L. D. MANCHESTER.

AUTOMATIC TRANSFER MECHANISM FOR CONVEYERS.

APPLICATION FILED MAY 21, 1910.

1,112,816.

Patented Oct. 6, 1914.

2 SHEETS—SHEET 1.

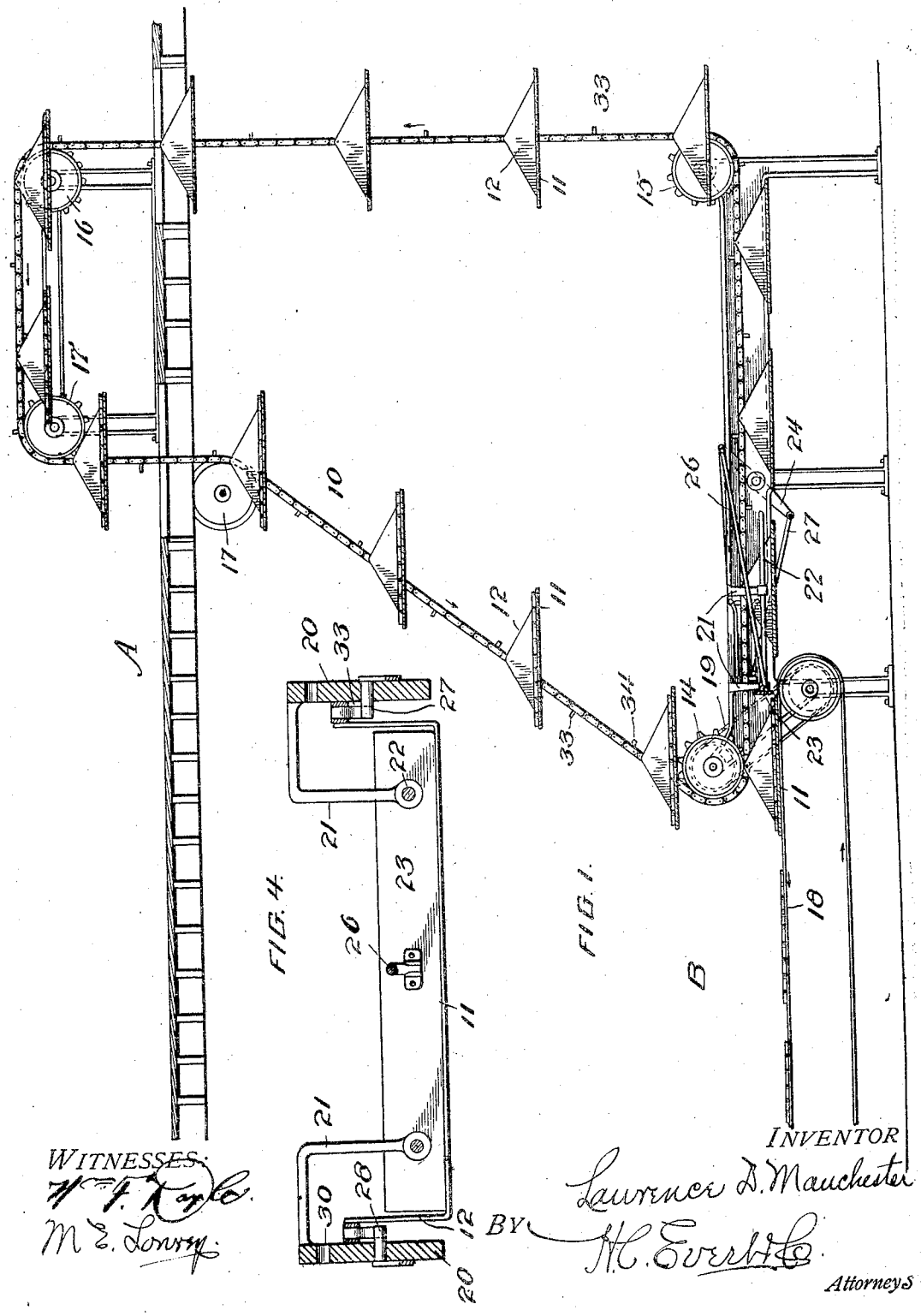



FIG. 1.

