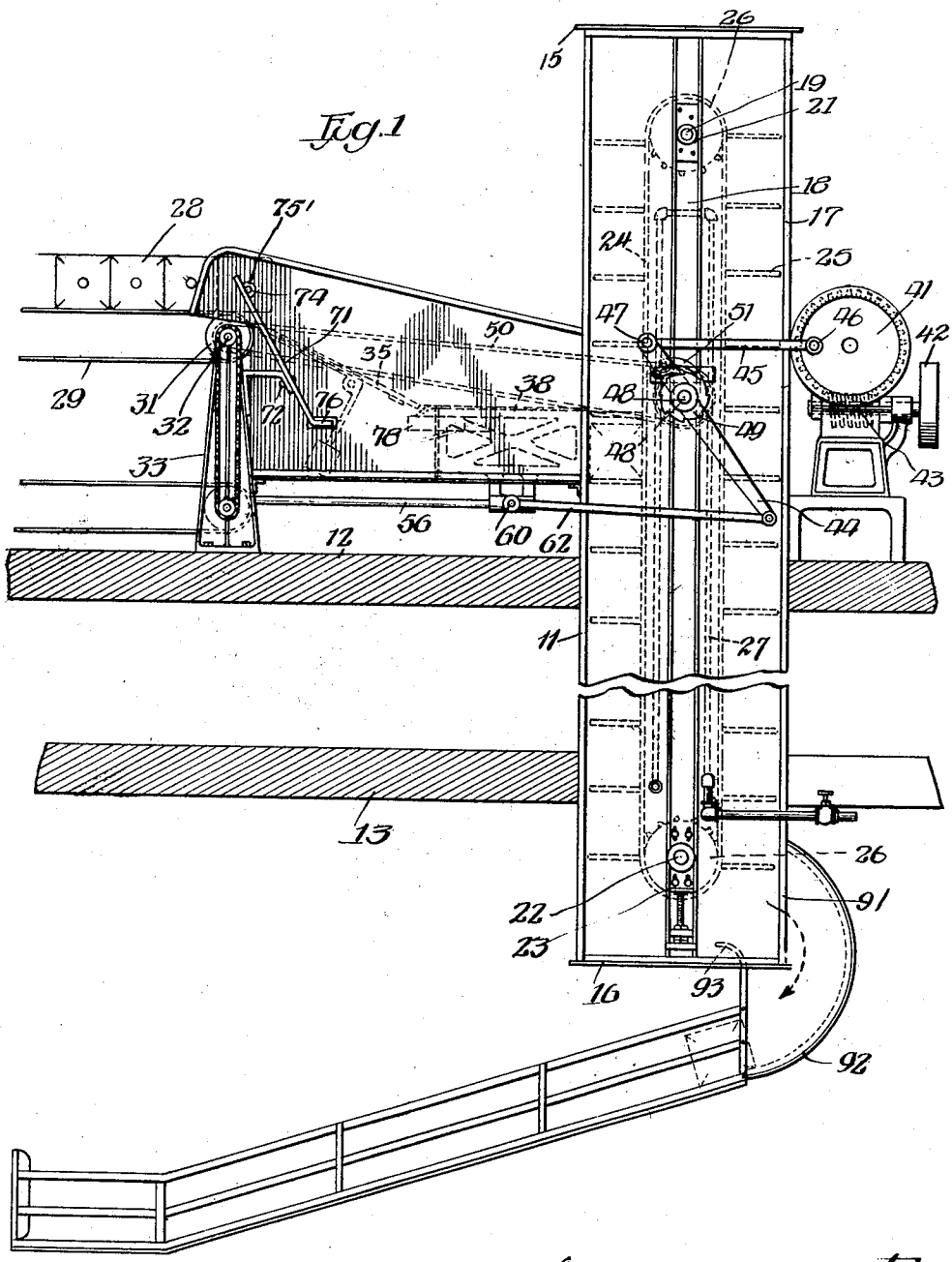
Aug. 11, 1925. 1,549,070

L. F. DILLON

CAN DRIER

Filed Feb. 18, 1916 3 Sheets-Sheet 1

Fig. 1



