May 1, 1928.

1,667,962

L. TITUS

CAN CASING MACHINE

Filed June 4, 1925

4 Sheets-Sheet 1

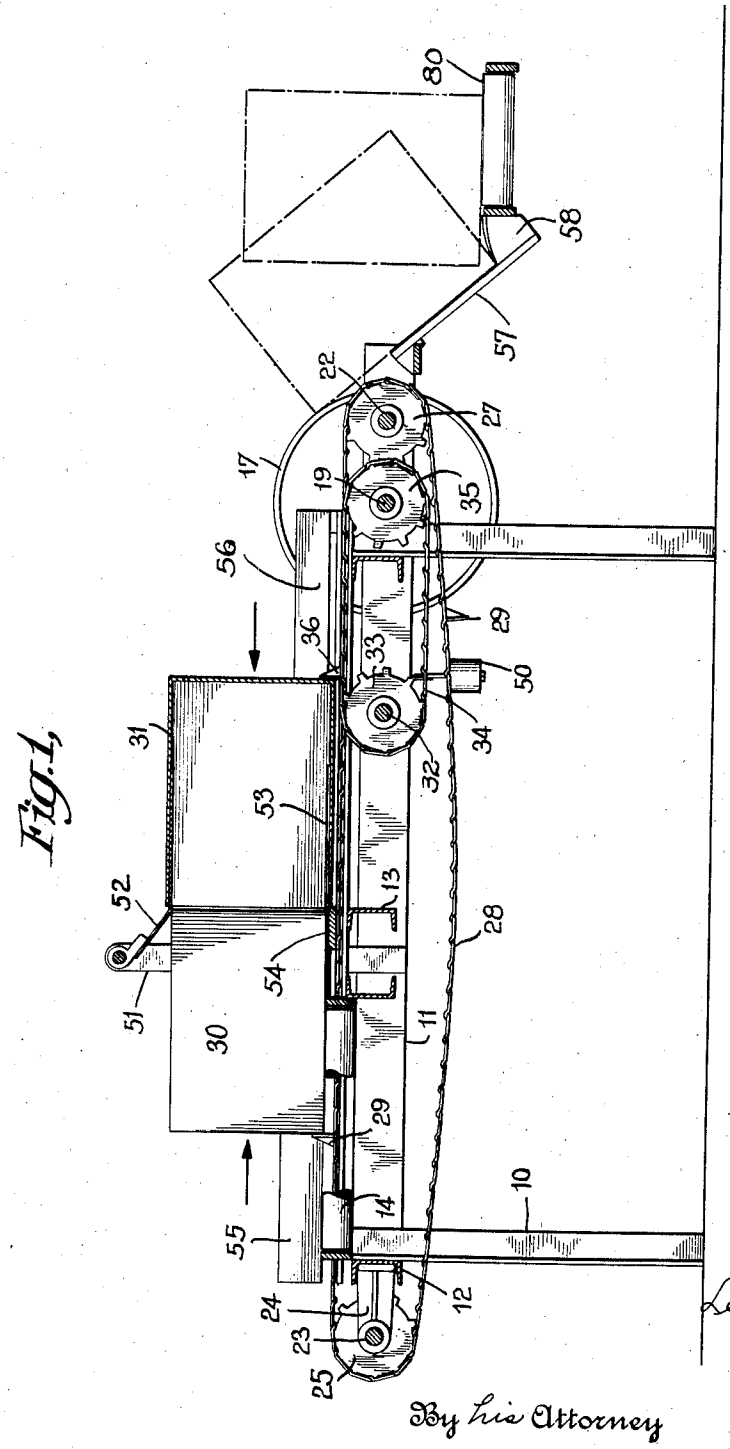


Fig. 1.

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By his Attorney

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May 1, 1928.