FIG. 4.

WITNESSES:

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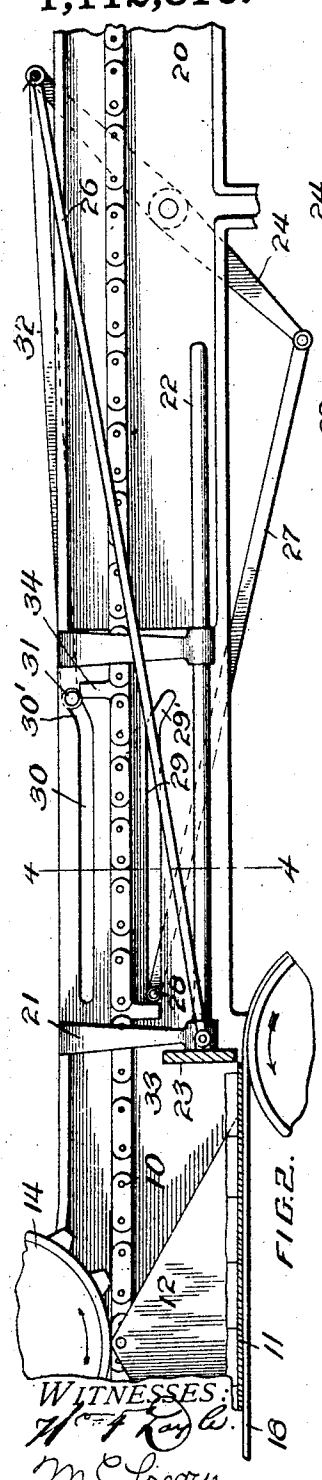


FIG. 2.