Witnesses:
N. G. Barrett
H. Carpenter

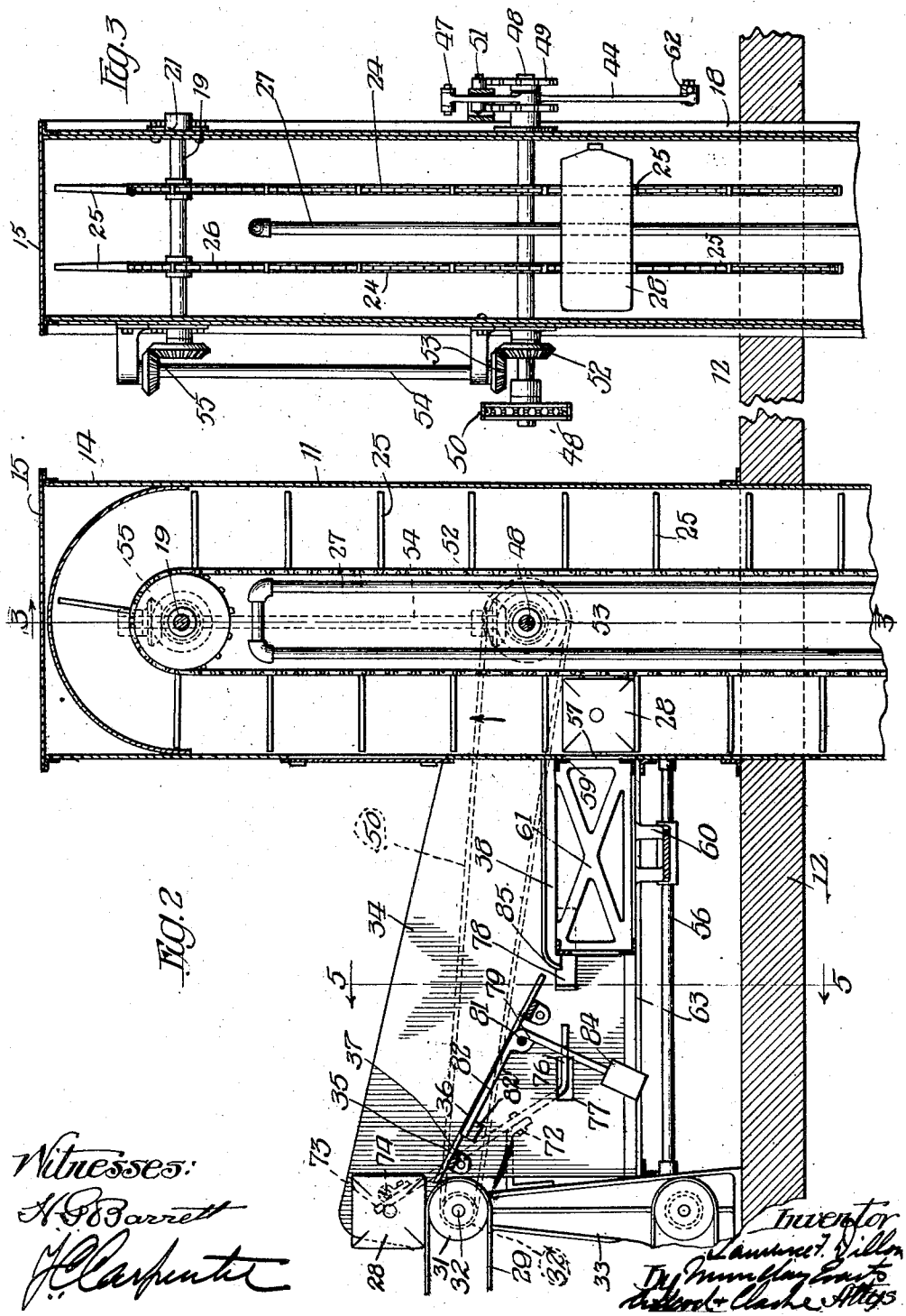
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CAN DRIER