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4 Sheets-Sheet 2

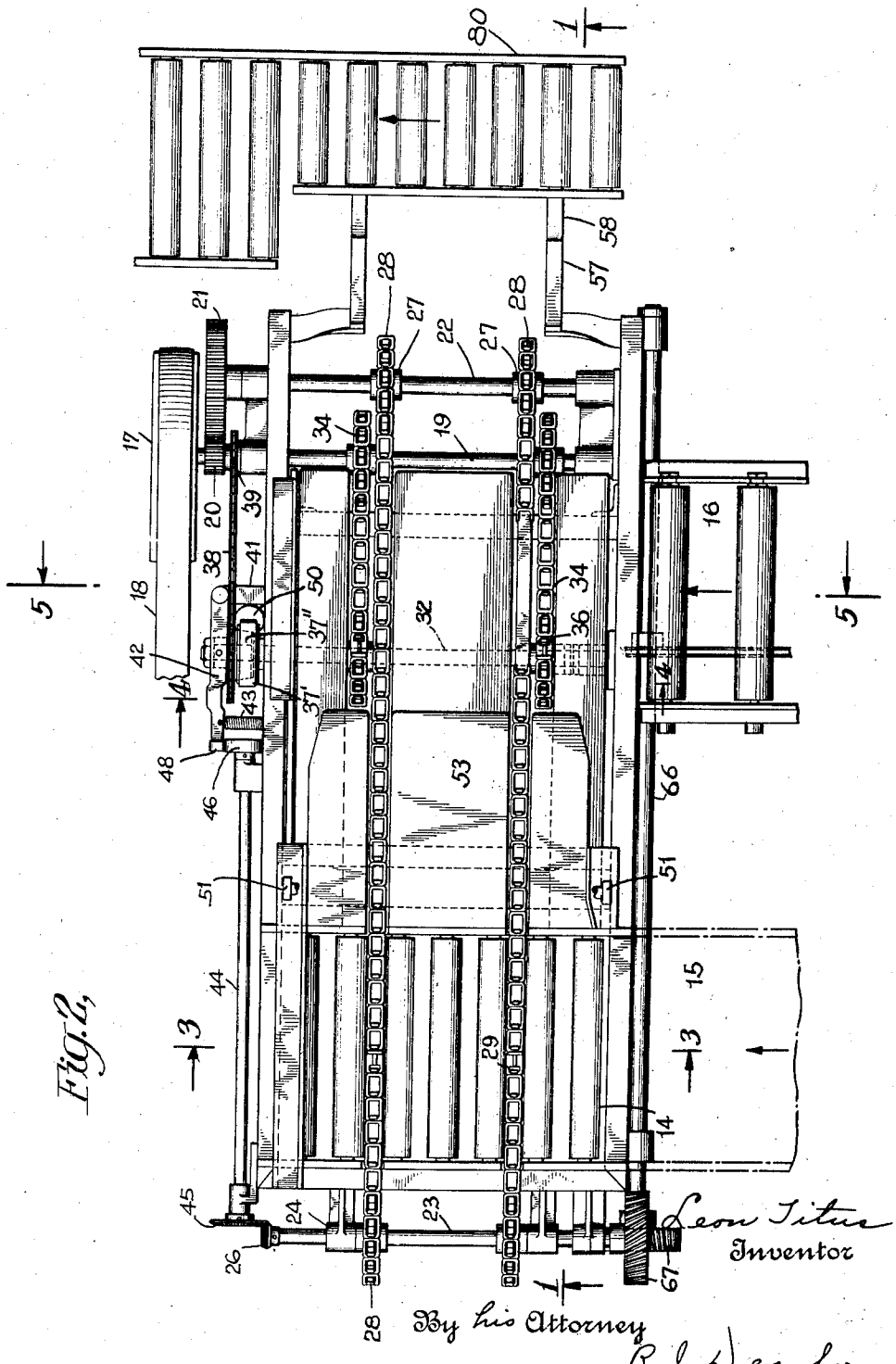


Fig. 2.

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CAN CASING MACHINE

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Fig. 4.

