

Oct. 11, 1955

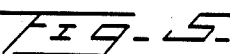
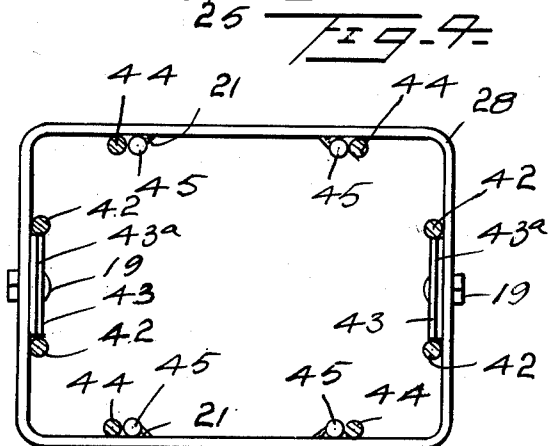
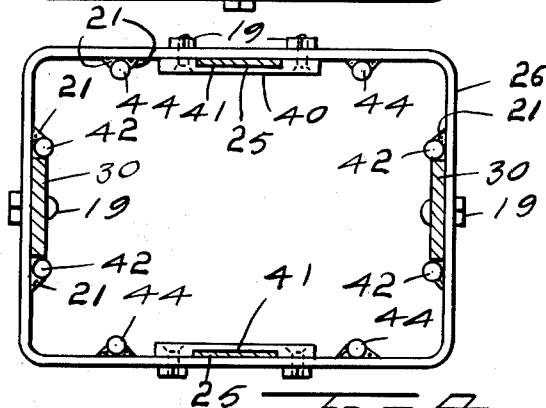
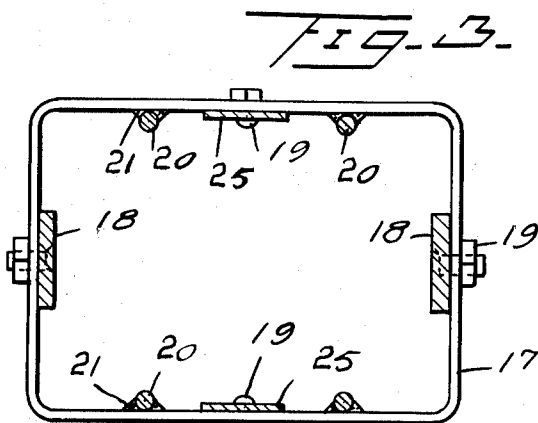
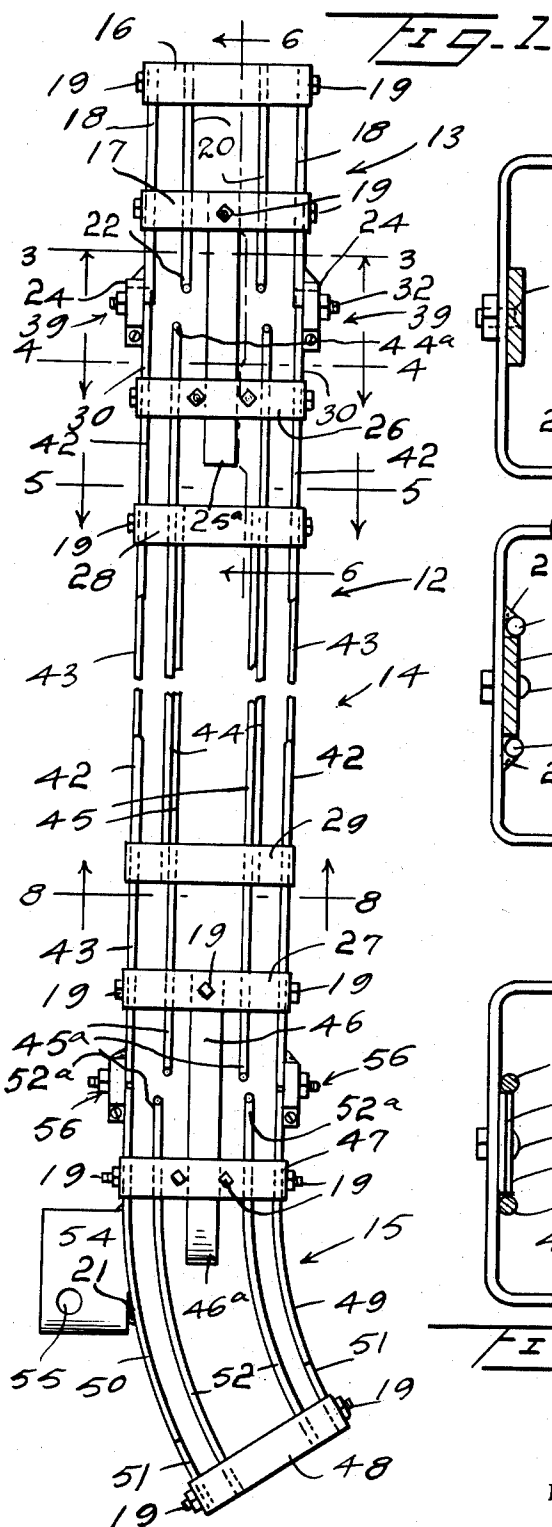
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2,720,302

