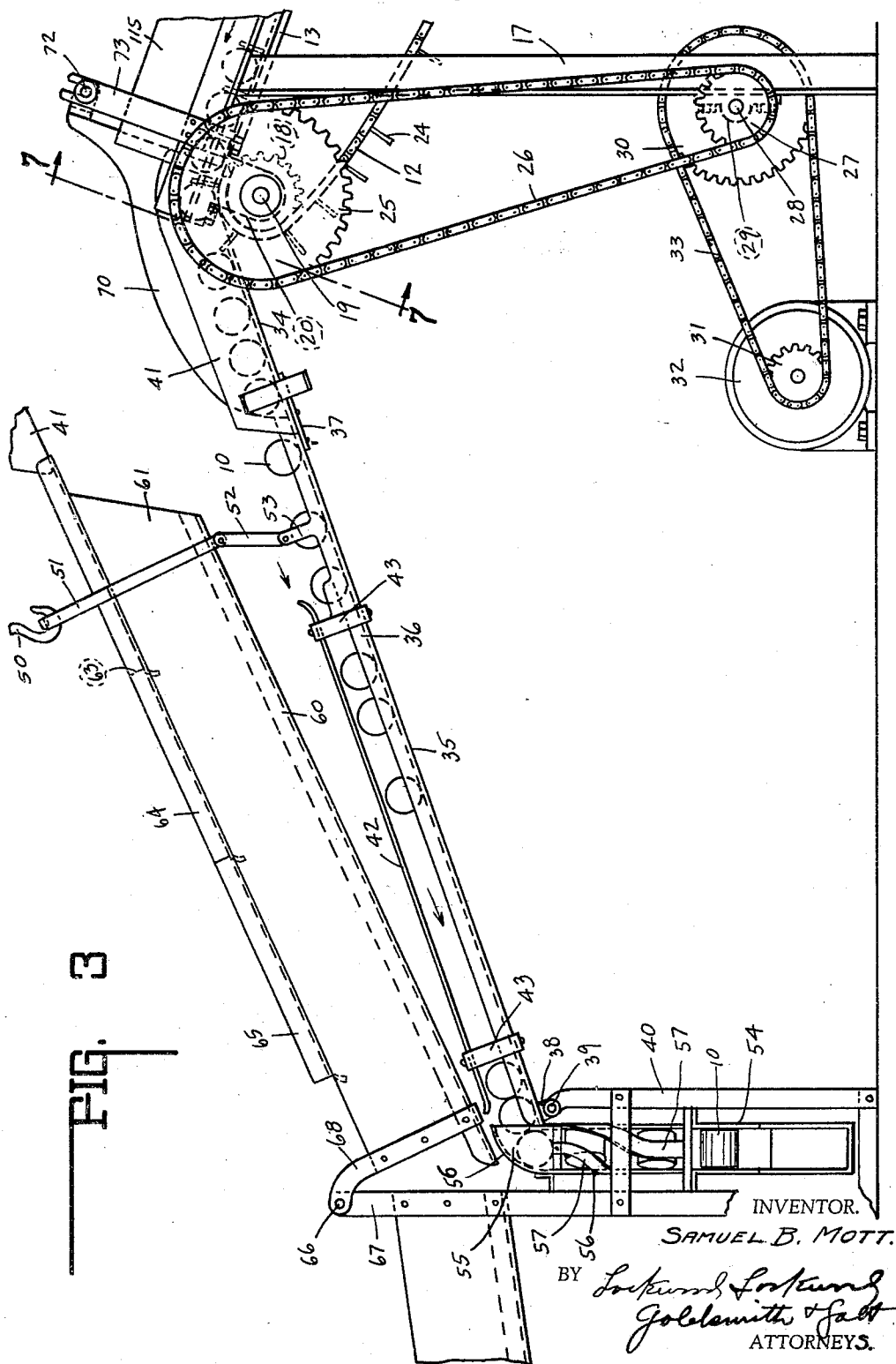
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