A. R. THOMPSON.

EXHAUST BOX FOR CANS.

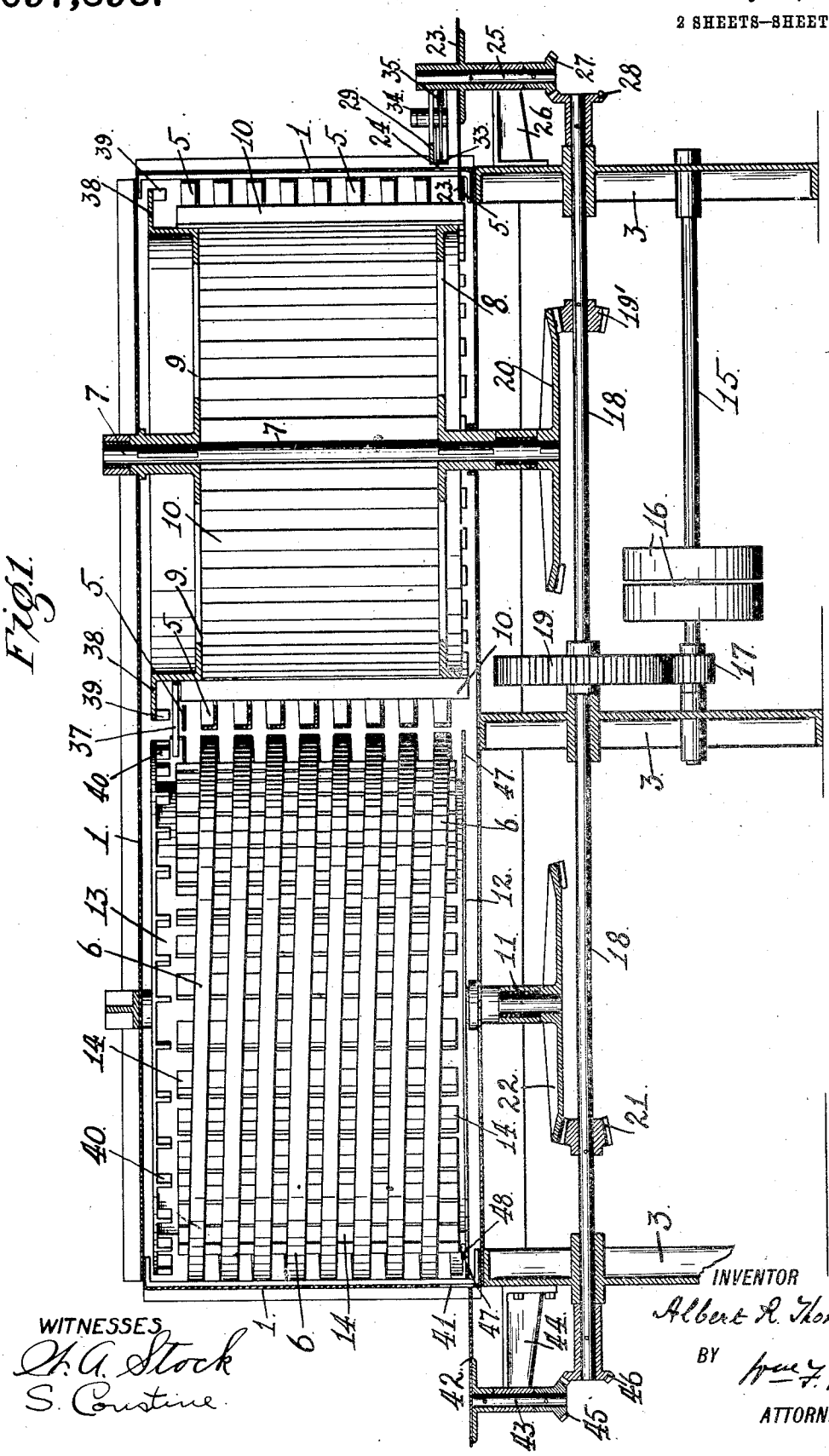
APPLICATION FILED NOV. 17, 1913.