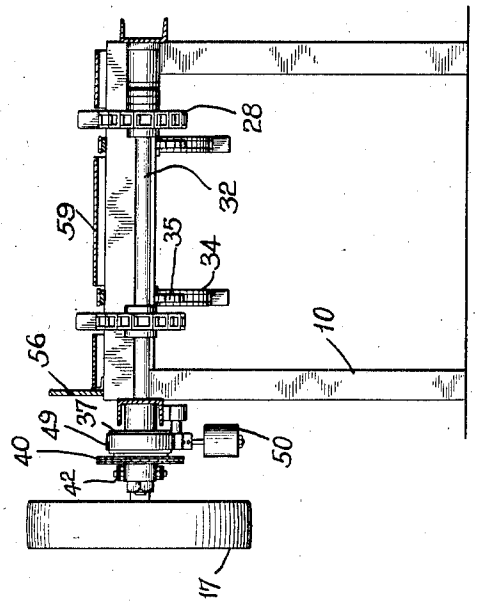
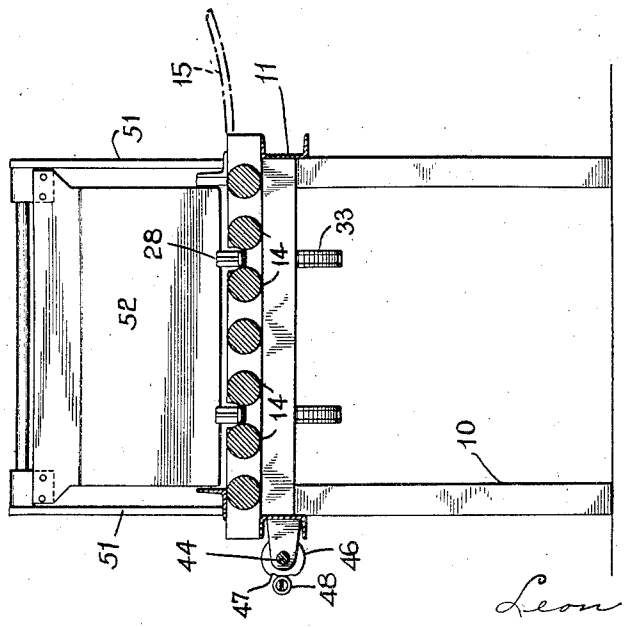


Fig. 3.



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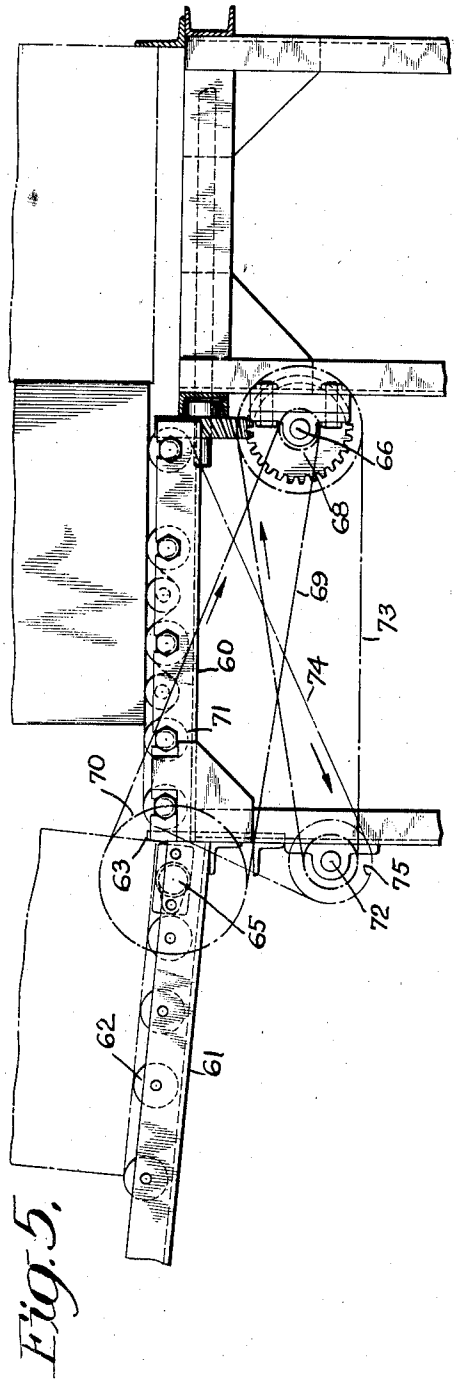


Fig. 5.