TELESCOPIC CAN AND PACKAGE CONVEYING CHUTE

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3 Sheets-Sheet 1



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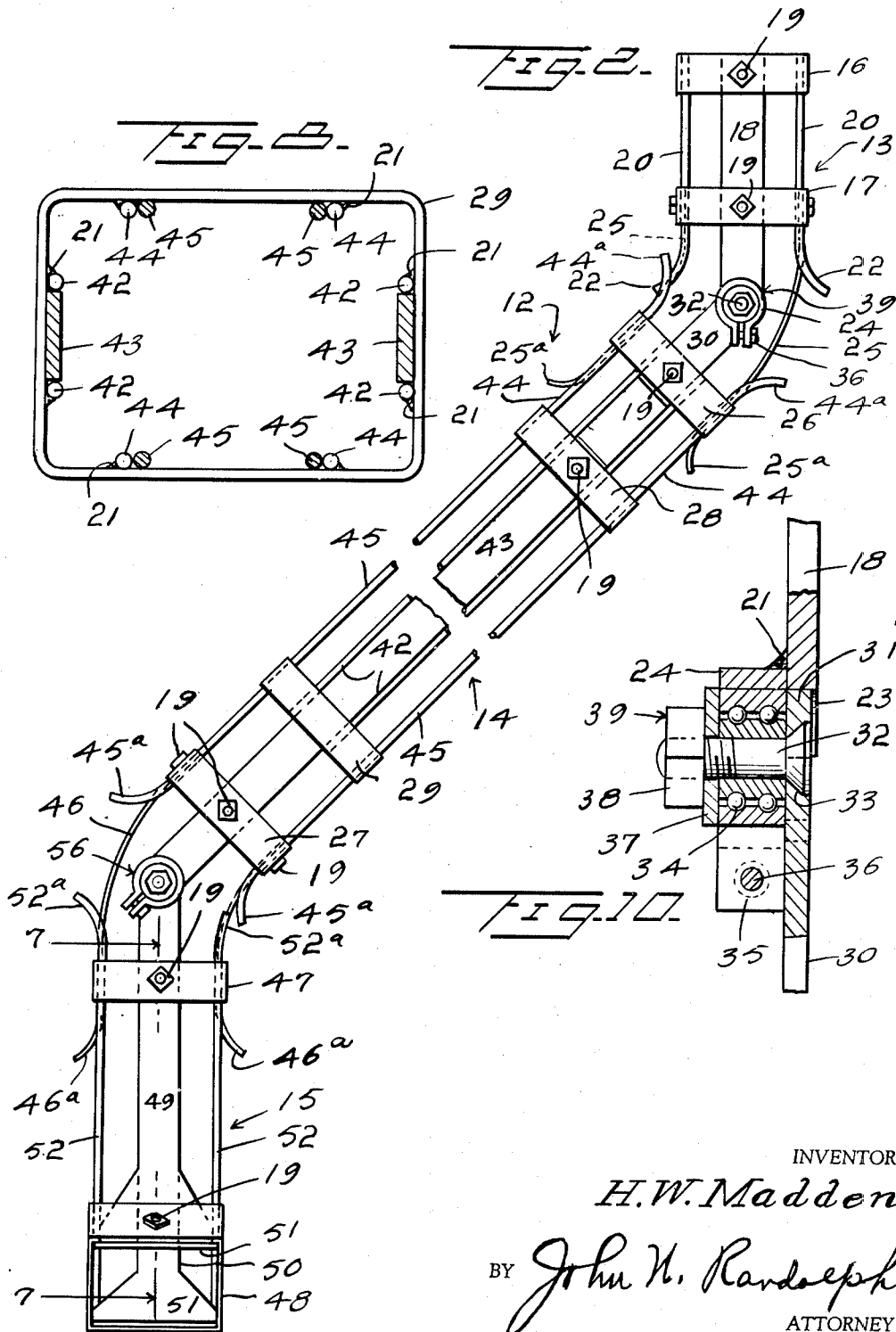
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TELESCOPIC CAN AND PACKAGE CONVEYING CHUTE