1,097,893.

Patented May 26, 1914.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

H. G. Stock

S. Coustine

INVENTOR

Albert R. Thompson

BY

Wm. F. Booth

ATTORNEY

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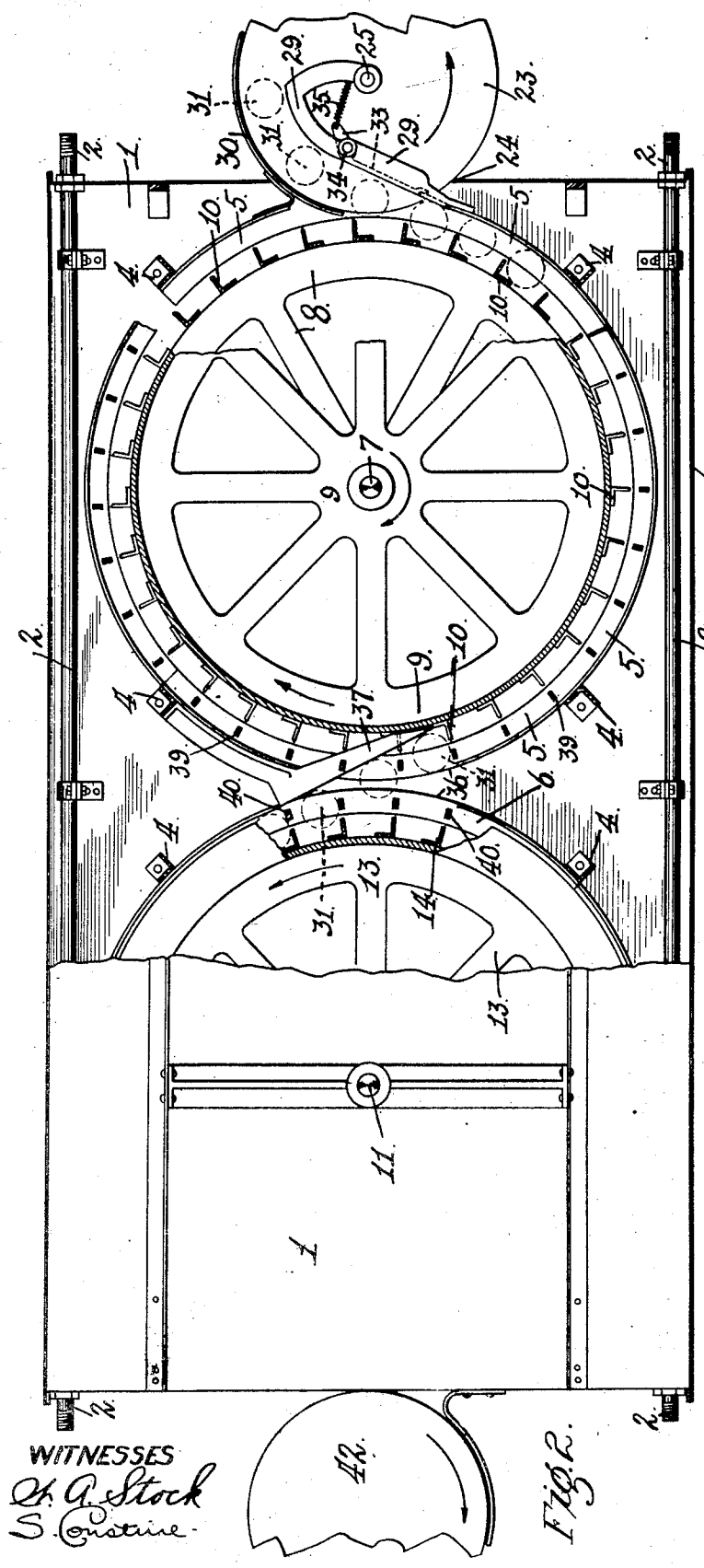


Fig. 2.