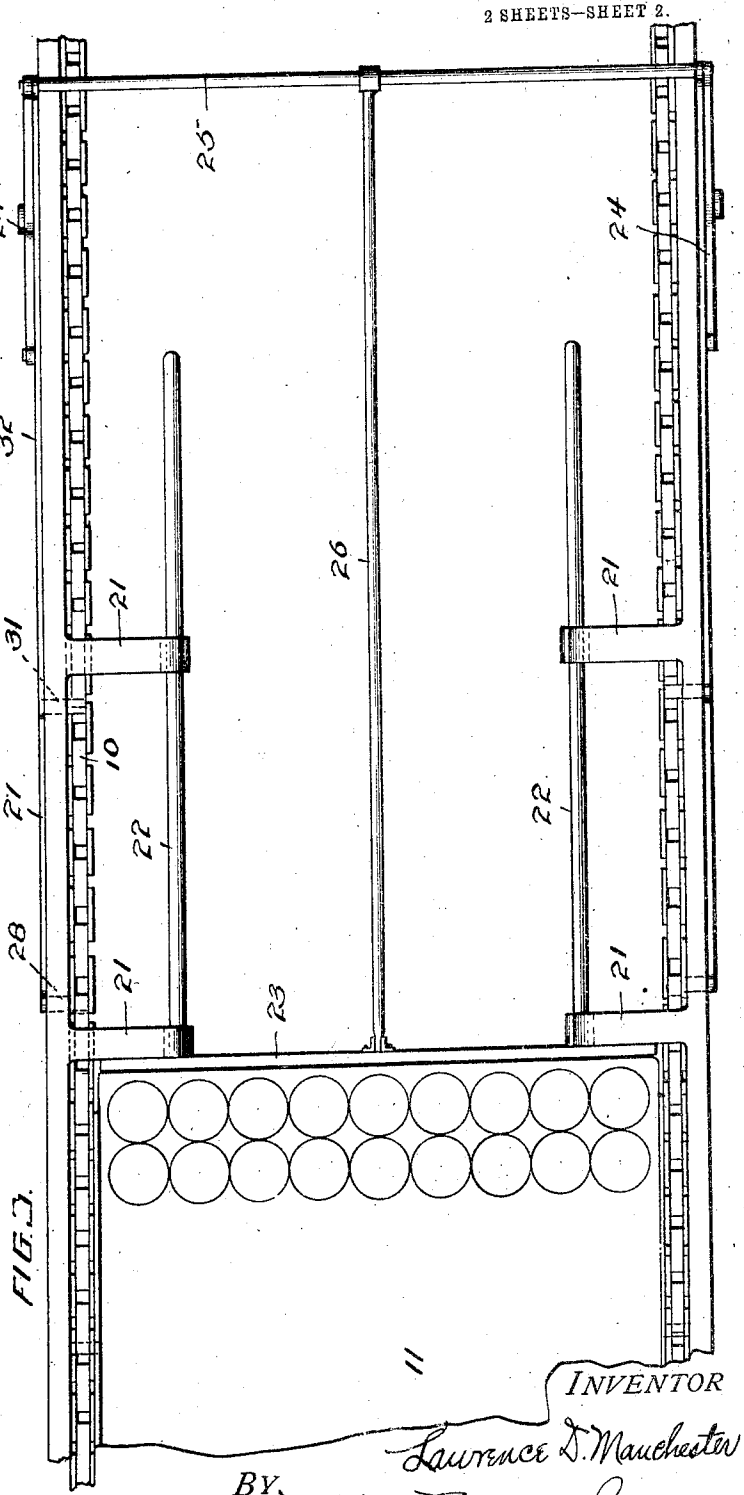


FIG. 3.

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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC TRANSFER MECHANISM FOR CONVEYERS.

1,112,816. Specification of Letters Patent. Patented Oct. 6, 1914.

Application filed May 21, 1910. Serial No. 562,777.

*To all whom it may concern:*

Be it known that I, LAWRENCE D. MANCHESTER, a citizen of the United States of America, residing at Sioux Falls, in the county of Minnehaha and State of South Dakota, have invented certain new and useful Improvements in Automatic Transfer Mechanism for Conveyers, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to certain new and useful improvements in automatic transfer mechanism for conveyers, and relates more specifically to means for automatically transferring crackers, cakes, etc., from one traveling belt or conveyer to another traveling belt or conveyer while the belts or conveyers are traveling in different directions, and is particularly designed and adapted for use in bakeries for the handling with a minimum amount of breakage of those crackers known commercially as "soda crackers". In bakeries, such products as soda crackers, oyster crackers and like brittle or fragile goods are termed "shelf" goods because they are generally baked directly upon the shelves of the oven, and are raked out into baskets or other suitable receptacles in the case of oyster crackers, or taken out in sheets as in the mode of handling soda crackers. Any "shelf" goods are taken from the machine where they are formed ready for baking in sheets in which the individual crackers are slightly attached to all the adjoining crackers. This is to facilitate the handling of the goods into and out of the oven. With such goods as oyster crackers, no care is required to be exercised in removing the crackers from the shelves, since it is not intended that they be retained in sheets after being baked. But with such goods as soda crackers, it is imperative that the sheets of baked crackers reach the packers with a minimum amount of breakage of the sheets, that packing may be materially facilitated. In general practice, a wooden shovel termed in the trade a "peel" is used for placing the sheets of unbaked crackers on the oven shelves, which operation is termed "peeling". The ordinary "peel" of crackers is usually about 20 to 36 inches in size and the standard oven shelf will hold six "peels" of sheets of crackers. When baked, the sheets are peeled out of the oven without breaking of the sheets. It is the usual custom to start at one end of the oven shelf and raise the first sheet of crackers, placing it on the second sheet, and then raise these sheets placing them on the third sheet, then placing the "peel" under the three sheets of crackers and drawing them from the oven. In bakeries where the packing is on a separate floor from the baking, it is the custom to place the "peels" of crackers upon trays or shallow pans a little larger than the sheets of crackers. These trays are sometimes placed on special racks which are conveyed to the packing floor on ordinary elevators, or in some bakeries, the trays are conveyed to the packing floor with specially constructed tray conveyers that in some instances return the empty trays automatically to the baking floor.

It is the broad object of my invention to overcome the loss due to breakage and to provide means for automatically transferring the crackers, cakes or like fragile goods from the carrier which delivers them to the packing room onto a traveling receiver, and to make the transfer in such manner that all danger of breaking the crackers or disarranging same during delivery to the receiver is obviated.