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CAN DRIER

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Fig. 4

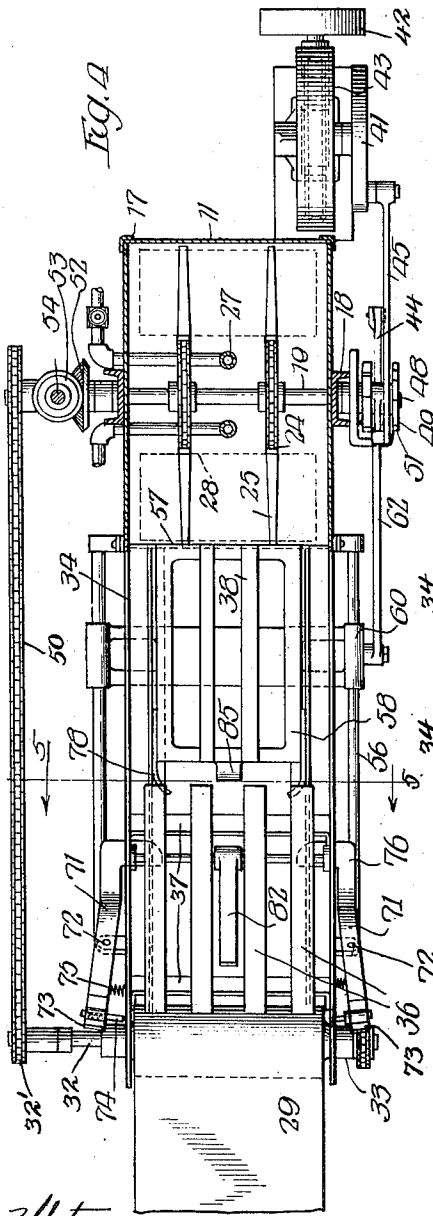
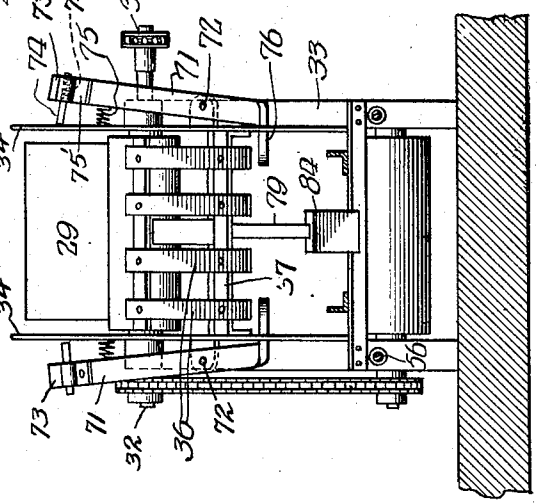


Fig. 5



Witnesses

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Patented Aug. 11, 1925. 1,549,070

UNITED STATES PATENT OFFICE.

LAURENCE F. DILLON, OF MELROSE PARK, ILLINOIS, ASSIGNOR TO AMERICAN CAN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

CAN DRIER.

Application filed February 18, 1916. Serial No. 79,035.

To all whom it may concern:

Be it known that I, LAURENCE F. DILLON, a citizen of the United States, residing in Melrose Park, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Can Driers, of which the following is a specification.

This invention relates in general to can conveying and drying apparatus and has for its object broadly the provision of an apparatus of this character adapted to dry cans tested under water while they are being carried to the storage room or station.

An important object of the invention is the provision of such an apparatus which will be capable of handling large capacity cans, receiving them in wet condition from testing and delivering them dried and ready for storing.

Another object of the invention is the provision of such an apparatus which will receive the wet cans on one floor and deliver them dried on another floor, and this regardless of whether the cans be of round, square or other cross-section.

A still further object of the invention is the provision of such an apparatus which will require no particular attention during its operation and which will operate effectively and without damage to the cans, regardless of whether said cans are presented at a regulated continuous rate or not.

Other objects and advantages of the invention will be apparent as it is better understood from the following description when considered in connection with the accompanying drawing illustrating a preferred embodiment thereof.

On the drawings,

Fig. 1 is a side elevation of an apparatus embodying my present invention;

Fig. 2 is a partial longitudinal vertical section of the apparatus shown in Fig. 1;

Fig. 3 is a similar section taken substantially on the line 3—3 of Fig. 2;

Fig. 4 is a top plan view of the same with the top of the casing forming the heating chamber removed; and

Fig. 5 is a section taken substantially on the line 5—5 of Fig. 2.