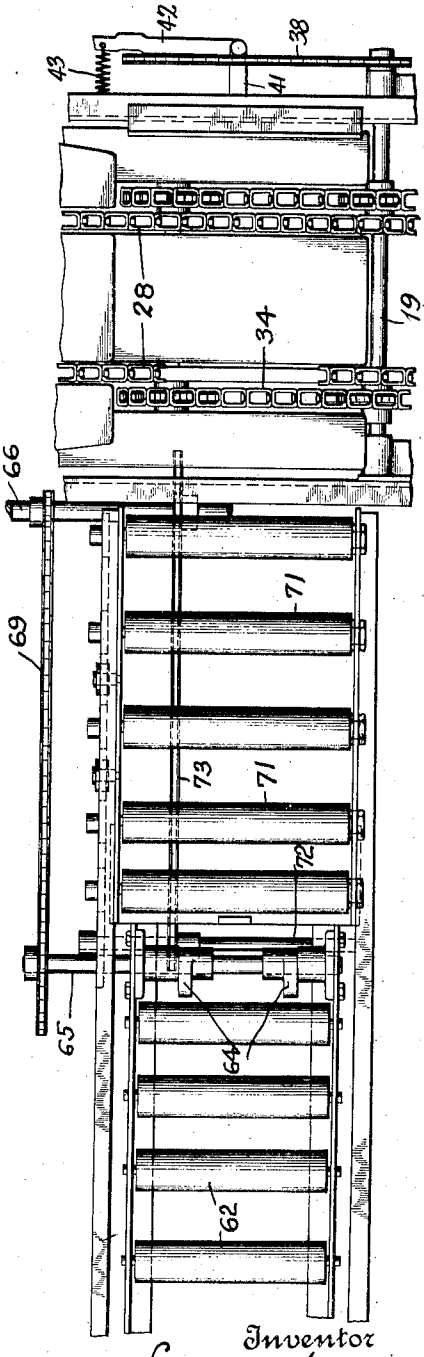


Fig. 6.

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Leon Titus

By his Attorney
R. J. Dearborn

Patented May 1, 1928. 1,667,962

UNITED STATES PATENT OFFICE.

LEON TITUS, OF PORT ARTHUR, TEXAS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE TEXAS COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

CAN-CASING MACHINE.

Application filed June 4, 1925. Serial No. 34,819.

This invention relates to can casing machines and has special reference to machines for automatically casing square or angular cans.

One of the objects of the invention is to provide a machine for automatically casing square or rectangular shaped cans such, for example, as oil cans in suitable shipping containers such as wooden boxes or the like.

Another object of the invention is to provide apparatus for feeding a supply of filled cans and a supply of shipping containers or cases to the can casing machine, and for selectively inserting one or more of the cans in one of the cases.

Still another object of the invention is to provide a machine for automatically moving together a can or cans and a container in which the cans are to be packed, and for subsequently carrying off the filled container.

A further object of the invention is to provide a can casing machine wherein the cans and cases are suitably guided so that the cans are certain to fit squarely within the container.

A still further object of the invention is to provide mechanical means for handling the cans and containers, and timing means for controlling the operation of said mechanical means.

Still another object of the invention is to provide an apparatus for feeding the cases to the can casing machine at predetermined and spaced intervals.

Other objects, features, and advantages of the invention will appear from the following description taken in connection with the accompanying drawings, in which—

Fig. 1 is a view in sectional elevation, taken on the line 1—1 of Fig. 2, of a can casing machine constructed in accordance with the present invention and constituting an embodiment thereof.

Fig. 2 is a plan view of the same machine illustrated in Fig. 1.

Fig. 3 is a view in cross sectional elevation taken on the line 3—3 of Fig. 2.

Fig. 4 is a similar view taken on the line 4—4 of Fig. 2.

Fig. 5 is a view in elevation of the case feeding mechanism and a sectional view of the main body of the machine taken on the line 5—5 of Fig. 2.