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3 Sheets-Sheet 2



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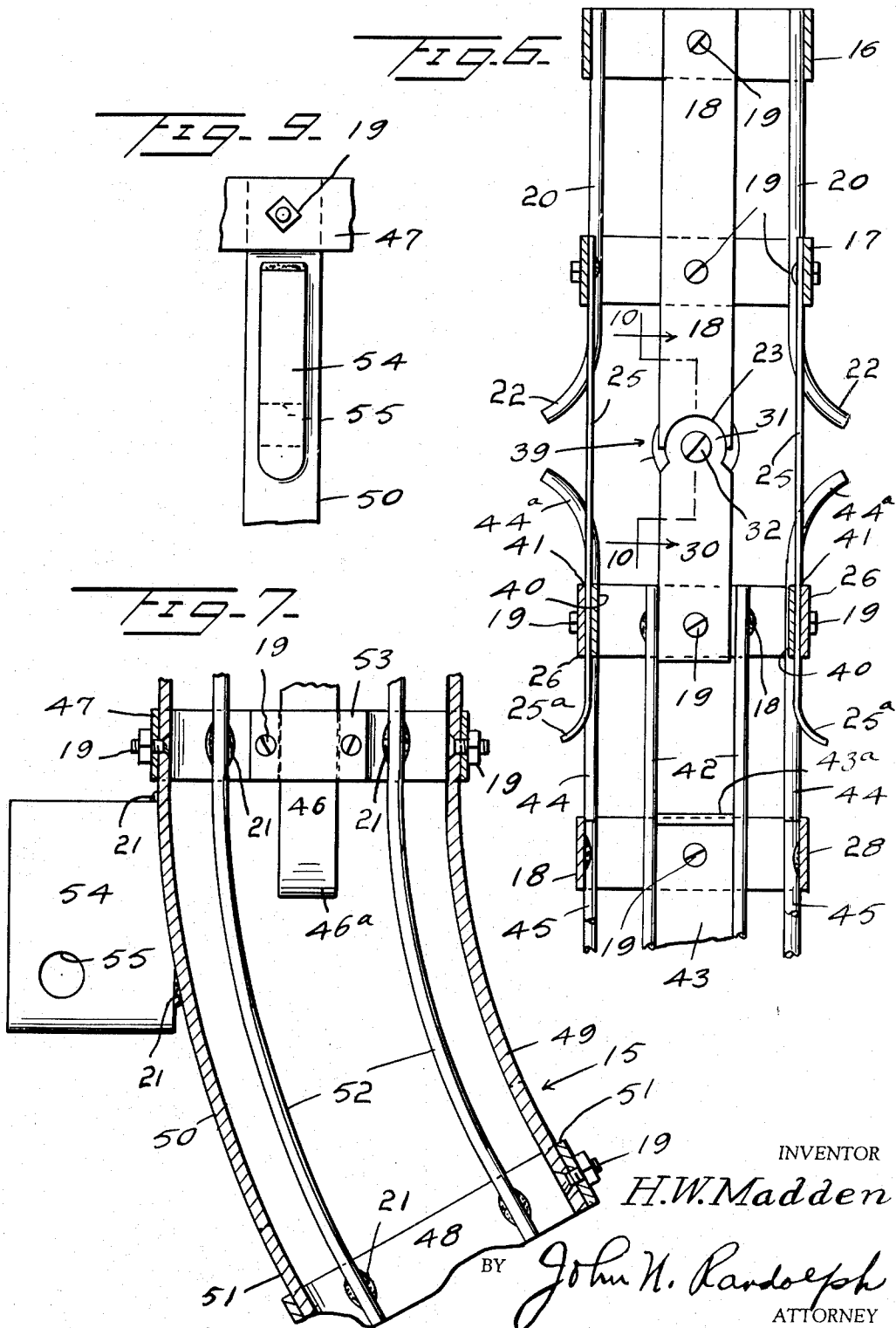
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3 Sheets-Sheet 3



