S. T. HOYT AND J. S. NAPIER.

AUTOMATIC GATE FOR DELIVERY CHUTES.

APPLICATION FILED FEB. 28, 1921.

1,418,573. Patented June 6, 1922.

Fig. 1.

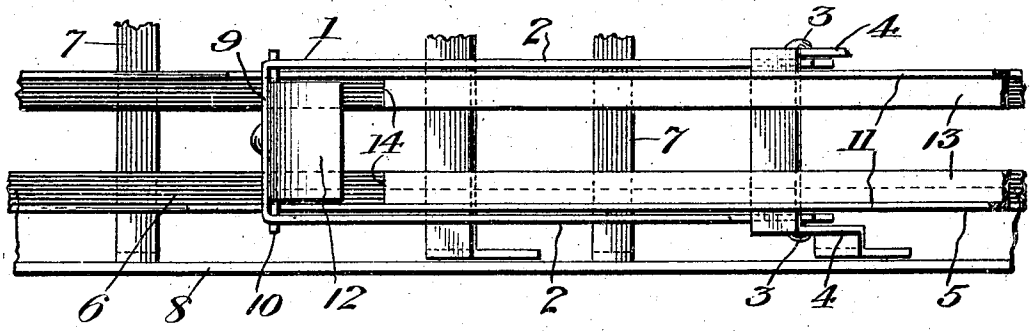


Fig. 2.

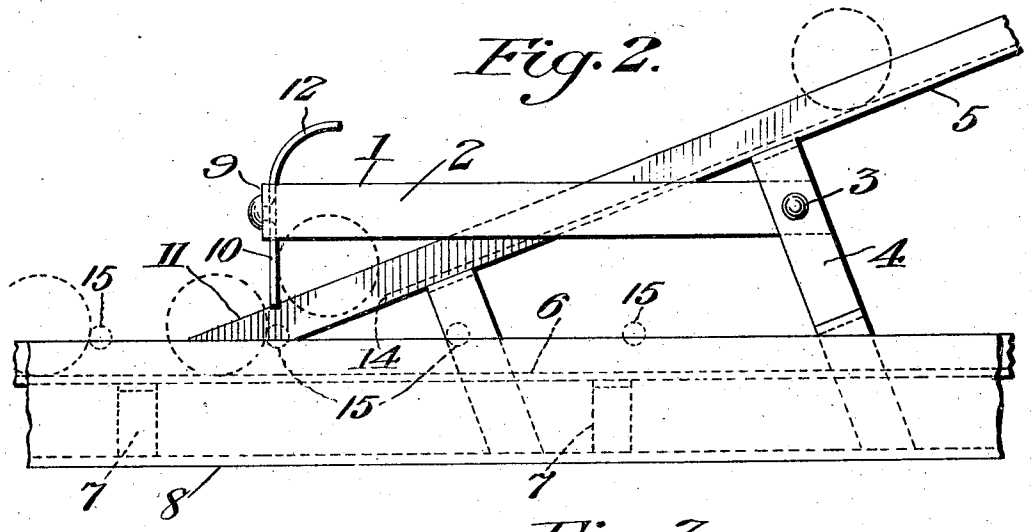
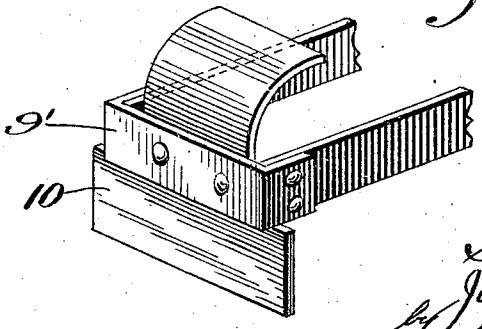


Fig. 3.



Inventor:
Simes T. Hoyt
John S. Napier
by Chas. J. O'Neill
Atty.

UNITED STATES PATENT OFFICE.

SIMES T. HOYT AND JOHN S. NAPIER, OF HONOLULU, TERRITORY OF HAWAII, ASSIGNORS TO HAWAIIAN PINEAPPLE COMPANY, LIMITED, OF HONOLULU, TERRITORY OF HAWAII.

AUTOMATIC GATE FOR DELIVERY CHUTES.

1,418,573. Specification of Letters Patent. **Patented June 6, 1922.**

Application filed February 28, 1921. Serial No. 448,716.

