

Aug. 16, 1955

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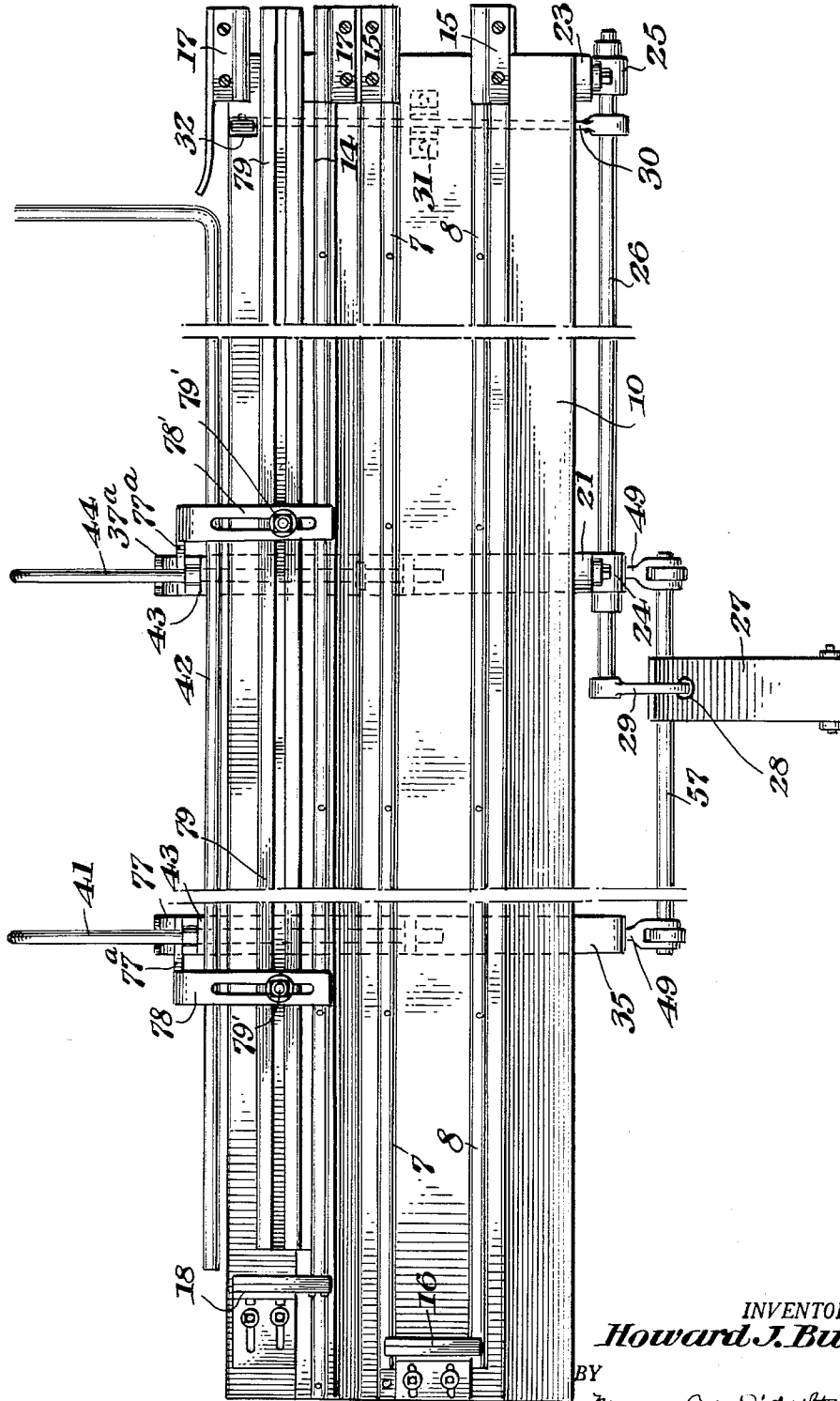
2,715,469

TIERING STATION FOR BULK PACKING CANS

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4 Sheets-Sheet 1

Fig. 1.