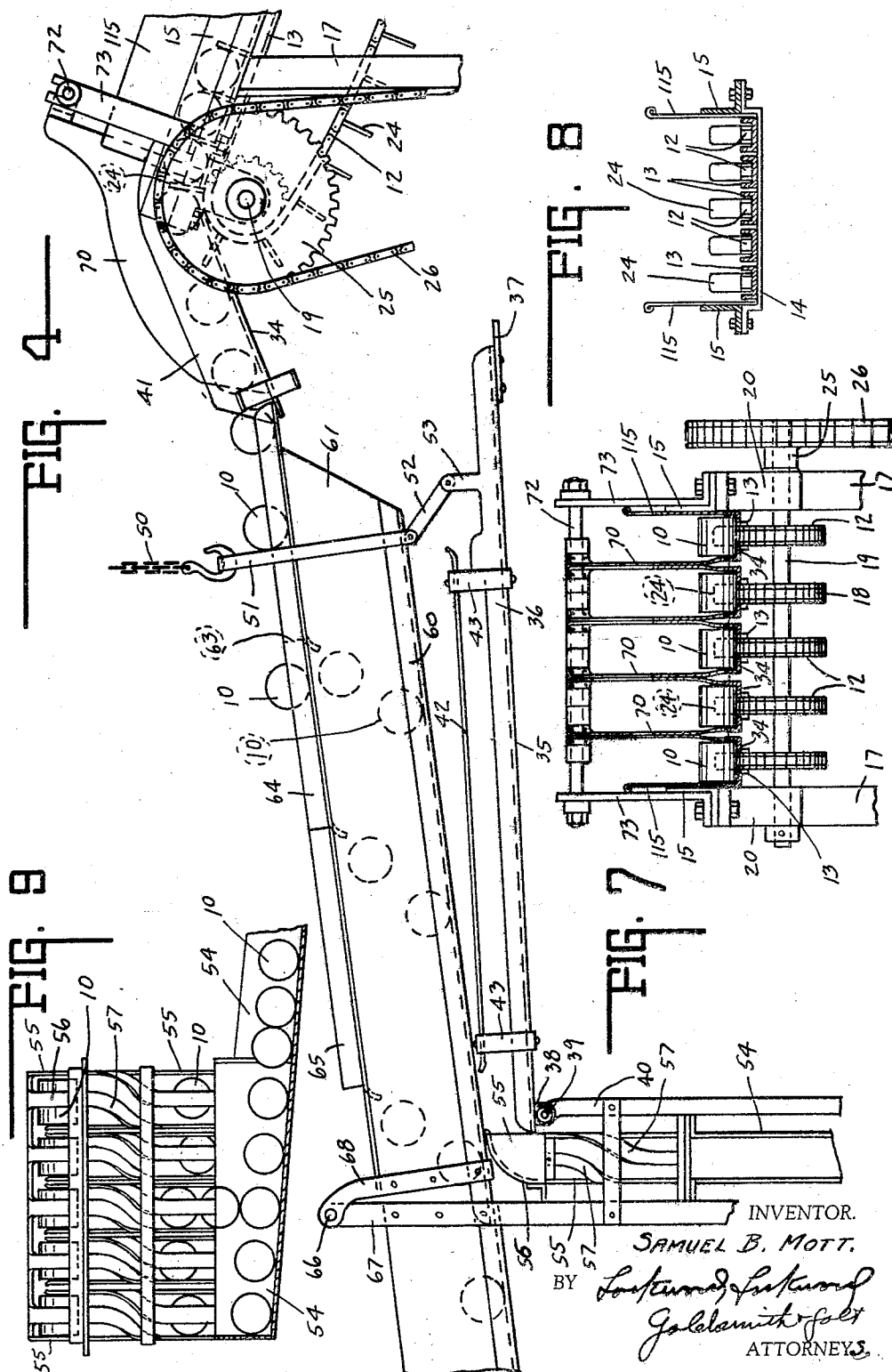
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