To all whom it may concern:

Be it known that we, SIMES T. HOYT and JOHN S. NAPIER, citizens of the United States, residing at Honolulu, Territory of Hawaii, have invented certain new and useful Improvements in Automatic Gates for Delivery Chutes; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an automatic gate for delivery chutes for admitting cans or the like on to the tracks of cookers, conveyors, coolers, and other forms of apparatus used in the canning of foods, and is particularly adapted to cooperate with an inclined track of the gravity feed type.

This particular device forms part of an apparatus for cooking or cooling the foodstuff to be canned, wherein said cans containing the foodstuff are caused to travel in a continuous manner, preferably from the bottom of the machine upwardly to the top thereof, and during their course of travel carried backward and forward through the apparatus, and successively elevated from one plane to another by specially designed conveyor mechanism, all of which is covered in a co-pending application filed March 28th, 1921, Serial No. 456,147.

It has been demonstrated that the most convenient manner of feeding the cans to this type of apparatus is by gravity, causing them to roll down an inclined track or chute on to the continuously operated conveyor mechanism employed for conducting the cans through the various types of apparatus aforesaid.

One of the chief disadvantages, however, of this type of feeding mechanism is that the cans, owing to their increased velocity as they reach the bottom of the chute, have a tendency to ride over one another or become jammed upon entering the conveyor mechanism, oftentimes clogging the main apparatus and necessitating the stopping thereof and resulting in the denting or injuring of the cans. By reason of these various difficulties, undesirable delays are incurred and it is necessary to require the constant attention of the workmen in order to prevent, as far as possible, the frequent occurrence of these heretofore unavoidable mishaps.

The particular object of this invention is to overcome these various difficulties in producing a device wherein its chief merit lies in its positive and automatic action, whereby the motion of the rolling cans is arrested just prior to their entering the conveyor, the cans being fed into the conveyor mechanism without jumping or other interference and without requiring any attention from the workmen or attendants.

Another object of the invention is the provision of a device of this character possessing all of the important advantages before mentioned, yet, at the same time, being simple in operation and construction, and one that can be conveniently adapted and attached to the conventional type of gravity or inclined track apparatus.

A still further and important object is that by reason of its simplicity of operation and construction, the liability of its becoming disarranged or otherwise impaired in its operation is reduced to a minimum and is practically nil.

Generally speaking the device comprises a pair of parallel arms connected at one end to form a substantially U-shaped frame embracing an inclined track or the like having the free ends of the frame pivotally secured at points below the elevated portion of the track and its closed end properly disposed above the depressed ends of the elevated track, being normally supported in this position by a downwardly extending plate or stop which is adapted to engage the upwardly extending flanges of the track-way, so that the cans as they roll down the inclined track-way strike the depending portion of the closed end of the U-shaped frame and are checked against further movement in this direction. The supporting rails of the inclined track-way are foreshortened or cut away sufficient to allow a can to drop downwardly off the ends thereof after striking the depending portion or check member carried by the U-shaped frame.

The inclined track carrying the automatic gate is positioned directly above the lower horizontal track of the apparatus carrying the conveyor, with which the gate

and feeding apparatus is adapted to cooperate, so that as the cans drop successively from between the foreshortened ends of the inclined track and gate they will be uniformly fed in their proper places on the track-way of the main apparatus and be picked up by the conveyor mechanism, thereby preventing any congestion or improper feeding of the cans at this point.

It will be noted that the lower end of the check plate member, in its normal position may in some instances be in a plane below the highest point of the cans conveyed along the horizontal track-way of the main apparatus, but owing to the hinged construction of the gate and the curvature of the cans, said cans will cause the lifting of the gate at the proper time as they come in contact with the check plate member as the cans are picked up and pushed along the horizontal track prior to their entrance into the main apparatus, this elevating of the check plate member and gate under these conditions, however, not interfering in any way with the efficient normal operation of the gate.

In the accompanying drawings,

Fig. 1 illustrates a plan view of the device,

Fig. 2 is a side elevation thereof, and

Fig. 3 is a modification of the closed end construction of the gate.