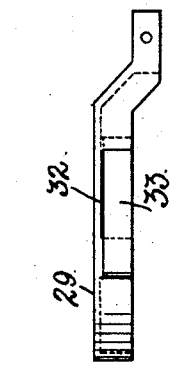


Fig. 5.

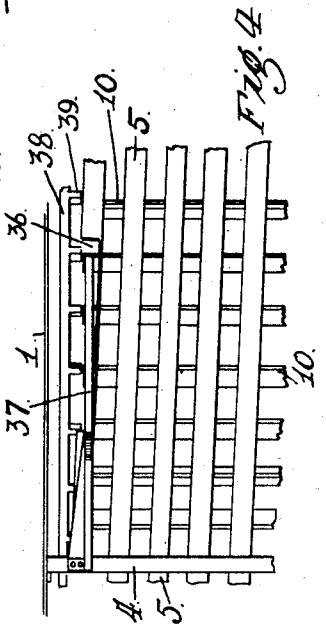


Fig. 4

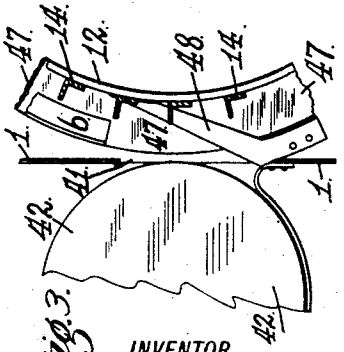


Fig. 3.

WITNESSES

H. A. Stock

S. Cristine

INVENTOR

Albert R. Thompson

BY

Wm. F. Booth

ATTORNEY

UNITED STATES PATENT OFFICE.

ALBERT R. THOMPSON, OF SAN JOSE, CALIFORNIA, ASSIGNOR TO ANDERSON-BARNGROVER MFG. CO., OF SAN JOSE, CALIFORNIA, A CORPORATION OF CALIFORNIA.

EXHAUST-BOX FOR CANS.

1,097,893. Specification of Letters Patent. Patented May 26, 1914.

Application filed November 17, 1913. Serial No. 801,490.

To all whom it may concern:

Be it known that I, ALBERT R. THOMPSON, a citizen of the United States, residing at San Jose, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Exhaust-Boxes for Cans, of which the following is a specification.

My invention relates to the class of apparatus used in the canning art for subjecting the filled, but still uncapped cans, to what is termed the "first cook," by which the air is exhausted, from which circumstance such machines have derived their common title of "exhaust boxes."

The object of my invention is to provide a simple and compact machine of this class, in which the cans will be conducted uninterruptedly and evenly without danger of spilling their contents, through an extensive and effective heating course, and to this end my invention consists in the novel exhaust box which I shall hereinafter fully describe by reference to the accompanying drawings, in which—

Figure 1 is a general vertical longitudinal section through the box, the interior parts being shown partly in elevation and partly in section. Fig. 2 is a broken sectional plan view of the machine. Fig. 3 is a sectional plan view, in detail, of the discharging device. Fig. 4 is an elevational detail of the transferring means for the cans during their course through the box. Fig. 5 is an elevational detail of one of the guides for the feed of the cans to the box.

1 is the outside case, shell or box, to which heat is supplied in any usual manner, as, for example, by the steam pipes 2, shown in Fig. 2.