For the purpose of illustrating my invention I have shown on the drawing an apparatus adapted to dry and convey large tin cans square in cross-section. As will be appreciated, these cans do not roll and consequently present difficulties in transferring them from one station to another through a drying apparatus not present when the apparatus is used for cans circular or round in cross-section. It will, however, be understood that this invention has effective and valuable use not only with the square cans but with the round ones as well.

Referring to the drawing, 11 designates a casing which extends through one or more floors 12, 13. This casing is of rectangular form and is constructed in the present instance of sheet metal side walls 14 and sheet metal top and bottom walls 15 and 16, these walls being reinforced by angle irons 17 (Fig. 4) and channel irons 18 as may be required. In the present instance two channel irons 18 are provided, one extending along each side of the casing. A conveyor shaft 19 is journaled at its ends in bearing plates 21 near the top of these channel irons and a similar shaft 22 is journaled in bearing plates 23 near their bottoms. A conveyor or carrier composed of two belts 24 and outwardly extending leaf flights 25 is trained over sprocket wheels 26 on the shafts 21 and 22. The bearing plate 23 is adjusted to tighten or loosen the chains or belts 24 to maintain the desired tightness in the conveyor or carrier.

The casing 11 is heated internally by coils 27 of steam, hot water or other heating medium. The cans generally designated as 28 approach the casing upon an endless traveling conveyor 29 from the tester (which is not shown). At the delivery end the conveyor 29 travels over sprocket wheels 31 on a shaft 32 which is mounted in standards 33 near the casing. From the forward end of the conveyor, side plates 34 extend to the casing and in between these side plates is mounted a transfer mechanism for delivering the cans into the casing and onto its conveyor or carrier. An inclined framework 35 (Fig. 2) of bars 36 is secured by brackets 37 to and between the side plates and extends from adjacent the forward edge of the operative travel of the conveyor 29 downwardly and forwardly to a reciprocating transfer member 38.

The cans are brought by the conveyor to the forward end of its operative travel and are there held for suitable delivery to the transfer mechanism which intermittently delivers them to the conveyor or carrier in the

casing. The conveyor or carrier in the casing has an intermittent motion in synchronism with the transfer member and with the delivery of cans by it, and the conveyor 29 also travels in synchronism with the conveyor in the casing and with the transfer member. The carrier is moved from a crank disk 41 (Figs. 1 and 4) which receives power from a pulley 42 through a worm drive 43. The crank disk continuously produces oscillation of a lever 44 through a link 45 connected to it at 46 and to the lever at 47. This lever is loose upon a shaft at 48 on which is fastened a ratchet wheel 49, in the teeth of which engages a pawl 51 pivoted on the lever. The shaft 48 is journaled in the channel irons 18 and carries at its opposite end a bevel gear or pinion 52 (Fig. 3) meshing with a corresponding bevel gear or pinion 53 upon an end of a vertical shaft 54. This shaft has a bevel gear connection 55 with the upper shaft 21 of the conveyor 24, so that the conveyor receives intermittently a forward motion under the influence of and in accordance with the movement of the transfer member and its operating mechanism to perform the carrying thus described. The conveyor 29 is given a similar movement by a sprocket chain 50 taking a gear 48′ (Fig. 3) on the shaft 48 and a gear 32′ (Fig. 5) on the shaft 32.