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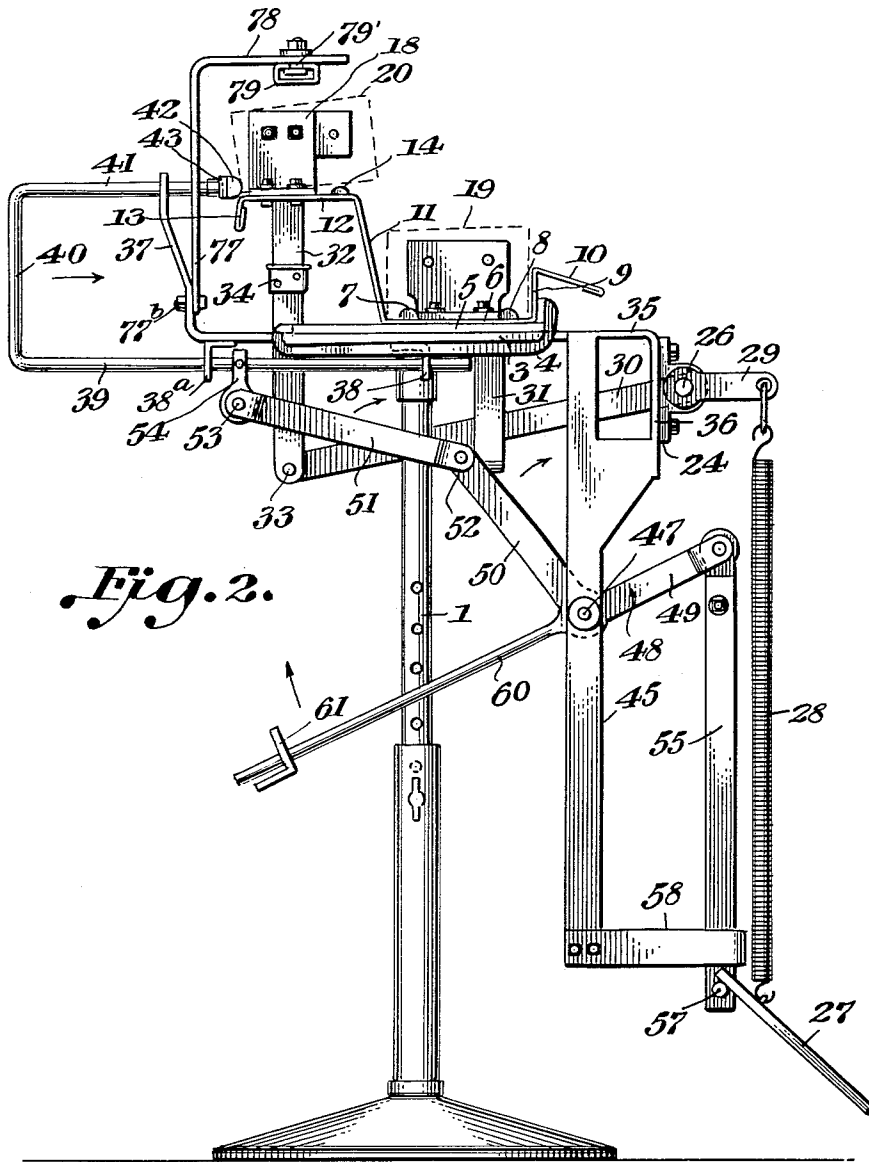


Fig. 2.