3 are the legs supporting the box. Within the box rise standards 4. There are eight of these, divided, as shown in Fig. 2, into two groups of four each in circular series. To one of these circular series of standards is fixed a vertically disposed helically directed track 5 which is best in the form of an angle iron, as seen clearly in Fig. 1. To the other circular series of standards is fixed a similar helical track 6. Rising in the axis of the helical track 5 and suitably mounted in the box, is a shaft 7 which carries a lower spider 8 and an upper spider 9. To and between the peripheries of these spiders are secured the vertical spaced pusher bars 10 which, as shown in Fig. 2, are, in their best form, of angle section. In similar manner another shaft 11 rises in the axis of the helical track 6, said shaft carrying a lower spider 12 and an upper spider 13, between which are secured the vertical spaced pusher bars 14. The two series of pusher bars 10 and 14 rotate in opposite directions, as shown by the arrows in Fig. 2, their rotation being effected by means of the power connections, shown in Fig. 1. These connections are the main shaft 15 with fast and loose pulleys 16 and pinion 17, the counter shaft 18 with gear 19 meshing with the pinion 17, the pinion 19′ on the counter shaft meshing with a gear 20 on the vertical shaft 7, and the pinion 21 on the counter shaft meshing with a gear 22 on the vertical shaft 11.

From the foregoing description, it will be seen that if a can be introduced to the bottom of the helical track 5, it will be there engaged by one of the pusher-bars 10 and will then, by the revolution of said bar, be carried upon said track about the shaft axis 7, and be forced up through a helical course to the top of said track. Then if this can be transferred to the top of the other helical track 6, it will, by one of the pusher bars 14, be carried down on said track through a helical course to the bottom of said track, at which point it may be delivered. Thus an extensive and well-conceived course is provided for the can, during which it will be subjected to the usual "first-cook" or exhaust common in this art. In order to carry out this operation, the essential features are the means for introducing the can to its course, the means for transferring it at the summit of said course, and the means for delivering it from the end of its course. Taking these up in the order stated, the feeding means are as follows:—23 is the feed disk, projecting into an inlet opening 24 in the end of the box 1, and overlying at its projecting portion the lowermost coil or commencement of the helical track 5, as is best seen in Fig. 1. This disk 23 is carried and rotated by a shaft 25 mounted in

a bracket 26 projecting from the box 1, and said shaft is rotated by a bevel pinion 27 on its lower end, which meshes with a bevel pinion 28 on the countershaft 18.

29 is a fixed guide arm, secured at its inner end to the lowest coil of the track 5. The arm projects outwardly through the opening 24 in the box and lies above the feed disk 23, being so directed thereover, as seen in Fig. 2, as to form, in conjunction with a guide flange 30, also secured to the box 1, and projecting through its opening, a passageway on the outer surface of the disk, through which said disk in rotating is adapted to carry the cans 31 indicated by the dotted circles. The outer end of the guide-arm 29 is bent to the center and finds support about the axis of the disk. The guide arm 29 where it passes through the opening 24 in the box end is cut out or arched to leave an opening 32, as seen in Fig. 5, and in this opening plays a yielding wall 33 which is pivoted to the arm at 34, and is affected by a spring 35 to remain pressed forward to normally close the arm opening 32. The rotation of the feed disk 23 is in the direction indicated by the arrow in Fig. 2. Now, it will be seen, that as the entrance passageway between the guide arm 29 and the guide flange 30 leads into the track 5 at an intersecting angle, in order to deposit the cans thereon, there must occur a point at which and a time when the outer edges of the revolving vertical pusher-bars 10 which must engage the cans, will so narrow said passageway as to tend to crush the cans if cought between the bars and the arm 29. To lessen this tendency I have found it desirable to rotate the feed disk 23 at a greater peripheral speed than the speed of revolution of the pusher bars, and this difference of rotation is plainly indicated by the transmitting gears and pinions shown in Fig. 1. The effect of this is to so hurry the procession of cans, that even though they sildingly crowd back in the line, the foremost can will always be ready to leap in quickly, as it were, behind a passing pusher bar, and in front of the succeeding bar, before the latter, moving relatively slowly, can have a chance to catch it on the side and crush it. In addition to this precaution and in order to relieve any possible crushing tendency, I provide the yielding wall 33 against which the cans bear at this critical point, so that if pressure occurs, the wall will move outward and relieve such pressure, thus allowing the pusher bar to proceed, and the can to pass in behind it.