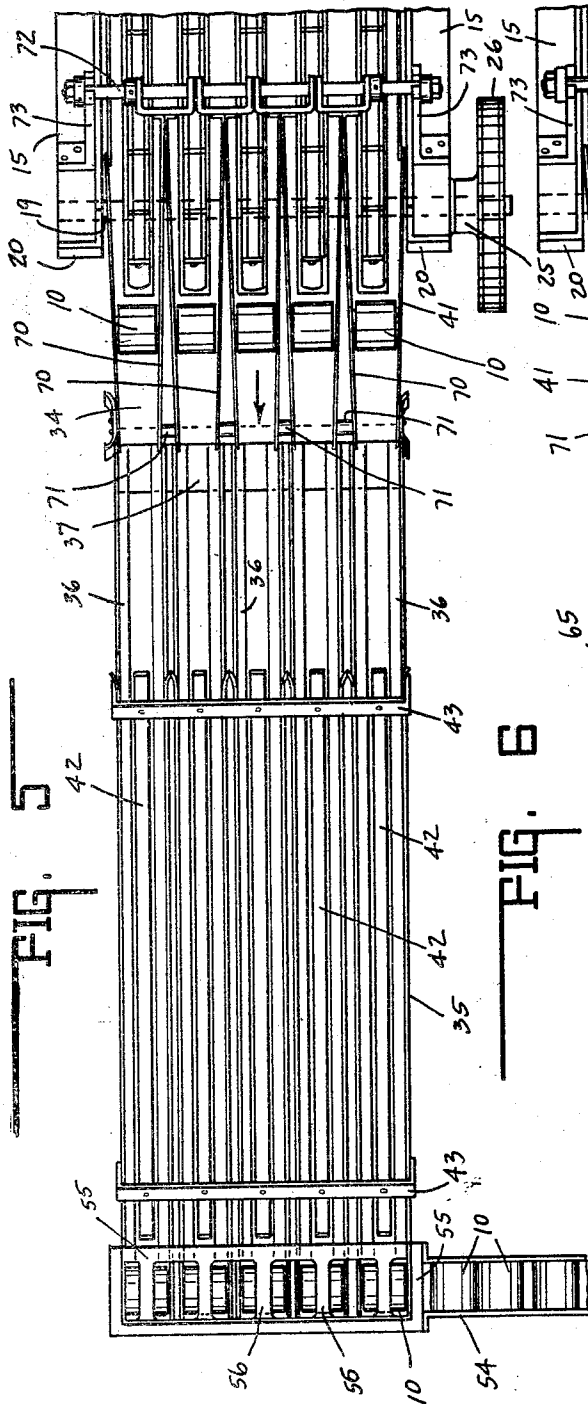
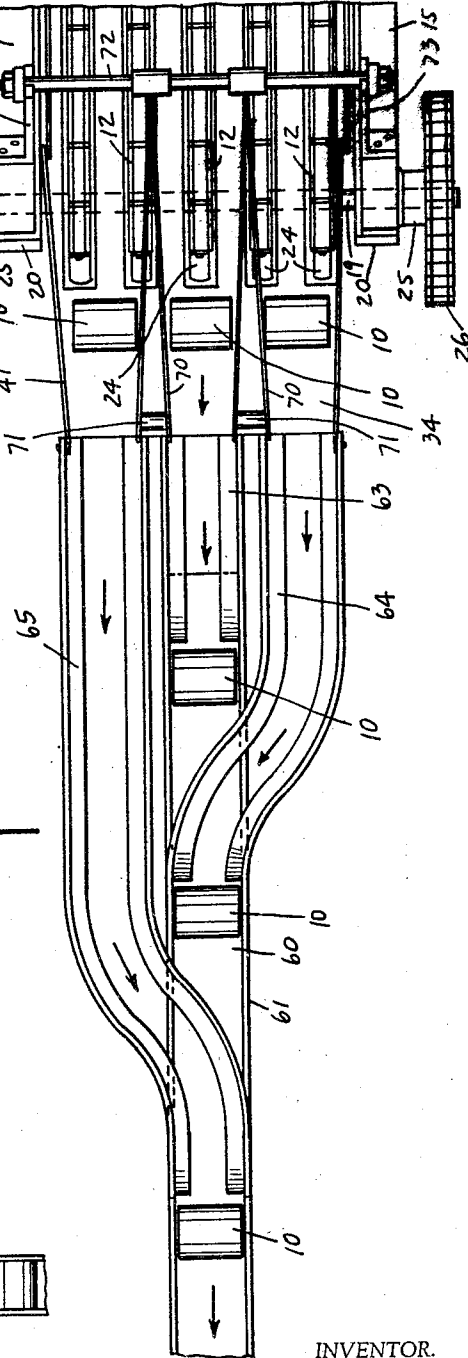