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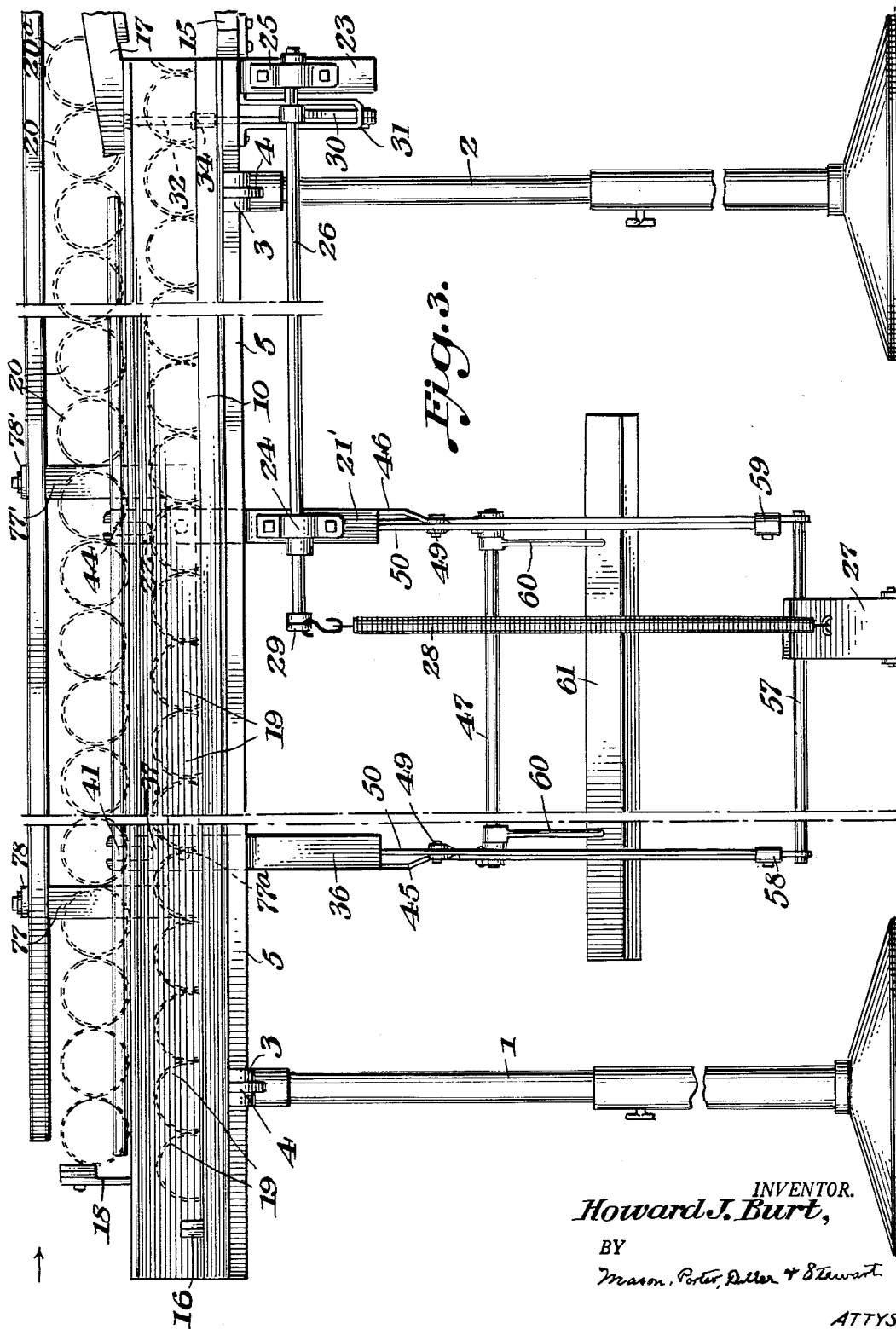
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Fig. 4.