Furthermore, the invention aims to obviate the cost and upkeep of the trays, as well as the expense of an extra handling of the crackers, and to deliver the crackers to the packers promptly, so that they will still be in their tough state, and thereby greatly facilitate the packing, since all crackers are tough, while in their hot state and only become fragile or brittle when cold.

Without intending to confine myself to any specific form of apparatus for carrying the invention into effect, I show herein, and will describe in detail, one embodiment of the invention as it has been practised by me, so it may be understood by those skilled in the art, though it will be obvious, that it is susceptible to various changes as may be required, according to the conditions existing where it is desired to install the apparatus, for instance whether it is desired to convey the crackers from an upper to a lower floor, or vice-versa.

With reference to the accompanying drawings: Figure 1 is a longitudinal sectional view through the floor of a building and the apparatus, showing the latter arranged so as to convey the crackers from an upper to a lower floor where the receiver

or packing table is located. Fig. 2 is a detail view of the removing or transferring mechanism in longitudinal section. Fig. 3 is a plan view of the same, and, Fig. 4 is a transverse vertical sectional view through the mechanism on the line 4—4 of Fig. 2 showing the traveling cracker-pusher in elevation.

In the illustrated embodiment of the invention, I have shown the apparatus arranged to convey the crackers from an upper room as A to a lower room as B, the former of which may be designated as the baking room, and the room B as the packing room. The conveyer or carrier 10 as it will be herein termed, is of a well known form, consisting of two link belt chains to which shelves or trays 11 are attached by hangers 12 in such manner that the shelves or trays are always level during the travel of the carrier. This conveyer or carrier is disposed vertically, in the present instance being adapted to receive the crackers or other goods on the shelves or trays in room A, and carry the same to room B, where they are transferred to the receiver. The said carrier is arranged to travel over suitably-disposed sprockets as 14, 15, 16 and 17, the sprockets 14, 15 being spaced a sufficient distance apart as to provide for a considerable horizontal travel of the carrier at the lower end thereof and thus enable the automatic transfer of the goods from the carrier to the receiver as will later be described.

In the room B, is arranged the receiver 18, which is usually in the form of a suitable conveyer belt, the travel of which is away from or opposite to the horizontal portion of the travel of the carrier 10. This receiver constitutes the table from which the crackers, cakes or the like are packed into boxes or cartons by the packers, and it is extremely desirable that the goods be delivered from the carrier onto the receiver without being broken or disarranged, so as to facilitate the work of the packers. For this reason, the receiver 18 is arranged in such position with relation to the carrier, that the shelves or trays 11 will be brought directly over the receiver with the bottom of the shelves or trays in close proximity to the receiver, as illustrated in Fig. 1, so that the goods on the shelves or trays may be transferred to the receiver. The carrier and the receiver may or may not be arranged to travel at the same rate of speed as may be desired, a drive connection as 19 being provided between the carrier and receiver, and either one or the other of these traveling members being positively driven in any desired manner.

As heretofore stated, my invention resides in providing automatic means for transferring the crackers from the vertically traveling carrier to the horizontally traveling belt conveyer or receiver. To accomplish this, I provide a pusher or cracker-remover arranged to engage the crakers on the trays or shelves 11 as the latter are traveling in a horizontal plane over the receiver 18, the pusher being arranged to travel at the same rate of speed as the receiver. The pusher being movable, and arranged to travel in an opposite direction to the travel of the carrier, and at the same rate of speed as the receiver, and in the same direction as the receiver, causes the crackers to be moved onto the receiver or conveying belt without any disarrangement of the crackers from the manner in which they were disposed on the tray or shelf, and thus be delivered to the packer in proper condition for packing. In the present embodiment of the invention, I have shown this transferring mechanism as arranged to be operated by the carrier, but obviously, other means may be provided for effecting the automatic-operation of the device in conjunction with the traveling carrier and traveling receiver. As herein shown, I have provided two suitably-supported side members 20, between which the so-called vertical carrier has the horizontal portion of its travel. Each member 20 is provided with a pair of hangers 21, in each of which is mounted a guide-rod 22, which at their forward ends carry the pusher plate 23. Pivotally connected to the outer face of each member 20 is a two-armed lever or walking-beam 24, the upper ends of which are connected by a rod 25, which in turn is connected by a pitman-rod 26 with the pusher plate 23. The lower ends of the walking-beams 24 have connected thereto one end of links 27, the other ends of which carry pins 28 engaging in and adapted to ride in slots 29 provided therefor in the members 20. The major portion of these slots extend in a horizontal plane, but at their rear ends, the slots terminate in a downwardly-inclined branch 29′ into which the pins 28 ride, for a purpose as will presently appear. The side members 20 are provided directly above the slots 29 with slots 30, parallel with the slots 29 except that at the rear ends, they terminate in upwardly-inclined branches 30′, these slots receiving pins 31 carried by the forward ends of levers or links 32, connected at their rear ends with the rod 25. The chain belts of the vertically traveling carrier 10 are provided with lugs or fingers 33 and 34, disposed on opposite sides of the chain belts and arranged to engage respectively with the pins 28 and 31.