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2,720,302

## TELESCOPIC CAN AND PACKAGE CONVEYING CHUTE

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Application September 9, 1953, Serial No. 379,261

10 Claims. (Cl. 193—2)

This invention relates to a novel telescopic or extensible chute for gravity feeding cans, cartons, boxes or the like to a stacking machine and has for its primary object to provide a telescopic or extensible chute capable of feeding containers of different types and of different cross sectional shapes by gravity from a suitable supply source to a stacking machine such as disclosed in my prior U. S. Patent No. 2,639,823 through the use of which a conveyor system may be dispensed with.

A further object of the invention is to provide a telescopic container chute formed of flexibly connected sections which in combination with the extensible means thereof permits an upper end of the chute to be secured immovably to the outlet of a source of supply of the containers to be fed through the chute, and a lower discharge end of the chute to be movably supported and connected to a suitable carrier for traveling back and forth relatively to a machine to enable the containers fed through the chute to be arranged in stacked courses.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a side elevational view of the chute shown in substantially a fully retracted position and with an intermediate, extensible section thereof shown broken away;

Figure 2 is a front elevational view of the same looking from right to left of Figure 1;

Figures 3, 4 and 5 are enlarged cross sectional views thereof taken substantially along planes as indicated by the lines 3—3, 4—4 and 5—5, respectively;

Figure 6 is an enlarged fragmentary longitudinal sectional view taken substantially along a plane as indicated by the line 6—6 of Figure 1;

Figure 7 is an enlarged fragmentary longitudinal sectional view taken substantially along a plane as indicated by the line 7—7 of Figure 2;

Figure 8 is an enlarged cross sectional view taken substantially along a plane as indicated by the line 8—8 of Figure 1;

Figure 9 is a fragmentary rear elevational view looking from left to right of Figure 7, and

Figure 10 is an enlarged longitudinal sectional view taken substantially along a plane as indicated by the line 10—10 of Figure 6.

Referring more specifically to the drawings, the extensible flexible chute in its entirety is designated generally 12 and generally includes an upper inlet section 13, an extensible intermediate section 14 and a lower outlet section 15.

The upper inlet section 13 includes a pair of rectangular substantially rigid bands 16 and 17 to opposite sides of which are connected a pair of bars 18 by suitable fastenings 19. The bars 18 are disposed on the inner sides of the bands 16 and 17 as are likewise two pairs of rods 20 which are secured as by welding, as seen at 21, to the other opposite sides of the bands 16 and 17. The

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outer ends of the rods 20 terminate at the outer edge of the outer band 16 which forms the inlet of the chute 12 while the inner ends of the rods 20 extend beyond the inner band 17 and terminate in outwardly flared terminals 22. The bands 16 and 17 are supported in spaced apart substantially aligned relationship to one another by the bars 18 and rods 20. The bars 18 likewise terminate at the outer band 16 but extend inwardly to beyond the inner band 17. As best illustrated in Figures 6 and 10, the bars 18 have arcuately notched inner ends 23. Intermediate portions of split ring members 24 are secured to the outer sides of the bars 18, as by welding as indicated at 21, and said intermediate portions are disposed with their inner sides in registration with the notches 23. Corresponding ends of a pair of spring strips 25 are secured by fastenings 19 to the inner surfaces of opposite sides of the band 17, between the rods 20, and extend downwardly therefrom to beyond the notched lower ends of the bars 18.