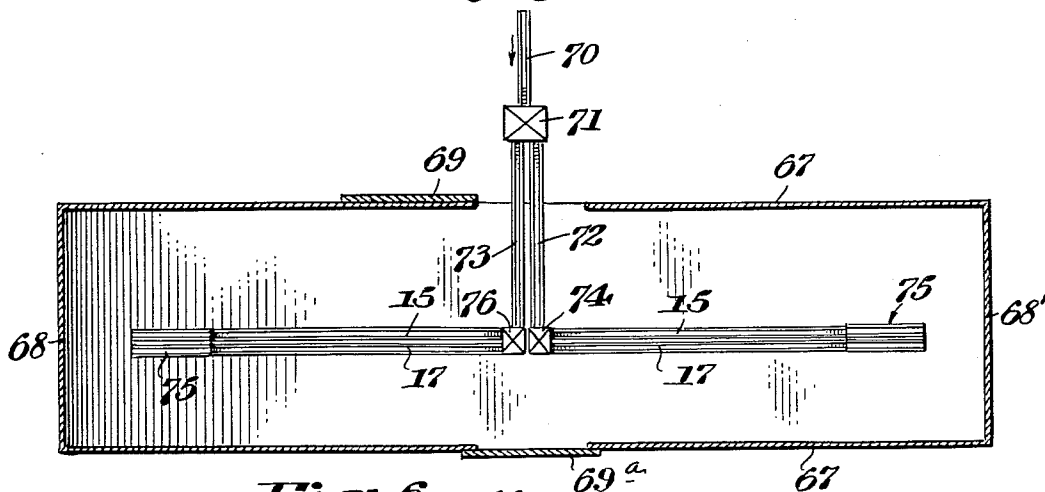


Fig. 6.

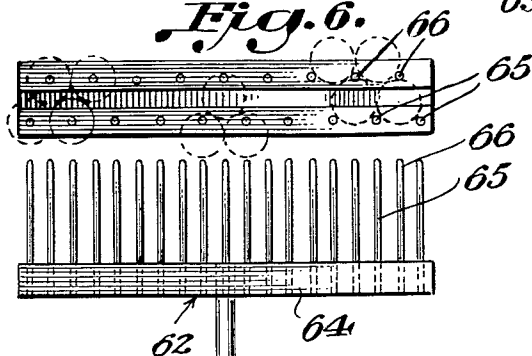


Fig. 7.

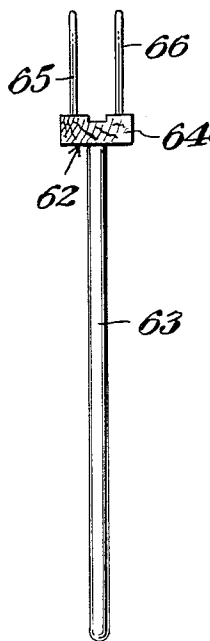


Fig. 5.



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TIERING STATION FOR BULK PACKING CANS

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Application April 6, 1954, Serial No. 421,243

7 Claims. (Cl. 214-6)

The invention relates to new and useful improvements in an apparatus for loading cans in tiers one on another in staggered relation in a vehicle for transporting the same, or in a storage room.

An object of the invention is to provide a can grouping apparatus wherein there is means for forming at least two groups of cans, one placed above the other in a staggered relation preparatory to the transferring of said groups to storage stacks.

A further object of the invention is to provide a can grouping apparatus of the above type wherein the cans are delivered to the apparatus by gravity and wherein the can groups are formed and positioned relative to each other so that one group can be shifted endwise onto the other group and in staggered relation thereto preparatory to the lifting of both groups from the apparatus and placing the same in storage or shipping stacks.

A still further object of the invention is to provide a fork with tines arranged in groups one above the other and in staggered relation so that the forked tines may be entered into or between the individual cans of the two groups for the lifting of the same.

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

In the drawings:

Figure 1 is a plan view of the grouping apparatus embodying the invention.

Figure 2 is an end view of the same, said end view being taken from the left hand side of Figure 1.

Figure 3 is a front view of the apparatus.

Figure 4 is a diagrammatic view showing a vehicle compartment such as a box car in which cans are loaded for transportation, also showing diagrammatically the runways for directing the cans into a grouping apparatus at each end of the compartment.

Figure 5 is a plan view of a fork for lifting the groups of cans.

Figure 6 is an end view looking longitudinally of the tines of the fork and showing cans in which the tines are centered preparatory to contacting the cans individually and lifting the two groups for placing the same in stacks.