Fig. 6 is a plan view of the apparatus shown in Fig. 5.

Referring to the drawings, the machine comprises a supporting frame-work having a number of supporting legs 10 connected at their upper ends by suitable side beams 11 and end beams 12, and suitable cross beams, such as 13, are provided for purposes which will more readily appear as the description proceeds.

A number of rollers 14 are rotatably mounted at one end of the frame-work and a gravity chute 15 is positioned at one side of the machine so as to feed cans to the rollers 14. Case feeding mechanism indicated generally at 16 is secured to the side of the machine and is constructed and arranged so that its operation synchronizes with that of the machine.

Power for operating the machine is supplied to a pulley 17 from a suitable source (not shown) by means of a belt 18. The pulley 17 is mounted upon a shaft 19 which is suitably journaled in bearings in the supporting structure. The shaft 19 has a gear 20 which meshes with a gear 21 on a second shaft 22 which is parallel to shaft 19 and which is likewise journaled in suitable bearings in the supporting frame-work.

Another rotatable shaft 23 is mounted at the opposite end of the supporting frame-work and is journaled in suitable bearings 24 which are secured to one of the end beams 12. The shaft 23 carries a pair of spaced sprocket wheels 25 and one end of the shaft which extends beyond one of the bearing members is provided with a gear wheel 26.

The shaft 22 likewise carries a pair of spaced sprocket wheels 27. The power transmitted to shaft 22 from shaft 19 is in turn transferred to shaft 23 by means of a pair of spaced sprocket chains or travelling conveyors 28 carried by the sprocket wheels 25 and 27, the chains travelling from left to right as viewed in Fig. 2 and passing between certain of the rollers 14. The chains 28 are each provided with a pair of spaced lugs 29.

Thus far I have described principally the mechanism for feeding to the machine the cans which are to be cased. Briefly, power is applied to the pulley 17 and the shafts 19, 22 and 23 are rotated thus moving the sprocket chains, together with the lugs 29 carried thereby, in the manner just described. The cans, such as 30, are fed by the gravity chute

15 to the rollers 14 and while in position on the rollers, the upper surfaces of which are slightly above the upper faces of the sprocket chains, are engaged by the lugs 29 and carried along thereby and off the rollers.

At substantially the same time a case or container is fed to the machine by the feeding mechanism. This mechanism consists of a table 60 immediately adjacent the machine and adapted to support one case and an inclined gravity chute or conveyor 61. The conveyor 61 may be of any suitable type but as illustrated is simply slightly inclined and provided with rollers 62. A stop 63 is arranged to hold the cases on the conveyor 61 while a cam or preferably a pair of cams 64 mounted on a shaft 65 are provided to raise the cases over the stop 63 at a predetermined point in the cycle of operation of the machine. In synchronizing the operation of the case feeding mechanism 16 with that of the machine the shaft 23 is extended and operatively connected to the shaft 65. The shaft 23 is geared to a shaft 66 by means of spiral gears 67, the shaft 66 carrying a sprocket 68 which is connected by a chain 69 to a sprocket 70 on the shaft 65. The shaft 65 is arranged to make one revolution per cycle of the machine, the cams 64 thus coming into play once in each cycle and operating to raise a case over the stop 63 and to deliver the case to the table or conveyor 60.

The table 60 is preferably provided with power driven rollers 71 which operate to move the case received from the conveyor 61 to the machine. The rollers 71 which are mounted on the table 60 may be operated by means of a shaft 72 which is operatively connected to the shaft 66 by a chain 73 which runs on sprockets on these shafts and the rollers 71 are operated by a belt 74 carried by a wheel 75 on the shaft 72.

The case feeding mechanism herein described is particularly well adapted for use in connection with a can casing machine, but it should be clearly understood that it can be used to equally good advantage for feeding boxes, to nailing machines, for loading machines, and the like and wherever it is desired to feed objects to an apparatus or mechanism at spaced intervals.