The intermediate extensible or telescoping section 14 may be made in various lengths and is ordinarily substantially longer than the end sections 13 and 15. Said intermediate section includes an upper band 26, a lower band 27 and intermediate bands 28 and 29 which are located adjacent the bands 26 and 27, respectively, when the extensible section 14 is in a retracted position. Said bands of the intermediate section correspond structurally to the bands 16 and 17. A pair of bars 30 have inner or lower ends disposed against inner surfaces of opposite sides of the upper band 26 and secured thereto by additional fastenings 19. The bars 30 extend upwardly or outwardly from the band 26 and terminate in restricted rounded ends 31 which fit turnably in the notches 23, as best illustrated in Figures 6 and 10. A bolt 32 extends outwardly through an opening 33 of each bar end 31 and is centrally disposed relatively to the outer edge or periphery of said bar end. The heads of the bolts 32 are countersunk in the openings 33, as best seen in Figure 10. An antifriction ball bearing unit 34 is turnably mounted on the bolt 32 and is disposed turnably in the split ring 24 of the adjacent bar 18. The depending spaced terminals 35 of the split ring 24 are connected by a threaded clamping fastening 36 which is tightened only sufficiently so that the ball bearing unit 34 may revolve in the split ring 24. A washer 37 engages the bolt 32 and bears against an outer side of the ball bearing unit 34 and a nut 38 engages the bolt 32 and bears against the outer side of the washer 37. The two ball bearing pivots, designated generally 39, and best illustrated in Figures 6 and 10, pivotally connect adjacent ends of the chute sections 13 and 14.

As best illustrated in Figure 4, bars 40 are secured to the inner surfaces of the other two sides of the band 26 each by a pair of suitable fastenings 19 which extend through the ends of said bars. The inner sides of the intermediate portions of the bars 40 are recessed to combine with the adjacent portions of the band 26 to form slots 41 through which the spring strips 25 slidably extend. The lower free ends of the resilient strips 25 terminate between the bands 26 and 28 and are flared outwardly, as seen at 25a.

A pair of rods 42 have corresponding ends secured to the inner surface of each of two sides of the band 26, as by welding, as seen at 21, and said ends of the two pairs of rods 42 straddle the secured ends of the bars 30. The two pairs of rods 42 extend slidably through the band 28 and are secured at their opposite ends as by welds 21 to the inner surfaces of opposite sides of the band 29. Bars 43 have complementary ends secured by fastenings 19 to the inner surfaces of opposite sides of the band 28 between the rods of the pairs of rods 42. The terminals of the bars 43, located

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adjacent the band 28, are chamfered or beveled on their inner sides, as seen at 43a in Figure 5. The bars 43 extend from the band 28 and slidably between the rods 42 and slidably through the band 29 and are secured by fastenings 19 to the inner surfaces of opposite sides of the lower band 27. Rods 44 are secured as by means of welds 21 adjacent corresponding ends thereof to inner surfaces of opposite sides of the band 26 and straddle the bars 41, as illustrated in Figure 4. Relatively short terminal portions of the rods 44 extend upwardly toward the terminal portions 22 of the rods 20 and likewise terminate in outturned terminals 44a. The rods 44 extend downwardly from the band 26 slidably through the band 28 and are welded or otherwise suitably secured to the band 29. Pairs of rods 45 are welded or otherwise secured to the inner surface of opposite sides of the band 28 and extend downwardly therefrom slidably between the rods 44 and slidably through the band 29 and are welded or otherwise secured near their lower ends to inner surfaces of the lower band 27. The rods 45 have lower terminal portions extending downwardly or outwardly from the band 27 and which are outturned as seen at 45a. The bars 43 have lower terminal portions extending downwardly from the band 27 and corresponding to the lower terminal portions of the bars 18. Spring strips 46, corresponding to the spring strips 25, are secured by fastenings 19 to the band 27 on the inner side thereof and between the rods 45 and extend downwardly from the intermediate section 14.