Referring to the drawings in detail, the invention comprises an elongated substantially U-shaped frame member 1, having a pair of parallel members or arms 2, pivotally secured at their open ends 3 to a member 4 forming one of the supports of an inclined track 5, said track 5 being disposed or mounted above the horizontal track-way 6, carried upon suitable supports 7, conveniently secured to the longitudinal sills or the like 8 forming the base of the main apparatus, not shown, and in connection with which the invention is adapted to be used. The closed end 9 of the U-shaped frame 1 is preferably constructed by a continuation of the arms 2, forming a one-piece structure. This U-shaped frame 1 is preferably disposed in horizontal position, embracing the inclined track-way 5, the pivoted ends of said frame being located below the elevated portion of the inclined track 5, and the closed end thereof above the depressed end of said inclined track. Depending from the closed end 9 of the frame 1 is a check plate or stop 10, the lower end of said check plate 10 adapted to engage and rest on the vertical side flanges 11 of the inclined track 5, the stop or check plate 10 maintaining frame 1 in its normal position. The check plate 10 also projects upwardly above frame 1, and at this point is bent as at 12 to form a guard or hood to prevent the cans from jumping over the U-shaped frame 1 when they strike the stop or check plate 10, as they are interrupted during their travel down the inclined track-way 5.

The inclined track 5, similar to the horizontal track 6, is preferably of L-shape, in cross-section, providing supporting rails 13 for the cans rolling along the track 5 and vertically disposed side flanges 11 for the purpose of confining and guiding said cans in their course of travel along said track. The said flanges 11 of the track 5 are continued downwardly towards the horizontal track-way 6 below to act as guides, preventing the lateral motion of the cans as they drop from the inclined track-way 5 on to the horizontal track-way 6. The can-supporting track rails 13 of the inclined track 5 are foreshortened at their lower ends 14, providing a space or opening between said lower ends 14 and the stop or check plate 10, to allow the cans to successively drop through said opening on to the horizontal track 6, where they are picked up by suitable conveying elements 15, carried by a chain conveyor of peculiar construction, not shown, which conveyor forms the subject of a co-pending application.

It is to be understood that in the present construction and operation of the device, the same is to be used in connection with a double arrangement of horizontal and inclined tracks, requiring merely a duplication of the improved device. As shown in the drawings, only one device and a single horizontal and inclined track is shown, which has been done merely for the purpose of convenience in illustration. When these gates are arranged in pairs and adapted to cooperate with a double track-way arrangement, a conveyor chain is mounted to travel between the doubly arranged tracks, said chain being provided with laterally projecting conveyor elements 15 extending over the respective track-ways. To permit the passing of these conveyor elements 15 under the lower ends of the inclined track-way 5, the inside flange 11 of each inclined track-way is foreshortened, as clearly shown in Fig. 1.

Fig. 3 shows a modification of the closed end of the gate, wherein a separate end piece 9′ is used in place of the one-piece construction as shown in Figs. 1 and 2. The various other points of the device are identical with those shown in the figures aforesaid, the stop or check plate 10 being secured to the intermediate member 9′ in a manner similar to the securing thereof to the closed end 9 of the continuously formed U-shaped frame 1.

As hereinbefore stated, when the gate is at rest or in normal position, the lower end of the check plate or stop 10 is supported on the upper edge of the side flange 11 of the inclined track 5. A can rolling down the inclined track 5 engages the check or stop 10 and has its forward motion positively ar-

rested thereby. It is thus prevented from shooting out over the cans on the horizontal track-way 6 below said inclined track and is further prevented from jumping up over the top of the gate by the curved guard or hood 12. If the space below the arrested can is clear, said can will drop down on to the horizontal track-way 6 below, and if said horizontal track-way is not clear at this point the can will be held from further forward motion until the obstruction below has passed.

This gate is especially advantageous for feeding cans into the improved canning apparatus hereinbefore referred to, in which the cans are caused to roll or be conveyed along horizontal tracks by the motion of a chain operated beside said tracks and provided with lateral arms, hereinbefore indicated at 15, which project over the tracks, engage the cans, and push the same in their proper course along said tracks. When the improved gate construction, hereinbefore described, is used to feed the cans on to the horizontal tracks, in conjunction with the above mentioned chain mechanism, the regularly spaced arms 15 thereof are continually passing beneath the stop or check plate 10, and the fact that the gate is hinged at its upper end allows the lower end with the stop or check plate to rise and fall as the cans conducted along said horizontal track pass beneath said check plate or stop 10. Also if the falling can should strike one of the chain projections 15, as said can reaches the dropping off place as the arm 15 of the chain is passing thereunder, said can will be merely caused to rise slightly until said projection has passed, after which the can will fall into its proper place on the horizontal track-way, to be picked up by the next succeeding chain projection 15.