The transfer member 38 is caused to reciprocate, and at each reciprocation to deliver a can into the casing 11, by the lever 44 and to this end is slidably mounted upon ways 56. As cans slide down the framework 35, which with the sides 34 forms a chute, they arrive first upon the top of the transfer member and then fall in front of it, as in its reciprocation it moves away from the casing. Upon its return stroke the transfer member pushes the can through an opening 57 in the casing and onto an appropriate flight 25 of the carrier 24. The transfer member, in the present instance, is provided with a flat framework 58 (Fig. 4) which forms its top and carries at its forward ends a pair of transversely disposed angle irons 59, (Fig. 2) which, together with the top are secured to supporting sides 61, from which depend perforated arms 60 through which the guides 56 extend. The transfer member receives its motion from the lever 44 through a link 62 (Figs. 1 and 4) connected to an arm 60 at one end and to the end of the lever 44 at the other. The cans in falling from the transfer member land upon a stationary grid or floor 63 (Fig. 2) on a level with the lower edge of the opening 57 in the casing 11. To control the delivery of cans to the transfer member I provide the devices now to be described. A pair of levers 71 (Fig. 5) are pivoted at 72 in brackets extending outwardly from the side walls 34. These arms extend upwardly and rearwardly so that their upper ends 73 are disposed adjacent the oppositely presented faces of cans upon the conveyor 29. In the present instance these faces are the ends of the cans. The ends 73 of these arms carry spring-controlled fingers 74 pressed inward by springs 74′ within the bearings 75′ of the fingers (Fig. 5) and adapted to be projected across the conveyor and into engagement with the ends of a can resting thereon, this action being permitted by the provision of springs 75 which press the upper ends of the arms outward. The lower ends or arms 76 of the levers 71 extend inwardly toward each other and are movable through slots 77 (Fig. 2) in the side walls. These ends are disposed in the line of travel of the transfer member and are engageable by rearwardly extending curved leaves or strips 78, which, as the carrier travels rearwardly, move the levers about their pivotal connection to release a can at the end of the forward travel of the conveyor 29, permit it to slide down the frame 35 and onto the forward end of the frame 58 forming the top of the transfer member. The transfer member moves on rearwardly and the end of the chute pushes the can off the transfer member so that it falls upon the grid 63 over which it is carried to the casing on the return or forward movement of the transfer member. At the end of this movement the transfer member pushes the can through the opening 57 and onto the flight 25 which, when the machine is properly constructed, is in readiness to receive it.

In order that the cans may not be permitted to become jammed or stuck fast in the chute, a bell crank 79 (Fig. 2) is pivoted just below the framework 35 at 81. One arm 82 of this bell crank normally reposes in the plane of the frame 35 and the other arm carries a weight 84, which in cooperation with a stop 82′ normally maintains the bell crank in the position shown in Fig. 2. As the transfer member moves rearwardly the weighted arm is engaged by a downwardly curved lip 85 secured upon the rear end of the transfer member, moving the bell crank about its pivot and elevating its arm 82, which positively pushes any can upon the chute over onto the transfer member. The transfer member thus actuates the pressure members or fingers and the bell crank, which may be termed a can actuating member, actuation of the pressure fingers occurring in advance of the bell crank. These parts are preferably so arranged that the can will slide down onto the transfer member before actuation of the bell crank. Should the pressure fingers permit more than a single can to pass at one actuation, the bell crank will hold back all but the first one and control the delivery until a gap in the cans on the conveyor re-establishes the normal run-

ning conditions. This action is aided by the intermittent action given the conveyor 29 by the sprocket chain 50, which also prevents the cans from crowding up behind the can held by the fingers with sufficient force to interfere with the effective action of the fingers.

In the operation of my can-conveying and drying machine, the cans to be dried, ordinarily coming from the can tester, are advanced by the conveyor 29 and descend one in advance of another by gravity along the chute or incline 35 to a position on the top of the transfer member 38. This movement is regulated and timed by the can gripping levers 71 which hold the can at the end of the conveyor 29 until the transfer member is partly retracted under said incline, so that only one can is allowed to slide down for each complete reciprocation of said transfer member. It will be understood that the speed of the conveyor 29 is such that it advances approximately the width of a can during the interval of time between the releasing movement and the gripping movement of the levers 71. The said sliding of the cans in the chute is insured and jamming of them therein is prevented by the upward and forward swinging of the arm 82. A can being on the transfer member the retraction of the latter continues and the can, bearing against the front edge of the incline, is held from retraction and falls on the grid 63 in front of the transfer member. The immediately succeeding forward stroke of the latter transfers the can on to a flight 25 of the drier (Fig. 2) which carries it upward. At the next succeeding reciprocation of the transfer member the above operations are repeated and the next can will be deposited on the next flight 25 which is timed to arrive for the purpose.

The cans on being received by the conveyer in the casing 11, by the operation of the conveyer 29 and transfer mechanism, are carried upwardly and over the upper sprocket wheels 26. The flights of the conveyor are preferably spaced apart only a sufficient distance to give proper clearance to the cans carried by them, for as the conveyor passes over the top of its travel the can leaves the forward face of one flight and on a downward travel rests upon the rear face of the flight next in advance of it.