Figure 7 is an end view of the can lifting fork.

In Figure 3, of the drawings, there is shown the improved apparatus as viewed from the front of the machine. The apparatus includes two standards 1 and 2 carrying brackets 3, 3 at their upper ends. Each bracket is provided with a strengthening rib 4, 4. Mounted in the brackets is a plate 5 which extends from end to end of the apparatus. The group forming and shifting device is mounted on this supporting plate 5.

A thin metal plate 6 is attached to the plate 5. Parallel tracks 7 and 8 are attached to this plate 6. These tracks are half round and the flat side is placed against the plate 6. This plate 6 is bent upwardly at 9 so as to retain the cans on the track as they roll along the same. The plate also has a lateral overhanging, downwardly inclined apron 10. At the other side of the track 7 the

plate is bent upwardly and rearwardly as indicated at 11. It is then bent horizontally as indicated at 12 and the rear side of the plate is folded downwardly and hemmed as at 13 in order to strengthen the supporting portion 12. Mounted on the upper face of this horizontal portion 12 and at the front side thereof is a track 14. There is no track at the rear side of the plate for reasons hereinafter stated.

The can bodies are delivered from a downwardly inclined runway 15 onto the tracks 7 and 8 and they are pushed along the track to the end thereof where the advanced can contacts the stop 16. The cans are delivered from an inclined runway 17 onto the track 14 at one end of the can bodies and onto the supporting plate at the other end. There is a stop 18 which the advance can in the upper group contacts. These stops 16 and 18 are so disposed that the cans when contacting therewith in the upper group will be staggered relative to the lower group. The cans in the lower group are indicated in broken lines at 19 in Figure 3 and in broken lines in Figure 2. The cans in the upper group are indicated in broken lines at 20 in Figure 3 and in broken lines in Figure 2. Mounted on the underside of the supporting plate 5 is a bracket 21 which has a depending portion 21' at its front end and an upstanding portion 37^a at its rear end. There is another bracket 23 adjacent the receiving end of the apparatus. This bracket is also attached to the underside of the plate 5. Attached to the bracket 21 is a bearing 24 and attached to the bracket 23 is a bearing 25. A shaft 26 is mounted in these bearings for oscillation. There is a treadle 27 to which a spring 28 is connected. The spring 28 is attached to an arm 29 at its upper end and this arm is rigidly mounted on the end of the shaft 26. Fixed to the shaft 26 is a rearwardly extending arm 30 which extends between the side members of the U-shaped bracket 31 which is bolted to the underside of the plate 5. A vertically extending can divider 32 is pivoted at 33 to the lever 30. This divider extends up through a slot in the plate 12 and is adapted when moved upwardly to pass between the cans 20 forming the upper group and the cans 20^a remaining in the runway. This divider off a group of cans which can be shifted from the upper runway onto the cans of the lower runway and the divider will hold back the cans in the gravity feed chute until after the shifting of the group of cans has been completed. When the operator releases the treadle the divider will move downward to its retracted position and in this position the cans are free to run from the gravity feed runway 17 onto the track 14 and the plate 12 to form another group of cans.

There is a stop sleeve 34 mounted on the divider and said stop sleeve has a flange which engages the underside of the plate 12 and limits the upward movement of the divider.

There is a third bracket 35 secured to the underside of plate 5. Said bracket has a depending portion 36 at the front side thereof and an upstanding portion 37 at the rear thereof (see Figure 2). There are spaced lugs 38 and 38^a attached to the underside of the bracket 35 and a rod 39 is mounted in these lugs for free sliding movement endwise thereof. The rod 39 is bent upwardly at 40 and thence inwardly at 41. Mounted on the inner end of the rod 41 is a shifting or transfer rod 42. This rod has a flat side at the rear thereof which is welded to the bracket plate 43. There is a second rod 44 which is similar to the rod 39 which rod is mounted in lugs carried by bracket 21. This rod also extends upwardly similar to the upwardly extending portion 40 of the rod 39 and then inwardly similar to the section 41 of said rod 39. This rod 44 at the end of the inwardly extending section similar to 41 carries a plate which is welded to the trans-

fer rod 42. Thus the rod 42 is supported by these two rods mounted for sliding movement in lugs carried by the brackets 21 and 35. This rod is located adjacent the lower end of the cans 20 in the upper group.