For the purpose of picking up the case, such as 31, and carrying it forward to meet the can or cans 30, another rotatable shaft 32 is mounted in suitable bearings in the supporting frame-work. A pair of spaced sprocket wheels 33 are keyed to the shaft 32 and carry sprocket chains or travelling conveyors 34 which chains also ride on a pair of spaced idler sprockets 35 which are loosely mounted on the shaft 19. The chains 34 each carry a lug 36.

One end of the shaft 32 extends outward somewhat beyond the side of the supporting frame-work and on the outer end of the shaft is a cone clutch 37 for controlling the transfer of power from the shaft 19 to the shaft 32, the clutch 37 comprising a fixed element 37′ secured on the shaft 32 and an adjustable element 37″ adapted to engage the fixed element by friction when in thrown-in position. A sprocket chain 38 rides on a sprocket wheel 39 which is keyed on the shaft 19 and on a sprocket wheel 40 which runs idle on the shaft 32 but which is rigid with the adjustable element 37″ of the clutch 37 so that power is transferred to shaft 32 only when the clutch is thrown in.

A bracket 41 is secured to one of the side beams 11 of the supporting frame-work and pivoted thereto is a lever 42 which by reason of a spring 43 tends to hold the clutch 37 in the thrown-in position so that power is applied to the shaft 32. The clutch retaining lever 42 is provided with a suitable bearing for engagement with the clutch 37 or, more strictly speaking, with the sprocket wheel 33 which is integral with the clutch.

A rotatable shaft 44 is journaled in suitable bearings secured on the side of the supporting frame-work and one end of the shaft carries a gear wheel 45, the teeth of which mesh with those of the wheel 26 so that the shaft 44 is rotated with the shaft 23. The other end of the shaft 44 carries a cam 46, the cam being substantially circular in cross section but having a depressed portion as illustrated at 47. A roller 48 is mounted on the end of the lever 42 and engages the cam 46, the arrangement being such that when the roller 48 is engaged in the depression 47 of the cam 46 the spring 43 holds the clutch 37 in operative position so that the shaft 32 is rotated by power supplied from the shaft 19. When, however, the roller 48 engages the raised portion of the cam 46 the lever 42 is moved outwardly against the resilience of the spring 43 so that the clutch slips, thereby stopping the rotation of the shaft 32. The shaft 32 may be supplied, if desired, with braking mechanism and in the present instance the braking mechanism takes the form of a belt 49 carrying a weight 50.

From the foregoing it is apparent that the sprocket chains 28 and 34 move in opposite directions so that while the cans 30 are being conveyed by the chains 28 and lugs 29 in one direction the case 31 is simultaneously conveyed in an opposite direction directly towards the on-coming cans. By employing a gear wheel 45 of a suitable size with respect to the gear wheel 26 the relative rates of rotation of the shafts 23 and 44 can be so regulated that the raised portion of the cam 46 will engage the roller 48 on the lever 42 to release the clutch 37 and stop the rotation of the shaft 32 at just the proper time, or as soon as the case 31 has been pushed against stops 54, thereby checking the for-

ward movement of the chains 34 and permitting their direction of movement to be reversed while the chains 28 continue to advance and discharge the filled case from the machine, the chains 34 riding on the idler sprockets 35.

Guiding mechanism is provided to insure that the cans are directed squarely into the cases. The sides of the cases are very likely to be made up of more than one board and in case an edge of one of the boards should project the slightest bit one of the edges of one of the cans might hang up or catch on it and interfere with the successful operation of the machine. In order to prevent any such occurrence an upwardly projecting bracket 51 is secured on each side of the machine. A guide member 52 consisting preferably of a thin sheet of flexible metal is pivotally mounted between the brackets 51. The guide member 52 normally hangs in a vertical position, but is free to be raised to a horizontal position when pushed forward by the advancing cans.

A lower guide member 53 is likewise provided and consists preferably of a relatively thin metal sheet positioned slightly above the top of the machine in such manner that the lower face of the advancing case slips underneath the guide member which itself enters the oncoming case and presents a smooth surface to the cans. Thus two sides of the case are in effect temporarily lined with a metal sheet, and hanging up of the cans on any protruding edges is prevented. The guide 53 has a shoulder portion 54 which constitutes a stop and prevents further forward movement of the case.