FIG. 6



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CONVEYER FOR CHANGING GROUPS OF ARTICLES INTO SINGLE FILE

Application filed September 25, 1931. Serial No. 565,076.

This invention relates to a portion of a system for conveying cans and like articles, particularly one which requires the cans to be conveyed to and from sterilizing apparatus. For such purposes, it is desirable that cans coming upright in single file be mechanically filled into metal baskets with open tops and with the cans in sidewise position, and the can-filled baskets then conveyed to and from sterilizing apparatus and thereafter the cans be discharged from the basket on their sides.

This present invention takes the cans after they have been discharged from the sterilizing baskets in a plurality of vertical ricks or rows and mechanically brings them again into single file on their sides adapted to roll down a narrow chute to the place where they are inspected, labeled and packed for shipment.

One feature of the invention consists in the combination with a conveyer of a plurality of rows of cans and the like, and a single file conveyer, of means intermediate said two conveyers which receives the cans from the plurality of rows and guide and converge them so that they will, without interference with each other, enter the single file conveyer and roll in single file.

Two means are shown for converging the plurality of rows of cans into a single file, one for large cans and the other for small cans, and these two means are associated with the conveying apparatus so that either one may readily be used, according to the size of the cans being handled at the time. In both of these forms, there are trackways for converging the cans into single file by reason of said trackways being variable in length. In the form for the large cans, there is a straight central trackway that is short, and lateral trackways of varying lengths greater than the central guideway but bent so as to register at the discharge ends and successively discharge into the single file conveyer. In the other form for small cans, there are twisted guideways extending downwardly and discharging successively into an inclined single file conveyer. In both of these forms, since the cans are rolling on their sides, there

will be no blocking or confusion in the movement of the cans one after the other into the single chute, and such movement is very rapid.

Another feature of the invention consists in forming one section of the conveyer as a positively driven elevating conveyer which discharges on a descending conveyer through which the articles move by gravity to the converging mechanism and single file conveyer.

Another feature of the invention consists in means for readily altering the apparatus adapted to handle different sizes of cans. In that connection, the trackways of the elevating conveyer toward the discharge end are spread apart so as to adapt the same to be discharged on the descending conveyer, the construction of the trackways of which requires the descending conveyer to be made relatively wide.

Another feature of the invention consists in combination with the conveyer in which the cans are descending in a plurality of vertical ricks beside each other, of a conveyer having a plurality of driven chains in alignment with each vertical rick of cans and having lugs on the links of said chains so that the cans will be received separately in proper order, and conveyed in single rows.

While the invention has been used for handling cans, its use is not limited to cans as it may be used for handling jars or other round articles that will roll. Also, the invention is not limited to any particular form of conveyer, whether it be a driven or a gravity conveyer. Nor are some features of the invention limited to the particular construction shown herein to illustrate the invention, as some features may be used without the tion of the first part of the apparatus construction of elevating conveyer here shown.

The full nature of the invention will be more fully understood from the accompanying drawings and the following description and claims:

In the drawings, Figure 1 is a side elevation of the first part of the apparatus constituting this invention, parts being broken away. Fig. 2 is a plan view of what is shown

in Fig. 1 with some omissions. Fig. 3 is a side elevation of a succeeding portion of the apparatus constituting this invention, parts at each end being broken away and showing the apparatus adjusted for handling small cans. Fig. 4 is the same as Fig. 3 with the parts adjusted for handling large cans. Fig. 5 is a plan view of the lower section of the descending conveyer shown in Fig. 3. Fig. 6 is a plan view of the upper section of said conveyer shown in Fig. 4. Fig. 7 is a vertical transverse section on the line 7—7 of Fig. 3. Fig. 8 is a transverse section on the line 8—8 of Fig. 2. Fig. 9 is a view partly in section of the downward conveyer shown in the left hand of Fig. 3.

As appears in Figs. 1 and 2, cans and like articles 10 roll down the chute or conveyer 11 in a plurality of vertical ricks side by side. The cans have come from a sterilizing basket (not shown) in which they were filled in superimposed layers and which basket was dumped in the right hand end (not shown) of the conveyer or chute 11 in Fig. 1. In the apparatus in which this invention has been used, the cans roll down the chute 11 by gravity, but it is immaterial whether they travel by gravity in a conveyer or chute 11, or by a power-driven conveyer.