When the rod is moved to the right as viewed in Figure 2 it will engage the cans 20 and move them off from the upper supporting track in an endwise direction onto the lower group of cans 19. The upper group of cans is supported as noted above on the track 14 at the front end thereof and on the supporting plate 12. This places the individual cans of each group in a slightly inclined position and facilitates the movement of the upper group over and onto the lower group.

The bracket 35 has a depending member 45. The bracket 21 likewise has a depending member 46. A shaft 47 is journaled in these depending members 45 and 46. Mounted on the shaft adjacent each end thereof are rock levers 48. These rock levers are arranged adjacent the depending supports 45 and 46 and are fixed firmly to the shaft. The rock levers are alike in construction and each has a forwardly projecting arm 49 and a rearwardly projecting arm 50. A link 51 is pivoted at 52 to the arm 50. The other end of the link is pivoted at 53 to a lug 54 rigidly attached to the rod 39. There is a link similar to the link 51 which is connected to the arm 50 of the other rock lever and said link is connected to a lug on the rod 44. When the rock lever is turned in a clockwise direction it will cause the rods 39 and 44 to slide endwise in their supporting lugs 38 and 38^a and to the right as viewed in Figure 2. This causes the rod 42 to contact the ends of the cans in upper row and the lateral movement of the rod will move all of the cans in the upper group endwise off from the track 14 and onto the lower group of cans 19. Inasmuch as the cans are initially positioned so that they are in staggered relation to each other the upper group of cans will fall onto the lower group of cans in staggered relation relative to the cans in said lower group. Pivoted to the outer end of the arm 49 is a depending bar 55. There is a similar bar 56 attached to the other rocker. A rod 57 connects the lower ends of these bars 55 and 56. The rod 55 slides in a guide arm 58 which is rigidly secured to the lower end of the depending bracket member 45. The bar 56 slides in a similar guiding member 59. The treadle 27 rests on the bar 57 and when the treadle is depressed it will pull down on the bars 55 and 56 and this will oscillate the rockers 48, 48 attached to the opposite ends of the shaft 47. There are arms 60 rigid with the shaft 47 and these arms carry a weight 61.

When the treadle is depressed the spring 28 will raise the can divider so as to separate a certain number of cans from the gravity fed cans. This forms the upper group. The same movement of the treadle will oscillate the shaft 47 and this will move the rod 42 toward the right as viewed in Figure 2. The rod will simultaneously engage the ends of the entire separated group of cans and move them endwise off their supporting tracks so that they will fall off onto the cans in group 19. The individual cans in the two groups will, as already noted, be staggered relative to each other.

The upstanding portion 37 of the bracket 35 is provided with a slot at the upper end thereof and the rod 41 extends through this slot and is guided by this upstanding member. The upstanding member 37^a of the bracket 21 is likewise slotted and the rod 44 extends through this slot and is guided thereby.

Secured to the upstanding member 37 is a bracket 77. This bracket extends above the row of cans in the upper group and is bent inwardly over the upper row of cans as indicated at 78. This bracket 77 has a laterally extending portion 77^a shown in dotted lines in Figure 3 and this laterally extending portion 77^a may be bolted to the upstanding portion 37 by a bolt 77^b or in any other desired way such as welding. There is an upstanding bracket 77' secured in a similar manner to the bracket

21. This bracket 77' has a laterally extending portion 78'. Bar 79 is attached to these brackets 78 and 78' and this bar extends from one end of the apparatus to the other and serves to prevent the cans in the upper group from rolling up on top of one another. The bar 79 is formed from a sheet of metal which is bent upwardly and thence inwardly. The inwardly extending portions are spaced so that a bolt 79' may pass therethrough for securing the bar to the bracket 78. The standards 1 and 2 are made in telescoping parts which are adjustable one on the other so that the group forming apparatus may be bodily raised or lowered to suit the convenience of the operator.