Stops 55 and 56 are positioned on the frame-work opposite the chutes 15 and 16, respectively, for the purpose of preventing more than the desired number of cans or cases from entering the machine at one time. Two cans in position on the rollers 14 prevent the admission of any more cans to the machine until the two have been removed from the rollers and positioned in the case. The case, during its forward movement towards the approaching cans does not move far enough forward to give clearance for the admission of the succeeding case with the result that the succeeding case is held out of the machine until the first case has been filled and discharged from the machine.

In operation, cans gravitate down the chute 15 until two are in position upon the rollers 14. The sprocket chains 28 are rotating continuously and the lugs 29 upon coming in contact with the two cans 30 carry the cans along before them (to the right as shown in Fig. 2). In the meantime a case 31, adapted to contain two cans such as 30, has been fed to the machine by the mechanism 16 and has been picked up by the lugs 36 on the sprocket chains 34 and carried forward, or to the left as shown in Fig. 2. The case 31 continues to advance, its bottom side slipping under the guide 53, until the forward edge of the case comes in contact with the stop 54, when the forward movement of the case ceases.

When the movement of the case 31 is arrested by the stop 54, the lugs 36 and sprocket chains 34 can no longer advance and the resistance in the clutch 37 is greatly increased thereby causing the clutch to slip, while the cans 30 which are advancing from the opposite direction are forced into position in the case. As the cans 30 advance towards the case they encounter the pivoted guide 52 which precedes them into the case 31 and in effect lines the upper side of the case so that there is no tendency for the cans to hang up on any projecting edges inside the case.

The operation of the cam 46 is so timed that as soon as a case comes in contact with the stop 54, or shortly thereafter the raised portion of the cam 46 comes in contact with the roller 48 so that the clutch retaining lever 42 is moved outwardly permitting the clutch 37 to entirely disengage. The forward movement of the sprocket chains 34 is thus arrested, while the movement of the sprocket chains 28 continues. Thus the lugs 29 which now engage the edge of the box move the box containing the cans to the right (as viewed in Fig. 2) and discharge the box onto a roller chute 80 which is secured at one end of the supporting frame-work. Obviously with the clutch out of engagement the lugs 29 on chains 28 now move not only the filled case but also carry back chains 34 by reason of the engagement of lugs 36 with the case, the chain 34 riding on idler sprockets 35. Suitable guide members 56 are provided to insure that the box shall be properly deposited on the chute. The chute 80 is positioned somewhat below the level of the sprocket chains 28 and connecting the chute with the end of the supporting frame-work is an inclined rack 57 down which the filled cases drop to the chute. The rack 57 consists of a pair of beams at the lower end of each of which is a shoulder 58 against which the descending cases strike, the force of the impact being sufficient to in effect throw or turn the cases onto the roller chute 80 in an upright position,—that is, with the open end up.

If desired, the supporting frame-work may be provided with a flat top, such as 59, but the top must necessarily be made up of several sections in order to provide sufficient spaces between the sections for the operation of the sprocket chains 28 and 34.

Apparatus of preferred form and construction has been illustrated and described for the purpose of showing a way in which this invention may be practiced, but the in-

ventive thought upon which this application is based is broader than this illustrative embodiment thereof. It is, therefore, understood that the scope of the invention is not to be limited by the present disclosure, reference being had to the appended claims for that purpose.

What I claim is:

1. A can casing machine comprising means for supplying cases to the machine, means for supplying cans to the machine, means for automatically and successively conveying a can into each of the cases and for subsequently ejecting the filled cases from the machine.

2. A can casing machine comprising means for continuously supplying cans to the machine, means for continuously supplying cases to the machine, and means for simultaneously conveying a pair of cans directly into one of the cases and for subsequently removing the filled case.

3. A can casing machine comprising means for supplying cans to the machine, means for supplying cases to the machine, means for conveying one of the cases in one direction, means for conveying a pair of cans in the opposite direction and into said advancing case, and means for guiding the case and the cans to insure proper seating of the cans within the case.