The transfer means for the cans, at the summit of their course are as follows:—Where the two helical tracks 5 and 6 approach each other at their uppermost courses, their outer walls are cut out as shown at 36, in Fig. 2, so that said tracks are open for the passage of the cans from one to the other. 37 is a fixed switch rail, the heel of which lies at the far extremity of the cut out wall of the track 6, and its point lies in close against the periphery of the upper spider 9 of the first series of pusher bars 10, the upper ends of said bars being so shortened as to pass under said switch rail. Thus the switch-rail bridges the space between the two helical tracks, and its point lies close enough in to get behind the cans to start them outward on the transfer movement. Now as the pusher bars must pass under the switch rail, it follows that they are too short at their tops to engage the cans and push them along at the summit of the course. To provide for this, it will be seen by reference to Fig. 1, that the upper spider 9 is flanged or arched over the upper course of the helical track 5 and over the switch rail, as shown, at 38, and said flange is provided with down-turned pusher studs 39 adapted to engage the can sides from above, and thereby continue the advance of the cans after the pusher bars have, on account of stopping short, ceased to affect said cans. Thus the cans are advanced by the pusher studs 39 to the switch rail 37 by which as shown by the dotted lines, said cans are diverted outwardly from the track 5 over to the track 6. Here they encounter similar overhead pusher-studs 40 on the upper spider 13 of the shaft 11, and by these studs they are pushed along the track 6 far enough in on said track to be picked up by the pusher bars 14 which carry them on their downward helical course on said track 6.

The delivery means are as follows:—As seen in Figs. 1 and 3, the end of the box 1 is provided with an opening 41, outside of which is the discharge table 42 which is here shown as a disk. This table may be, though not necessarily, a rotating one, motion being imparted to it by a shaft 43 mounted in a bracket 44 extending from the box 1. A bevel pinion 45 on the lower end of the shaft meshes with a bevel pinion 46 on the countershaft 18. The lower spider 12 of the shaft 11 has an outwardly projecting can-supporting flange 47 which lies just within the exit opening 41 of the box, as seen clearly in Fig. 3. The discharge end of the helical track 6 leads down to this flange 47, so that the cans, advanced by the pusher-bars 14 are carried from the terminal of the track 6 onto the flange. At this place is a fixed switch rail 48, the point of which is directed far enough inward to get behind the cans. Then as the cans are carried by the rotating flange 47, they are directed outwardly, while still on said flange, by the switch rail 48 to and upon the discharge table 42, and thus by the joint action of the flange 47 and the rail 48 they

are carried out of the box and delivered upon the table at a point outside said box, and said table rotating, as shown by the arrow in Fig. 2, carries them to their destination.

I claim:—

1. An exhaust box for cans comprising a heating box; a fixed vertically disposed helical track within the box; means for feeding the cans to the lower end of said track; a rotating series of pusher bars engaging the cans on the track and adapted to effect their upward travel through a helical course on said track to the top thereof; a second fixed vertically disposed helical track within the box arranged beside and having a different axis from the first track; a second rotating series of pusher bars engaging the cans on the second track and adapted to effect their downward travel through a helical course on said second track from the top to the bottom thereof; means for transferring the cans from the top of the first helical track to the top of the second helical track; and means for delivering the cans from the bottom of the second track.

2. In an exhaust box for cans, and in combination with a heating box, a pair of fixed vertically disposed helical tracks arranged side by side within said box and having different axes; separate rotating series of pusher bars one series for each helical track and arranged concentrically therewith; means for rotating one series of pusher bars in a direction to advance the cans on its coacting track through a helical course from bottom to top; means for rotating the other series of pusher bars in a direction to advance the cans on its coacting track through a helical course from top to bottom, and a fixed switch rail extending between the tops of the two tracks to direct the cans from the top of one track to the top of the other track.