The lower discharge section 15 includes an upper band 47 and a lower band 48. The bands 47 and 48 correspond with the bands previously described and are connected by bars 49 and 50 having flared outer ends 51 which are secured to inner surfaces of opposite sides of the band 48 by fastenings 19. Portions of the bars 49 and 50, spaced from the opposite ends thereof are secured by other fastenings 19 to inner surfaces of opposite sides of the inner or upper band 47. Pairs of rods 52 are secured to the inner surfaces of the other two opposite sides of the bands 47 and 48, said rods 52 having complementary ends terminating at the band 48 and opposite outwardly flared ends 52a extending upwardly from the inner band 47 to adjacent the rod terminals 45a. The rods 52 are secured by welds 21 to the bands 47 and 48, as seen in Figure 7. As best illustrated in Figure 7, bars 53, corresponding to the bars 40, are secured by fastenings 19 to inner surfaces of opposite sides of the inner band 47 between the rods 52 and provide slots through which the spring strips 46 slidably extend, as clearly illustrated by the bars 40 in Figure 4 and as previously described. The spring strips 46 have outwardly flared terminals 46a. The discharge section 15 is curved forwardly from adjacent its inner end to its outer end, the outer side of the front bar 49 being concavely bowed and the outer side of the rear bar 50 being convexly bowed, as best illustrated in Figure 7. The rods 52 are likewise similarly curved as illustrated in Figures 1 and 7. A mounting bracket or plate 54 is secured as by means of welds 21 to the outer rear side of the bar 50, longitudinally thereof and adjacent the inner band 47 and said bracket is provided with a fastening receiving opening 55. The bars 49 and 50 have straight upper ends projecting from the upper band 47, which upwardly projecting portions correspond with the bars 30 and in combination with the lower ends of the bars 43 carry the elements as previously described forming the ball bearing knee joints 39 and which are illustrated in Figure 10, the ball bearing knee joints connecting the bars 43 to the bars 49 and 50 and connecting the discharge section 15 to the lower end of the extensible intermediate section 14, being designated generally 56. As the knee joints 56 correspond in all respects to the knee joints 39, previously described in detail, a further description thereof is considered unnecessary.

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From the foregoing it will be readily apparent that the upper inlet end of the chute 12, as defined by the band 16, can be secured in a stationary position to the outlet of a hopper or other suitable source of supply, not shown, of cans, cartons, boxes or other similar containers, and the bracket 54 can be secured to suitable reciprocating traversing mechanism, such as disclosed in my prior patent, No. 2,639,823, for example, so that the discharge end of the chute as defined by the band 48 will be located above the upper or forward side of an inclined wall or surface on to which the containers are to be stacked in courses. It will be obvious that the discharge section will be held rigidly with respect to the reciprocating traversing mechanism by attachment of the bracket 54 thereto, so that said section 15 will travel with the traversing mechanism while the upper inlet section 13 will remain stationary. As the section 15 travels in either direction away from a position directly below the section 13, the intermediate extensible section 14 will be extended by the bands 28 and 29 sliding toward one another and away from the bands 26 and 27 and with the rods 42 and 44 which are secured to the bands 26 and 29 sliding relatively to the rods 45 and bars 43 which are secured to the bands 27 and 28. Likewise, as the discharge section 15 travels toward a position directly beneath the inlet section 13, the intermediate section 14 will be retracted by the band 29 and the parts fixed thereto moving toward the band 27 and away from the band 28 and said band 28 and the parts fixed thereto moving toward the band 26 and away from the band 29. It will also be apparent that the knee joints 39 and 56 will be flexed or rocked during such movement and the spring strips 25 and 46 will likewise flex and slide relatively to the bands 26 and 47, respectively. Said strips 25 and 46 will provide rounded surfaces through which the containers, not shown, may readily slide between the sections 13 and 14 and the sections 14 and 15 when said sections are disposed at angles to one another, as illustrated in Figure 2. The outturned terminals of the rods located adjacent the knee joints will likewise function to prevent any obstruction of the sliding gravity feed of the containers through the chute sections in any flexed position of the sections relatively to one another. As certain of the rods extend into the spaces between the chute sections and adjacent the knee joints, it will be readily obvious that the chute section parts will provide no obstruction to the free sliding movement of the containers through the chute.