From the end of the chute or conveyer 11, the cans of each vertical rick roll upon a driven elevating chain 12, as shown in Fig. 1. In Fig. 2, there are five of these elevating chains shown beside each other, and each chain travels in a channel iron 13, as shown in Fig. 8, and said channel irons are supported by straps 14 from the frame side angle bars 15, as seen in Figs. 1 and 7. Said angle bars 15, at their lower ends, are secured on uprights 16 and, at their upper ends, to uprights 17. Chains 12 are driven by sprockets 18 on shaft 19, shown at the upper end of Fig. 1. Shaft 19 is mounted in bearings 20 secured to the underside of the angle irons 15, as seen in Fig. 7. At the other end, the sprocket chains are mounted on sprockets 21 on shaft 22 in bearings 23 secured to the underside of said frame bars 15. The links of said chains 12 carry lugs 24 that project upwardly from the upper side of the chains and project behind each can 10 whereby the chains are enabled to receive and elevate the cans individually, as seen in Fig. 1. Side boards 115 are secured to said elevating conveyer.

The driving shaft 19 of said elevating conveyer is driven by a sprocket wheel 25 as seen in Fig. 3 at the right hand end, and the same is driven by sprocket chain 26 leading from the small sprocket 27 on shaft 28 mounted in bearings 29 secured to uprights 17, and the shaft 28 is driven by sprockets 30 and 31 and chain 33 from a motor 32. The power drives the elevating chains 12 in the direction indicated by the arrows for the purpose heretofore specified.

From the upper end of the elevating conveyer 12 shown in Fig. 1, the cans descend by gravity down the chutes 34 to the descending conveyer 35, as seen in Figs. 3 and 5. The cans are still on their sides so that they can roll and they pass down the descending conveyer in the same number of rows and order as in the elevating conveyer.

The descending conveyer 35, in the form shown in Fig. 5, has five parallel chutes or trackways 36 for five rows of cans. The trackways are secured at their upper ends on a cross plate 37, seen in Figs. 3 and 4 which forms the series of trackways 36 in a unit. At their lower ends, said trackways are secured to a cross plate 38 that is pivoted at its ends on pivot pins 39 in the frame 40, whereby the series of trackways can be tilted to the position shown in Fig. 4 or that shown in Fig. 3. At the upper end of the descending conveyer 35 there are side boards 41 and at the lower part thereof there are top guard boards 42 secured at each end by straps 43 to the sides of the descending conveyer 35. The top bars 42 are to prevent the cans from escaping while rolling down the trackways.

The upper ends of said descending conveyer is supported by a vertically adjustable chain 50 hooked in the stirrup 51 which embraces the upper conveyer 60 and at its lower end is connected by links 52 to arms 53 extending up from the outside of the trackways 36 of the descending conveyer, as seen in Figs. 3 and 5. By this means, said lower descending conveyer 35 is held in working position, as shown in Fig. 1, or in idle position, as shown in Fig. 4.

From the descending conveyer 35, with its plurality of trackways 36, as seen in Fig. 3, the cans roll into a downwardly-descending conveyer section 55 which converges them into a single file conveyer or chute 54. The intermediate section 55 has a top head transversely extending, as seen at the left hand end of Fig. 5. It has parallel guards 56 to prevent the escape of the cans. In said section 55, there are downwardly-descending converging twisted guide bars 57, as seen in Fig. 9. The function of these twisted guide bars is to turn the cans horizontally 90 degrees so that they will roll down into the inclined chute 54 which extends at substantially a right angle from the previous descending conveyer 35. Said chute 54 is narrow, as seen in Fig. 5, and, therefore, in it all the cans roll down in single file and pass from the apparatus constituting this invention to a position where they can be inspected, labeled and packed for shipment (not shown).

This apparatus is provided for handling cans and the like of a plurality of sizes. What has heretofore been described and as shown in Figs. 2, 3 and 5, is used for handling relatively small cans. If larger cans

are also employed, they are elevated by the elevating conveyor 12 as shown in Fig. 1, as the lugs 24 are far enough apart to receive either the large or the small cans. But after
 5 leaving the elevating conveyor 12, the large cans travel down the upper descending conveyor 60, shown in Figs. 1, 4 and 6. The conveyor 60 is let down, from the position shown in Fig. 3 to that shown in Fig. 4, by the chain
 10 50 so as to enable the receiving end of conveyor 60 to receive the cans as they come down chute 34 from the rear end of the elevating conveyor 12. The frame 60 of the descending conveyor is hingedly supported
 15 on pivots 66 at the upper end of the frame upright 67 by suspension bars 68, as seen in Fig. 4.