3. In an exhaust box for cans, and in combination with a heating box, a pair of fixed vertically disposed helical tracks arranged side by side within said box and having different axes; separate rotating series of pusher bars one series for each helical track and arranged concentrically therewith; means for rotating one series of pusher bars in a direction to advance the cans on its coacting track through a helical course from bottom to top; means for rotating the other series of pusher bars in a direction to advance the cans on its coacting track through a helical course from top to bottom, a fixed switch rail extending between the tops of the two tracks to direct the cans from the top of one track to the top of the other track, and supplementary rotating pushing devices engaging the cans from above to advance them along said switch-rail.

4. In an exhaust box, and in combination with a heating box, a pair of fixed vertically disposed helical tracks arranged side by side within the box about different axes; a rotating series of vertical pusher bars within and coacting with said tracks, one series for each track, to advance the cans upwardly on one track and downwardly on the other track; a rotating shaft in the axis of each series of pusher-bars, said shafts each carrying a lower and an upper spider to which the pusher-bars are attached; a fixed switch-rail bridging the space between the upper ends of the two helical tracks to direct the cans from one to the other, said switch rail having its point overlying the upper ends of the pusher bars of the first track and extended to the inside of the cans to divert them outwardly; outwardly projecting flanges carried by each upper spider and overlying the tops of the cans in the switching region; and pusher studs depending from said flanges to engage the cans from above to advance them along the switch-rail from one track to the other.

5. In an exhaust box, and in combination with a heating box having a can entrance opening, a fixed vertically disposed helical track within the box having its lower terminal adjacent the entrance opening of said box; a rotating series of pusher-bars coacting with said track to advance the cans thereon; a rotating feed disk projecting into the box through its entrance opening and arranged with relation to the lower terminal of the track to deliver the cans thereto in the rotary path of the pusher bars; fixed guides overlying the feed disk and extending into the entrance opening of the box, said guides being so disposed as to form a can passage at an intersecting angle to the track and the rotary path of the pusher bars; and means for rotating the feed disk at a greater peripheral speed than the speed of rotation of the pusher-bar series.

6. In an exhaust box, and in combination with a heating box having a can entrance opening, a fixed vertically disposed helical track within the box having its lower terminal adjacent the entrance opening of said box; a rotating series of pusher-bars coacting with said track to advance the cans thereon; a rotating feed disk projecting into the box through its entrance opening and arranged with relation to the lower terminal of the track to deliver the cans thereto in the rotary path of the pusher bars; fixed guides overlying the feed disk and extending into the entrance opening of the box, said guides being so disposed as to form a can passage at an intersecting angle to the track and the rotary path of the pusher-bars; and one of said guides having a yielding wall in its region of approach to said path.

7. In an exhaust box, and in combination

with a heating box having a can entrance opening, a fixed vertically disposed helical track within the box having its lower terminal adjacent the entrance opening of said box; a rotating series of pusher-bars coacting with said track to advance the cans thereon; a rotating feed disk projecting into the box through its entrance opening and arranged with relation to the lower terminal of the track to deliver the cans thereto in the rotary path of the pusher bars; fixed guides overlying the feed disk and extending into the entrance opening of the box, said guides being so disposed as to form a can passage at an intersecting angle to the track and the rotary path of the pusher-bars, and one of said guides having a yielding wall in its region of approach to said path; and means for rotating the feed disk at a greater peripheral speed than the speed of rotation of the pusher-bar series.

8. In an exhaust box, and in combination with a heating box having a can exit opening, a fixed vertically disposed helical track within the box having its lower terminal adjacent the exit opening of said box; a rotating shaft in the axis of said track, said shaft carrying an upper and a lower spider; an outwardly extending flange carried by the lower spider and adapted to receive the cans from the lower terminal of the track; a series of pusher bars carried by said spiders and adapted to advance the cans on said track to its lower terminal and on to the flange of the lower spider; a discharge table outside the exit opening of the box; and a fixed switch rail entering the exit opening of the box above the flange of the lower spider to direct the cans from the flange of the lower spider outward through the exit opening and on to the discharge table.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALBERT R. THOMPSON.

Witnesses:
WM. F. BOOTH,
D. B. RICHARDS.