In operation, we will assume that the traveling carrier has moved so as to bring one of the shelves or trays in position directly over the conveyer belt 18, as shown in Figs. 1 and 2. When one of the shelves or trays has assumed this position, the lugs or fingers

33 on the chains adjacent the positioned shelf or tray engage with the pins 28, and, as the carrier continues its travel, the links 27 are moved rearwardly, thus rocking levers or beams 24 on their pivots, and moving the upper ends of these levers or beams forward as the lower ends thereof move rearward; the forward movement of the upper ends of these levers or beams 24 causes the pusher-plate 23 to be moved forward, through the medium of the pitman rod 26, at the same rate of speed as the receiver is traveling forward. As the pins 28 travel along the slots 29, they reach the inclined branches 29′ of said slots and ride thereinto at the same time as the pusher-plate 23 has completed its travel across the shelf or tray 11 and transferred the crackers onto the receiver 18. During the forward movement of the pusher-plate 23, the links 32 have been carried forward so that the pins 31 lie at the forward ends of the slots 30, in position to be engaged by the lugs or fingers 34 on the chain belts of the vertical carrier 10, so that as the following or succeeding tray or shelf 11 is traveling into position over the receiver 18, the pusher-plate 23 is carried rearwardly by the reverse movement of the parts above described and again positioned ready for another forward stroke to remove the crackers from the tray just brought into position. The branches 30′ of the slots 30 permit of the pins 31 riding up into said branches so that the lugs or fingers 34 pass out of engagement with the pins 31 without interfering with the travel of the carrier, in the same manner that the pins 38 drop into branches 29′ of the slots 29 and allow the lugs or fingers 33 to clear the pins 28.

The lugs or fingers 33 and 34 are so positioned on the chain belts that just as a tray or shelf has been brought into proper position over the receiver, the lugs 33 engage with the pins 28 so as to start the pusher-plate on its forward movement, and just as this shelf or tray has been cleared of crackers, the lugs or fingers 34 come into engagement with the pins 31 so as to return the pusher-plate to its initial position during the time a following or succeeding tray is traveling into position over the receiver.

It will be observed that the cracker-carrying shelves 11 of the endless conveyer 10 have a horizontal travel during the loading period and also during the unloading period. The latter period is absolutely necessary to effect the transfer of the crackers to the packing table, but the horizontal travel during the loading period need not necessarily be provided, since the attendant has, as a rule sufficient time to load the shelves as they arrive above the floor and before they begin their downward travel.

I desire to call particular attention to the fact that the pusher-plate is arranged to travel at the same rate of speed as the receiver, and by this means, no rigid obstruction is offered to the crackers during their removal from the carrier to the receiver, so that danger of breakage or disarrangement is absolutely prevented. The crackers when placed on the carrier trays or shelves are always in contact, and sometimes are baked in contact so that when placed on the trays or shelves they are slightly attached to each other; under this condition, if they came into contact with a fixed remover, they would be held still until the tray or shelf had passed from under them, and as the crackers passed onto the moving conveyer 18 they would commence to pull away from those held stationary on the tray, causing a breakage of the crackers, and disarrangement thereof from the manner in which they were placed on the trays or shelves materially interfering with the process of packing. With the remover or pusher-plate arranged to travel with the tray or shelf, but in an opposite direction, and at the same rate of speed as the carrier belt 18, such breakage and disarrangement is prevented.