4. A can casing machine comprising means for supplying cans to the machine, means for initially positioning the cans in the machine, means for supplying cases to the machine, means for moving a case in one direction, means for advancing a can in the opposite direction to insert it in the case and for subsequently removing the filled case from the machine.

5. A can casing machine comprising means for supplying cans to the machine, means for supplying cases to the machine, means for moving a case in one direction, means for moving a can in the opposite direction and into the case, and means for checking the forward movement of the case while the can is forced therein.

6. A can casing machine comprising means for supplying cans to the machine, means for supplying cases to the machine, means for conveying a case in one direction, means for simultaneously conveying a can in the opposite direction and into said case, and means for temporarily lining a portion of the inside of said case to insure the proper seating of said can therein.

7. A can casing machine comprising means for supplying cans to the machine, means for supplying cases to the machine, a trevelling conveyor for carrying a case in one direction, a travelling conveyor for carrying a can in the opposite direction and into the said case, and means for temporarily stopping the first named conveyor while the second named conveyor discharges the filled case from the machine.

8. A can casing machine comprising means for supplying cans to the machine, means for supplying cases to the machine, a travelling conveyor for carrying a case in one direction, a travelling conveyor for carrying a can in the opposite direction and into the said case, means for temporarily stopping the first named conveyor while the second named conveyor carries the filled cases off, and means for controlling the stopping of said first named conveyor.

9. A can casing machine comprising a travelling conveyor for carrying a case in one direction, a travelling conveyor for carrying a can in the opposite direction and into the case, and means for stopping one of said conveyors while the other discharges the filled case from the machine.

10. A can casing machine comprising a travelling conveyor adapted to move in one direction, a second travelling conveyor parallel to the first and adapted to travel in the opposite direction, and means operatively connected with both of said conveyors for stopping the forward movement of one of said conveyors at a predetermined point in the cycle of rotation of the other conveyor.

11. A can casing machine, a travelling conveyor for carrying a case in one direction, a travelling conveyor for carrying a can in the opposite direction and into the case, means for driving said conveyors, means for checking the forward movement of the case-carrying conveyor during the positioning of the can in the case, and means for automatically releasing the driving mechanism of the case-carrying conveyor so that the filled case can be discharged from the machine by the can-carrying conveyor.

12. A can casing machine comprising means for supplying cans to the machine, means for supplying cases to the machine, a travelling conveyor for carrying a case in one direction, a second travelling conveyor for carrying a can in the opposite direction and into the advancing case, means for checking the advance of the case while the can is forced therein, and means for automatically releasing the first named conveyor to permit the second named conveyor to discharge the filled case from the machine.

13. A can casing machine comprising a travelling conveyor for carrying a case in one direction, a travelling conveyor for carrying a can in the opposite direction and into the case, means for driving said conveyors, means for checking the forward movement of the case carrying conveyor during the positioning of the can in the case, means for disengaging the driving mechanism of the case-carrying conveyor when its forward movement is checked, and

means on the case carrying conveyor adapted to engage the case so that the direction of movement of said conveyor is reversed while the can carrying conveyor discharges the filled case from the machine.

14. A can casing machine comprising a conveyor for moving a case in one direction and a second conveyor for moving a can in the opposite direction and into the case.

15. A can casing machine comprising an endless conveyor formed with spaced lugs and arranged to convey a case in a given direction and a second endless conveyor formed with spaced lugs and arranged to convey a can in the opposite direction and into the case.

16. A can casing machine comprising means for conveying a case in a predetermined direction and a second means for simultaneously conveying a can in another direction and into the case.

17. A can casing machine comprising means for conveying a case in one direction and means operating in synchronism therewith for conveying a can in another direction and into the case.

18. A can casing machine comprising means for conveying a case in a predetermined direction, means conveying a can in another direction and into the case, and means for periodically checking the movement of one of said means while the other of said means removes the filled case from the machine.

In witness whereof I have hereunto set my hand this 22nd day of May, 1925.

LEON TITUS.