At the bottom the cans are ejected from the casing and fall through an opening 91 (Fig. 1) into a chute 92, down which they slide either to another set of conveyors or to a receiving table, from which attendants may remove them for packing or storage. The chute 92 encloses the opening 91 in the present instance and is provided with an inwardly extending part 93 which is curved and positively directs the cans out of the casing.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing any of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In an apparatus of the character described the combination of actuating mechanism, an endless conveyor, a reciprocating transfer member having means for placing a can received from said conveyor, a yielding pressure member, and opposing means adapted to press upon a face of the can presented at a side of said conveyor to restrain movement thereof, said pressure member being releasable by said transfer member.

2. In an apparatus of the character described the combination of an endless traveling conveyor, a reciprocating transfer member having means for placing a can received from said conveyor, and a pair of arms each having an end adapted to be projected across said conveyor and into engagement with a face of a can presented at the sides of said conveyor and having a second end engageable by said reciprocating transfer member to cause said engagement with a can, said transfer member having a movement to release said second end to permit the delivery of the can to said transfer member.

3. In an apparatus of the character described the combination of an endless conveyor, a transfer member, a chute leading from said conveyor to said transfer member, and reciprocating means in said chute and intermittently engageable with the rear sides of the cans for preventing cans lodging in said chute, said means being operable by said transfer member.

4. In an apparatus of the character described the combination of an endless traveling conveyor, a reciprocating transfer member, actuating mechanism for said conveyor and transfer member, a chute leading from said conveyor to said transfer member, pressure means for restraining cans on said conveyor, and can accelerating means in said chute for preventing cans from reposing therein, both said means being operable by said transfer member.

5. In an apparatus of the character described the combination of an endless traveling conveyor, a reciprocating transfer member, actuating mechanism for said conveyor and transfer member, a chute leading from said conveyor to said transfer member, pressure means for restraining cans on said conveyor, and can accelerating means in said chute for preventing cans from reposing therein, both said means being operable by

said transfer member, said pressure means in advance of said can accelerating means.

6. In an apparatus of the character described the combination of an endless conveyor, and a transfer member for receiving cans from said conveyor, and means for guiding the cans in their passage from said conveyor to said transfer member, said transfer member and said conveyor being each intermittently operated.

7. In a can drier, in combination: a drier casing; a can conveyer therein; a can-feeding conveyer; a reciprocating transfer device and guiding means operating on the cans delivered by the said feeding conveyer to transfer the same to said can conveyer in the casing; and means for intermittently gripping and releasing the cans to regulate their delivery to the said transfer device.

8. In a can drier, in combination: a drier casing; a can-carrying conveyer in said casing; an intermittent conveyer; a delivery chute leading from the latter; means for intermittently gripping the cans near the end of said intermittent conveyer; and a reciprocating transfer device having means for actuating the gripping means and adapted to transfer the cans to the conveyer within the drier casing.

9. The combination of a drying conveyer, a feeding conveyer for supplying cans to be placed on said drying conveyer, and a transfer member movable towards and away from the drying conveyer and arranged to receive cans from the feeding conveyer, said transfer member having means for placing a can onto the drying conveyer and means for arresting a can in an intermediate position between the delivery end of the feeding conveyer and the drying conveyer, the transfer member acting on its movement away from the drying conveyer to deposit the arrested can in final position to be placed on the drying conveyer by the return movement of the transfer member.

10. In a can conveying apparatus the combination of two endless conveyers arranged and traveling at an angle to each other, the first conveyer adapted to advance and supply a succession of cans and the second conveyer being provided with flights adapted to receive said cans and convey them for drying or other desired purpose, can-holding means adapted to hold momentarily and to release one after another the cans as they are supplied by the first conveyer, a reciprocating transfer member movable alternately towards and from the second conveyer and receiving cans successively from said can-holding means and then placing the cans on the flights of the second conveyer, and mechanism for actuating said conveyers, and can-holding means and transfer member in timed relation.

In testimony whereof, I have hereunto set my hand in the presence of two subscribing witnesses.

LAURENCE F. DILLON.

Witnesses:
J. C. CARPENTER,
ESTHER ABRAMS.