With the transfer system as herein shown and above set forth, it is customary to "peel" six sheets of crackers out of the oven and directly on to one of the shelves of the vertical conveyer or carrier, instead of three sheets into a tray as heretofore described is the usual custom. This places the sheets on the belt of the packing table in stacks six deep. Each row of crackers is directly over another row and the "cuts" which mark the crackers for size are in line, which assist the packers in breaking them apart, and the packers have much better access to the crackers than is the case where the sheets are placed in trays. With the tray method, on account of the trays having sides or box construction, it is rather difficult to get out the first row of crackers, while with the belt or receiver of the present system, there is nothing to obstruct or interfere with the work of the packers. It is to be noted therefore, that with my device I dispense with the services of one man at the oven to take the loaded trays as in the old system and place them on the racks or elevator, only the services of one operator at the oven to "peel" the crackers being required, as well as eliminating the expense of the trays upon which to handle the goods under the usual system in vogue.

In the form of device herein shown and described, the conveyer is illustrated as one having continuous movement during operation, but obviously I do not confine the automatic transfer feature to such continuously moving conveyer, since the same is capable of adaptation for use in connection with a conveyer having intermittent movement,

and it will be obvious therefore that such changes as are necessary to adapt the invention to the conditions existing in the factory where it is desired to install the same may be made without departing from the spirit or scope of the invention as disclosed herein and defined by the accompanying claims.

What I claim is:

1. In combination with a vertically-disposed endless carrier provided with swinging cracker-carrying shelves and arranged to travel horizontally during a portion of its movement, a horizontally-traveling receiving belt disposed with relation to the carrier so as to receive crackers from the shelves of said carrier, and means for automatically transferring crackers from the shelves of the carrier to the receiving belt during the horizontal travel of the carrier, said transferring means and the receiving belt traveling in the same direction during the transferring operation.

2. In combination with a vertically-disposed endless carrier provided with swinging cracker-carrying shelves and arranged to move horizontally during a portion of its travel, a horizontally-traveling receiving belt disposed to travel in the opposite direction to the horizontal movement of the carrier and disposed with relation to the carrier so as to receive crackers from the carrying-shelves, and means for automatically transferring the crackers from the shelves of the carrier to the belt, said transferring means and the receiving belt traveling in the same direction during the transferring operation.

3. In a cracker conveyer, the combination with an endless carrier provided with cracker-carrying shelves, of a horizontally-traveling receiving table for the crackers, and an automatically-operating pusher-plate for transferring the crackers from the carrier to the receiving belt, said pusher-plate and receiving belt traveling in the same direction during the transferring operation.

4. In a cracker conveyer, the combination with an endless carrier provided with cracker-carrying shelves, of a horizontally-traveling receiving table for the crackers, and an automatically-operating pusher-plate for transferring the crackers from the carrier to the receiving belt, said pusher-plate and receiving belt traveling in the same direction and at the same rate of speed during the transferring operation.

5. In cracker conveying mechanism, the combination with a vertically-disposed endless carrier provided with cracker-carrying shelves and arranged to have horizontal travel during the unloading period, a horizontally-disposed traveling receiving belt, and automatically-operating means for transferring the crackers from the shelves of the carrier onto the receiving belt during the horizontal travel of the carrier, said transferring means and the receiver traveling in the same direction and at the same rate of speed.

6. In a device of the character described, the combination with a horizontal conveyer, of a vertical conveyer, carriers pivotally suspended from said vertical conveyer, said vertical conveyer having a portion thereof arranged to move said carriers in close juxtaposition to said horizontal conveyer, and means suspended over said carriers for intercepting the goods thereon, the movement of said carriers being adapted to displace said goods onto the horizontal conveyer.

In testimony whereof I affix my signature in the presence of two witnesses.

LAWRENCE D. MANCHESTER.

Witnesses:

JOHN J. LARKIN,

ERNEST H. FICKES.