Obviously, the chute sections may be made of various cross sectional sizes and shapes so long as the cross sectional size and shape of the three sections are uniform for each chute, to thereby accommodate containers of different sizes and shapes and to insure free sliding movement of the containers through the chute. The chute 12 is made of a size and shape to have a sufficiently close fitting engagement with the containers to prevent any canting or rocking of the containers while moving through the chute.

Various modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. A gravity feed chute for containers comprising an inlet section, an outlet section and an intermediate section interposed between and connected to inner adjacent ends of the inlet section and outlet section to combine therewith to form a continuous chute, means forming knee joints pivotally connecting the ends of the intermediate section to the adjacent ends of said inlet and outlet sections and permitting movement of the intermediate section and outlet section relatively to the inlet section, said sections being of openwork construction and having bars forming portions of opposite sides thereof, said bars of the intermediate section extending beyond

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end portions thereof and said bars of the end sections extending beyond the inner ends thereof, and said extending ends of the bars of the end sections and of the intermediate section constituting parts of said knee joint forming means.

2. A chute as in claim 1, ball bearings forming parts of said knee joints, and clamping means for adjustably tightening the knee joints for adjusting the flexibility thereof.

3. A chute as in claim 2, leaf springs forming parts of the other sides of the inlet section and extending to beyond the inner end thereof, means slidably connecting said leaf springs to the adjacent end of the intermediate section, leaf springs forming a part of other sides of the intermediate section and extending to beyond a lower end thereof, means slidably connecting said last mentioned leaf springs to the adjacent end of said outlet section, and said leaf springs of both the inlet section and intermediate section being laterally spaced from the axes of the knee joints for flexing therewith.

4. A chute as in claim 3, rods forming parts of said last mentioned sides of the chute sections and including terminal portions extending to adjacent the knee joints and straddling said leaf springs, said terminal portions of the rods being flared outwardly with respect to the chute sections.

5. A gravity feed chute for containers comprising an inlet section, an outlet section and an intermediate section interposed between and connected to inner adjacent ends of the inlet section and outlet section to combine therewith to form a continuous chute, means forming knee joints pivotally connecting the ends of the intermediate section to the adjacent ends of said inlet and outlet sections and permitting movement of the intermediate section and outlet section relatively to the inlet section, said chute sections being of openwork construction and each including spaced encompassing bands, bars extending longitudinally of each chute section and connected to the bands thereof and forming front and rear walls, rods extending longitudinally of each chute section and connected to the bands thereof and forming side walls of the section, and said bars and rods being secured to inner sides of the bands.

6. A chute as in claim 5, the bars of the front and rear walls having extensions forming parts of the knee joint forming means.

7. A chute as in claim 6, and spring strips extending between the adjacent ends of the chute sections, each of said spring strips forming a part of a side wall of the

chute and being secured to the inner side of a band of one of the sections and slidably engaging the inner side of the band of another of the sections.

8. A gravity feed chute for containers comprising an inlet section, an outlet section and an intermediate section interposed between and connected to inner adjacent ends of the inlet section and outlet section to combine therewith to form a continuous chute, means forming knee joints pivotally connecting the ends of the intermediate section to the adjacent ends of said inlet and outlet sections and permitting movement of the intermediate section and outlet section relatively to the inlet section, said intermediate section being of openwork construction and including end bands and two intermediate bands, bars and rods extending through said bands and combining therewith to form front, rear and side walls of said intermediate chute section, said bars and rods each being secured to two of the bands and each having sliding engagement with a third band interposed between said two bands for providing a telescopic construction whereby said intermediate chute section is extensible and retractable.

9. A chute as in claim 8, said outlet section including a front wall, a rear wall and side walls and being of openwork construction, said outlet section being bowed longitudinally and forwardly with respect to the front and rear walls of said intermediate section whereby the outlet end of the outlet section opens downwardly and forwardly of the chute.

10. A chute of the character described comprising an extensible telescoping intermediate section, an inlet end section and outlet end section, said sections being of substantially the same cross sectional size and shape, said chute sections being of openwork construction and including front walls, rear walls and side walls, portions forming parts of said front and rear walls of the sections having extensions extending between adjacent ends of adjacent sections, and means carried by said portions and forming interconnecting knee joints located between the adjacent ends of the end sections and the ends of said intermediate section.

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