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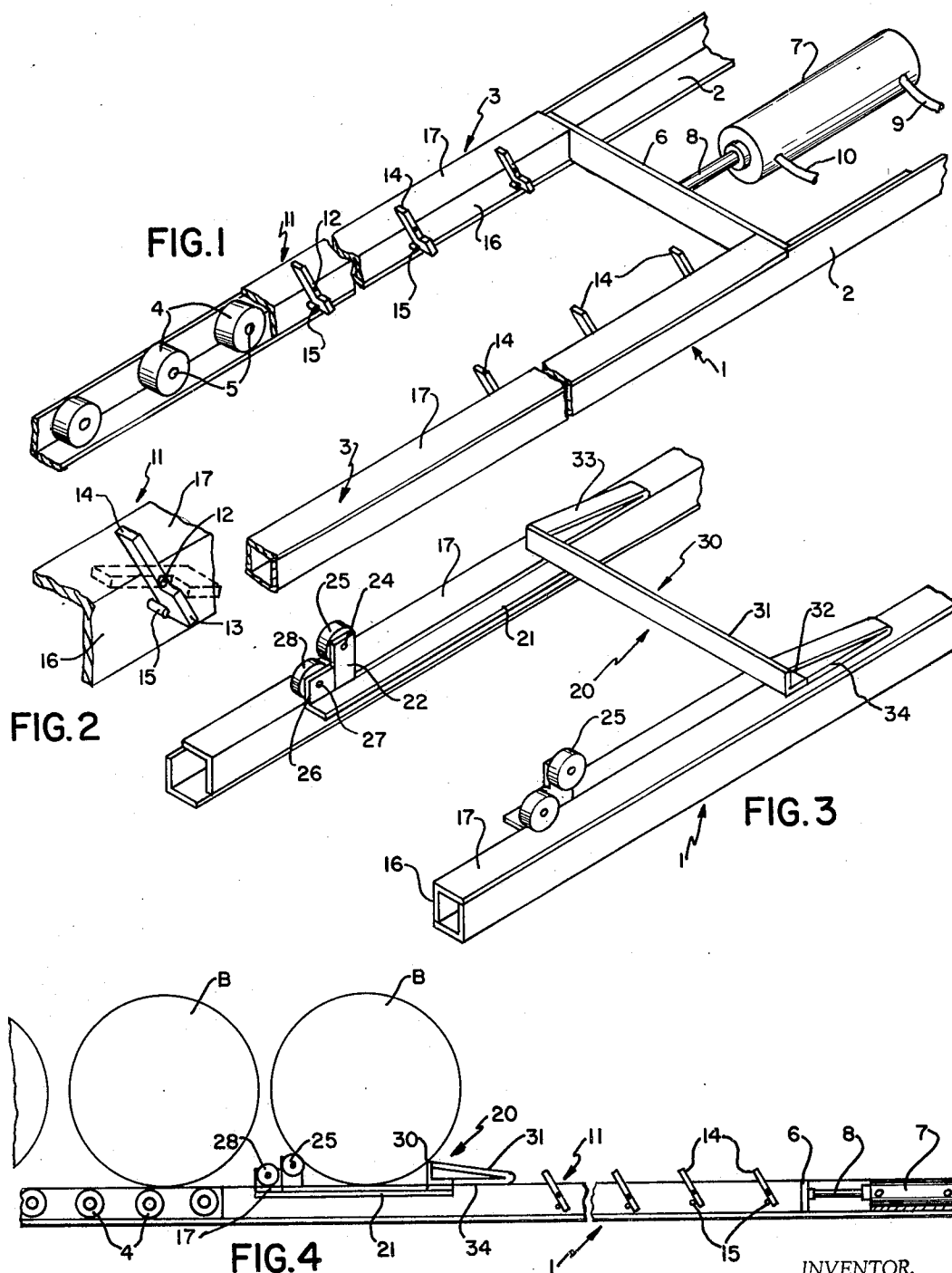
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3,486,609

BARREL DRIVING AND CHOCKING DEVICE

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BARREL DRIVING AND CHOCKING DEVICE
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14 Claims

ABSTRACT OF THE DISCLOSURE

Discloses a device in the form of a reciprocating track for overcoming the static rotational inertia of a line of barrels. Discloses additionally in two embodiments apparatus allowing the rotation of the barrel to be translated to linear movement in a desired direction but to be chocked in an undesired direction. In one embodiment the driving and chocking members are a series of pawls pivotably mounted so as to be rotatable in one direction and in another embodiment there is disclosed a driving and chocking member which allows the barrel to move forwardly when rotating in one direction but which coacts with the undesired rotary direction of the barrel to frictionally engage the device on the track.