The above described function of the gate 1, and its peculiar cooperation with the cans rolling down the inclined track-way 5, and the manner of feeding said cans successively to the track-way below entering the cooker or cooler, to be properly picked up by the continuously moving conveyor without interfering in any way or stopping the conveyor, are highly important features of this very ingenious arrangement, especially well adapted to the general operation of apparatus with which it is associated. The herein described positive arrest of the forward motion of the rolling cans, combined with this equally important feature of lifting, permitting these cans, which are caught in the air by the chain, to pass, materially adds to the adaptability and efficiency of the device, and is the real novelty of the invention and a valuable contribution to the art.

It is important that the hinged member of the gate be so constructed that the stop or check plate 10 shall be at such an angle to the line of motion of the cans on the inclined track that their forward motion will be positively arrested without lifting the gate. This will be accomplished if the stop 10 in its normal position is perpendicularly disposed to the direction of motion of the approaching cans, although it has been found that it is not absolutely necessary to have the angle exactly 90°, as gates with the stop arranged at a somewhat lesser angle operate satisfactorily, even at an angle of 75°.

What we claim is:

1. In an automatic gate or feed-regulating device for cans, the combination with an inclined track, of means disposed across said track adapted to arrest the forward rolling motion of the cans thereon, and movable means permitting the subsequent vertical dropping of said cans from said inclined track.

2. In an automatic gate or feed-regulating device for cans, the combination with an inclined track of a vertically movable member disposed across said track adapted to temporarily arrest the forward rolling motion of each can thereon, and means permitting the subsequent vertical dropping of each can from said inclined track.

3. In an automatic gate or feed-regulating device for cans, the combination with an inclined track, of a movable member, a pivotal connection between one end of said movable member and the inclined track, a portion carried by the other end of said member extending across said track adapted to arrest the forward rolling motion of the cans thereon, and means permitting the subsequent vertical dropping of said cans successively from said inclined track.

4. In an automatic gate or feed-regulating device for cans, the combination with an inclined track, of a movable member embracing said inclined track, a pivotal connection between one end of said member and the elevated portion of said inclined track, a stop carried by the other end of said member extending across the depressed portion of said inclined track adapted to arrest the forward rolling motion of each can thereon, and means permitting the subsequent vertical dropping of each can from said inclined track.

5. In an automatic gate or feed-regulating device for cans, the combination with an inclined track, of a movable member embracing said inclined track, a pivotal connection between one end of said member and the elevated portion of said inclined track, a check plate or stop carried by the other end of said member extending across the depressed portion of the inclined track adapted to arrest the forward rolling motion of each can thereon, said inclined track comprising can-supporting rails and vertically disposed flanges, the can-supporting rails being cut

away or foreshortened adjacent the check plate or stop, providing a clearance permitting the vertical dropping of each can after being arrested by the check plate or stop.

6. In an automatic gate or feed-regulating device for cans, the combination with an inclined track, of a substantially U-shaped member embracing said inclined track, pivotal connections between the ends of the legs of said U-shaped member and the elevated portion of said inclined track, a check plate or stop carried by the closed end of said U-shaped member extending across said inclined track, said check plate or stop comprising a straight lower portion and a curved upper portion adapted to arrest the forward motion of each can rolling down the inclined track, said inclined track comprising can-supporting rails and vertically disposed flanges, the can-supporting rails being cut away or foreshortened adjacent the check plate or stop, providing a clearance therebetween, permitting the subsequent vertical dropping of each can after being arrested by the check plate or stop.

7. In an automatic gate or feed-regulating device for cans, the combination with an inclined track and a substantially horizontal track-way, of a vertically movable member positioned across said inclined track for positively arresting the motion of said cans rolling down said inclined track, and means permitting the subsequent vertical dropping of said cans successively from the inclined track on to the horizontal trackway.

8. In an automatic gate or feed-regulating device for cans, the combination with an inclined track, of a substantially U-shaped member embracing said inclined track, the ends of the legs of said U-shaped member being pivotally secured at points below the elevated portion of the track, a check plate or stop carried by the closed end of said U-shaped member, extending across and disposed above the depressed end of the inclined track, said check plate or stop comprising a straight lower portion and a curved upper portion adapted to arrest the forward motion of each can rolling down the inclined track, said inclined track comprising can-supporting rails and vertically disposed flanges, the can-supporting rails being cut away or foreshortened adjacent the check plate or stop, providing a clearance therebetween, permitting the subsequent vertical dropping of each can after being arrested by the check plate or stop.

In testimony whereof we affix our signatures.

SIMES T. HOYT.
JOHN S. NAPIER.