The descending conveyor 60 is illustrated in Figs. 4 and 6. It has high sides 61 so as
 20 to make a relatively deep trough-like conveyor wide enough, however, to receive cans only in single file as shown in Fig. 6. Above said single file can conveyor 60 there are a plurality of single can trackways 63, 64 and
 25 65 of varying lengths, as seen in Fig. 6. These three trackways receive the cans from three sections or chutes 34 and of the elevating conveyor 12 and discharge them into the descending conveyor 60 at different suc-
 30 cessive positions, as shown. Thus the short track 63 discharges its cans into said chute 60 ahead of track 64 and the latter discharges its cans ahead of track 65, so that all the cans are discharged into said single file chute 60 in
 35 succession without interfering, and pass or roll down the chute by gravity into the position for inspection, labeling and packing for shipment.

As shown in Fig. 2, the chains in the elevating conveyor 12 gradually diverge as they
 40 approach the discharge end or elevated portion of the said elevating conveyor, so the rows of cans will be appreciably separated or spaced apart and will pass between the partitions 70, shown in Figs. 1 and 4, and there-
 45 by be guided correctly to the tracks of the downwardly-descending conveyor 60. Because of the angle iron tracks, the descending conveyor must be wider than the small end of
 50 the elevating conveyor 12.

The partition plates 70 are preferably made of two sheets of metal, as shown in Fig. 5, with a spacer 71 between the discharging
 55 ends thereof. The other ends of said partition plates are hinged on the transverse rod 72 which is carried on a pair of uprights 73 secured to the sides of the upper parts of the
 60 elevating conveyor 12. The pivotal mounting of partition plates 70 enables them to rise or be pushed out of the way by any can that becomes displaced while travelling upward
 65 on the elevating conveyor 12. This will enable a misplaced can to pass on without choking the machinery or stopping operation of
 70 the apparatus.

This feature is the same for the large cans as seen in Fig. 6, as for the small cans as
 75 seen in Fig. 5. When it is desired to change from large to small cans, or the reverse, the operator picks up the frame for the small
 80 cans, consisting of the partition plates 70 and rods 72, shown in Fig. 5, and replaces it with the corresponding frame assembly of partition plates 70 and rods 75 for large
 85 cans as shown in Fig. 3. Hence the change from large cans to small cans, or the reverse, is simply and quickly done. When such
 90 change is made, the receiving end of the descending conveyor must be changed, as heretofore explained from the position shown in
 95 Fig. 3 to that shown in Fig. 4, or the reverse. No other part needs to be changed for operat-
 100 ing on cans of different sizes.

It is thus seen that with the conveying
 105 apparatus constituting this invention, one is enabled to readily change from a plurality conveyor into a single file conveyor, whereby
 110 cans and the like, which come to this apparatus in a plurality of vertical ricks, will leave the same in a single file chute, so that the cans
 115 can be readily inspected, labeled and packed for shipping by one group of operators and at one location, and the cans pass such group
 120 of operators in rolling position with their circumferential surfaces exposed. Also, the operation herein explained enables cans of vari-
 125 ous sizes to be handled for the purposes above stated and the apparatus will not become clogged, if any can becomes misplaced while
 130 travelling up the elevating conveyor. The operation of the machine is extremely rapid, as the cans pass like a rapidly flowing stream
 135 of water, and yet the cans will not interfere with each other or become clogged in the apparatus at any time during their passage.

The invention claimed is:

1. Conveying apparatus for changing
 140 groups of cans and like articles into single file, which includes a conveyor for groups of said articles, a downwardly-inclined single
 145 file conveyor extending at a right angle thereto, and an intermediate section connecting said conveyers which has trackways for the
 150 articles twisted at substantially ninety degrees so as to horizontally turn the articles correspondingly before entering the single
 155 file conveyor.

2. Conveying apparatus for changing
 160 groups of cans and like articles into single file, including a conveyor having a plurality of parallel trackways, a transversely-ar-
 165 ranged inclined single file conveyor below the discharge end of said first-mentioned conveyor, and an intermediate section with the
 170 upper end adapted to receive the cans from the trackways of the first-mentioned conveyor in transverse alignment and having descend-
 175 ing trackways in position to receive the cans individually and discharge them behind each other into said single file conveyor.

3. Conveyor apparatus for changing groups of cans and like articles into single file, including a descending conveyor having a single file conveyor, and separate substantially parallel trackways for conveying the groups of cans and discharging them into said single file conveyor, said trackways being of variable lengths so as to discharge into said single file conveyor in succession, one after the other, one of said trackways being in alignment with the single file conveyor and the other trackways being variable in length and turned laterally so as to discharge the cans into said single file conveyor into successive positions.