A can transfer fork 62 is provided with a handle 63 carrying a shank 64 in which are supported two rows of tines. The tines in the lower row are indicated at 65 and the tines in the upper row are indicated at 66. The fork is placed in front of the assembled groups and inserted in the cans simultaneously. There is a tine for each can and after the tines have been inserted in the cans the fork is lifted and the tines will contact with the upper portion of the cans and the two groups may be thus lifted simultaneously and placed in stacks or tiers. The entering of the tines into the cans and the lifting of the same has been illustrated in broken lines at the center and at the left in Figure 6. Another way of lifting the groups is to place the tines in the spaces between the cans in the groups as illustrated at the right in Figure 6.

In Figure 4, there is indicated diagrammatically a compartment in which the cans are to be stacked which compartment may be the interior of the body portion of a box car having side walls 67, 67 and end walls 68, 68'. The car has central openings which may be closed by sliding doors 69, 69^a. In this Figure 4 a gravity feed line 70 extending from the plant to a point adjacent the door feeds cans into a divider 71 which is of the usual construction. Passing from the divider will be two lines of cans. One line will be fed into the gravity runway 72 and the other line will be fed into the gravity runway 73. The runway 72 delivers the cans to another form of can line divider of a well known type. From this divider 74 there are two gravity lines 15 and 17 which feed the cans into the group forming apparatus indicated as a whole at 75. An operator with his transfer fork takes the cans from this grouping apparatus and places them in stacks at the end of the car. The gravity lines 15 and 17 may be lengthened or shortened in the usual well-known way so that as the compartment fills up the grouping apparatus can be moved towards the center of the car. There is a similar divider 76 which is served by the gravity feed runway 73 and leading from this divider 76 are the gravity feed lines 15 and 17 feeding another grouping apparatus likewise indicated as a whole at 75. A second operator with his transfer fork takes the cans from this group forming apparatus and stacks them in the other end of the compartment.

The cans are delivered to the grouping apparatus by suitable inclined runways along which the cans roll by gravity. There is a separate gravity feed chute for each group forming section of the apparatus. The cans roll into the runways of the apparatus until they come in contact with the stops. Being gravity fed the cans may be stopped for the purpose of removing groups of the cans from the apparatus. These stopping devices are so arranged that when the can bodies stop in the apparatus the cans in the upper group are staggered relative to the cans in the lower group. A can divider is raised by the operator so as to cut off a predetermined number of cans to form the upper group. This divider is raised by depressing a treadle and when the treadle is released there is a weight which retracts the divider. The divider is held raised by the operator until the two groups are arranged one on top of the other and the operator has

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inserted the tines of the transfer fork and lifted the cans so that the cans in the gravity fed chute can roll forward to again form groups. The operator manually shifts the transfer rod for moving the upper group over and onto the lower group. This is accomplished through the same treadle which lifts the divider. When the treadle is released the weight 61 will return the shifting rod to its initial position so that the cans are free to roll underneath the guide bar 79 until the upper group of cans is completed. There is no divider for the lower group of cans for the reason that the rolling of the cans in the lower group will be stopped when the stop member 16 is contacted by the cans and the lower group remains in contact with this stop until the operator lifts the group from the tracks 7 and 8. When the operator lifts the two groups of cans by his transfer fork he then releases the treadle and the moving parts are restored to their initial position thus permitting the cans to roll by gravity into the grouping apparatus and new groups are formed.