4. Conveyor apparatus for changing groups of cans and like articles into single file, including means for supplying cans and like articles in a plurality of vertical ricks, a conveyor provided with a plurality of parallel trackways each of which is adapted to receive the cans of a rick, said plurality of trackways being gradually spread to space them apart at the discharge end, a single file conveyor, and an intermediate section between the discharge end of said first-named conveyor and the single file conveyor with one end thereof adapted to receive the cans from the spread trackways and the other end of said intermediate section having a plurality of substantially vertical guideways, one registering with each trackway in the preceding conveyor and discharging in said single file conveyor so as to deliver the cans as they come from the plurality of trackways to said single file conveyor.

5. Conveyor apparatus for changing groups of cans and like articles into single file, including means for supplying cans and like articles in a plurality of vertical ricks, a conveyor provided with a plurality of parallel trackways each of which is adapted to receive the cans of a rick, said plurality of trackways being gradually spread to space them apart at the discharge end, a single file conveyor, and a conveyor between the discharge end of said first-named conveyor and the single file conveyor with one end thereof having trackways spread at the receiving end so as to receive the cans from the spread trackways of said first-named conveyor, said last-mentioned trackways varying in length and successively discharging into said single file conveyor.

6. Conveyor apparatus for changing groups of cans and like articles into single file, including means for supplying cans in a plurality of rows beside each other, two descending conveyers each with trackways for receiving individually the rows of cans from the supply means, one of said descending conveyers being over the other and both conveyers pivoted at their discharge ends, and vertically adjustable means for holding the receiving ends of said descending con-

veyers in position for either of them to register with the can-supplying means as desired.

7. Conveyor apparatus for changing groups of cans and like articles into single file, including means for supplying cans in a plurality of rows beside each other, a descending conveyor with trackways for receiving individually the rows of cans from the supply means, a second descending conveyor over the first descending conveyor adapted for receiving and conveying cans different in size from those adapted to be handled by the other conveyor, a frame to the upper end of which the discharge ends of the two descending conveyers are pivoted, and vertically adjustable means for holding the receiving ends of said descending conveyers in position for either of them to register with the can-supplying means.

8. Conveyor apparatus for changing groups of cans and like articles into single file, including an elevating conveyor, a plurality of descending conveyers each having a plurality of trackways for the different rows of cans, means for supporting said descending conveyers so as to bring into registry with the elevating conveyor either of said descending conveyers as desired, an intermediate section between the elevating and descending conveyers and interchangeable guideways adapted to be mounted on said intermediate section for guiding the rows of cans to the desired trackway on the descending conveyor, whereby the device is adapted for handling cans of different sizes.

9. Conveyor apparatus for changing groups of cans and like articles into single file, including an elevating conveyor having a plurality of trackways, each for receiving a single row of cans and like articles, a plurality of descending conveyers, one above the other with trackways for receiving cans of different sizes, means for vertically adjusting the receiving ends of said descending conveyers so as to make the desired one of them register with the discharge end of the elevating conveyor, and interchangeable means readily put in place and removed for guiding the cans from the discharge end of the elevating end of the conveyor to the receiving end of either of the receiving conveyers, whereby the conveying apparatus may be adapted for conveying cans of different sizes.

10. Conveyor apparatus having a number of substantially independent parallel trackways for conveying each a row of cans and like articles, a smaller number of receiving trackways in substantial alinement with said first mentioned trackways, substantially parallel intermediate tapering guideways adapted to receive the cans from said first mentioned trackways and deliver them to the reduced number of said receiving trackways, and changeable means for supporting said

intermediate guide ways with their larger ends overlapped by said first mentioned trackways and with their reduced ends discharging on the receiving guideways, whereby the
5 number of rows of cans can be reduced in passing from the first mentioned guideways to the receiving guideways.

11. Conveyer apparatus having a number of substantially parallel elevating trackways
10 for conveying and elevating a plurality of rows of cans, a smaller number of descending receiving trackways following said ascending trackways, intermediate guideways between the ascending and descending trackways
15 equaling in number the descending trackways and with their receiving ends relatively widened and in position to receive the cans from the ascending trackways and deliver them to the receiving trackways, and means for supporting said intermediate guideways which
20 enables the number thereof to be readily altered to agree with the number of descending trackways.

In witness whereof, I have hereunto affixed
25 my signature.

SAMUEL B. MOTT.

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