It is obvious that many changes in the details of construction may be made without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. An apparatus for forming groups of cans for transfer to a stack comprising two can runways arranged side by side with the bottom of one runway disposed in a horizontal plane above the cans in the other runway, means for feeding cans into said runways, stopping devices for each runway for stopping the flow of cans into said runways, said stopping devices being disposed so that the cans in one row are staggered relative to the cans in the other row, a divider for cutting off a predetermined number of cans in the upper runway, and means engaging the ends of the cans in the group on the upper runway for simultaneously shifting said group of cut-off cans from its runway onto the cans in the lower runway.

2. An apparatus for forming groups of cans for transfer to a stack comprising two can runways arranged side by side with the bottom of one runway disposed in a horizontal plane above the cans in the other runway, means for feeding cans into said runways, stopping devices for each runway for stopping the flow of cans into said runways, said stopping devices being disposed so that the cans in one row are staggered relative to the cans in the other row, a divider for cutting off a predetermined number of cans in the upper runway, treadle operated devices for yieldingly raising said divider, and means engaging the ends of the cans in the group on the upper runway for simultaneously shifting said group of cut-off cans from its runway onto the cans in the lower runway.

3. An apparatus for forming groups of cans for transfer to a stack comprising two can runways arranged side by side with the bottom of one runway disposed in a horizontal plane above the cans in the other runway, means for feeding cans into said runways, stopping devices for each runway for stopping the flow of cans into said runways, said stopping devices being disposed so that the cans in one row are staggered relative to the cans in the other row, a divider for cutting off a predetermined number of cans in the upper runway, and means engaging the ends of the cans in the group on

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the upper runway for simultaneously shifting said group of cut-off cans from its runway onto the cans in the lower runway, said last-named means including manually operated devices for shifting said group.

4. An apparatus for forming groups of cans for transfer to a stack comprising two can runways arranged side by side with the bottom of one runway disposed in a horizontal plane above the cans in the other runway, means for feeding cans into said runways, stopping devices for each runway for stopping the flow of cans into said runways, said stopping devices being disposed so that the cans in one row are staggered relative to the cans in the other row, a divider for cutting off a predetermined number of cans in the upper runway, treadle operated devices for yieldingly raising said divider, and means engaging the ends of the cans in the group on the upper runway for simultaneously shifting said group of cut-off cans from its runway onto the cans in the lower runway, said last named means including manually operated devices for shifting said group.

5. An apparatus for forming groups of cans for transfer to a stack comprising two can runways arranged side by side with the bottom of one runway disposed in a horizontal plane above the cans in the other runway, means for feeding cans into said runways, stopping devices for each runway for stopping the flow of cans into said runways, said stopping devices being disposed so that the cans in one row are staggered relative to the cans in the other row, a divider for cutting off a predetermined number of cans in the upper runway, a treadle and devices operated thereby to raise said divider, and devices operated by said treadle for shifting said upper group of cans onto said lower group of cans.

6. An apparatus for forming groups of cans for transfer to a stack comprising two can runways arranged side by side with the bottom of one runway disposed in a horizontal plane above the cans in the other runway, means for feeding cans into said runways, stopping devices for each runway for stopping the flow of cans into said runways, said stopping devices being disposed so that the cans in one row are staggered relative to the cans in the other row, a divider for cutting off a predetermined number of cans in the upper runway, a treadle and devices operated thereby to raise said divider, devices operated by said treadle for shifting said upper group of cans onto said lower group of cans, and means for returning said divider and said group shifting devices to initial position when the treadle is released.

7. An apparatus for forming groups of cans for transfer to a stack comprising two can runways arranged side by side with the bottom of one runway disposed in a horizontal plane above the cans in the other runway, means for feeding cans into said runways, stopping devices for each runway for stopping the flow of cans into said runways, said stopping devices being disposed so that the cans in one row are staggered relative to the cans in the other row, a divider for cutting off a predetermined number of cans in the upper runway, and means engaging the ends of the cans in the group on the upper runway for simultaneously shifting said group of cut-off cans from its runway onto the cans in the lower runway for positioning said groups to receive the tines of a stacking fork for simultaneously carrying the cans and placing the groups in a stack.

No references cited.