BACKGROUND OF THE INVENTION

This invention relates to a track comprising a pair of rails for conveying barrels from one location to another. More specifically, this invention relates to a reciprocating track wherein the linear reciprocating movement of the track is translated into rotary motion of the barrels. More specifically, this invention involves apparatus which will allow the rotary movement of the barrel to be translated into linear movement in a desired direction but which chocks the barrels rotary movement in an undesired direction.

DESCRIPTION OF THE PRIOR ART

Traditionally, in the whiskey industry, barrels have been moved from one location to another on an inclined track or on a track wherein the barrels were pushed along manually. The use of an inclined track is complicated by the fact that in some instances the barrels are full, whereas, in other instances the barrels are empty. Accordingly, the rotational inertia of the barrels varies. For this reason, it is impractical to provide a track with too steep an incline since it is possible that one or more barrels may get away and break open thus spilling the contents.

Secondly, the movement of a line of barrels along a track is complicated further by the fact that as the rotary motion of the barrel is translated into its own linear movement the preceding barrel comes into contact with the rotating succeeding barrel so that a point of friction develops between the barrels at the point of contact thus tending to stop or impede the rotary motion of both barrels and thus their linear motion down the track. This, coupled with the fact that the barrels are still primarily hand made and contain uneven staves, tends to cause more friction in between barrels than would be the case, as for example, with metal kegs or drums.

The appreciation of this problem is not new since in many industries, feed chutes have been designed to keep cylindrical objects such as gears from coming into contact with each other and thus damaging the gear teeth and becoming locked together. See for example the patent to Bassoff, 2,644,564, and the patent to Jessup et al., 2,903,116. As applied to barrels, the patent to Holmes et al., 235,531, provided a series of pawls pivotably mounted along a pair of skids or rails which were rotatable forwardly to allow the barrels to roll over said pawls

and which were connected to a rod and lever which could be manipulated to push the barrels forwardly in the event two or more barrels became locked together.

SUMMARY OF THE INVENTION

According to my invention, the static rotational inertia of the barrel as well as the frictional engagement of one barrel against another, is overcome by means of a reciprocating track which reciprocates axially through a relatively slow stroke (as distinguished from a vibrating conveyor). If the track is inclined, the forward stroke of the track through friction causes the barrel to rotate in a direction which is translatable to rearward linear movement. However, the force of gravity is generally sufficient to prevent the barrels moving in the undesired direction. On the rearward stroke of the track, however, the barrels are then rotated in a direction translatable to forward or desired movement thus overcoming the static rotational inertia of the barrels as well as the braking effect of friction imposed by the contact of one barrel against another. To insure movement of the barrels along the reciprocating track in the desired direction, there is provided means whereby the undesired rotation of the barrel is chocked and the barrel is actually pushed forward during the forward stroke of the track while allowing the rotation of the barrel translatable into forward motion to be utilized during the rearward stroke of the rails. In one embodiment of the invention, a specific driving and chocking device is utilized, wherein there is coaction between the force of the rearward rotation of the barrel and the device to frictionally engage the device on the track and thus push the line of barrels forwardly during the forward stroke while allowing the rotation of the barrel in coaction with the track during the rearward stroke to push the device forwardly through translation of the rotation of the barrel to forward movement.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view in perspective of a desired form of reciprocating track and driving means.

FIG. 2 is a fragmentary view in perspective illustrating the pawls in substantially vertical position and in forwardly rotatable position.

FIG. 3 is a view in perspective illustrating a portion of the track having the driving and chocking device of my invention mounted thereon.

FIG. 4 is a side elevation with portions broken away to show: portions of the reciprocating track, the driving and chocking pawls, and the driving and chocking device mounted thereon, to illustrate the relationship of the barrels thereto.

FIG. 5 is a diagrammatic view illustrating the reciprocating track on its forward stroke and the coaction of the barrels thereto.

FIG. 6 is a fragmentary diagrammatic view of the reciprocating track on its forward stroke having a driving and chocking device and a barrel mounted thereon and illustrating the coaction of the barrel with the track and with the driving and chocking device.

FIG. 7 is a diagrammatic view of a reciprocating track on its backward stroke and the coaction of the barrels thereto.

FIG. 8 is a fragmentary diagrammatic view of the reciprocating track on the backward stroke having a driving and chocking device and a barrel mounted thereon to illustrate the coaction of the barrel with the track and with the driving and chocking device.

FIG. 9 is a semi-diagrammatic side elevation, partially in section, illustrating a modified driving means for the reciprocating track.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings in detail, the reciprocating track 1 is made up of an inverted angle iron 2 and an angle iron 3 consisting of a depending leg 16 and a horizontal leg 17. Mounted on the medial surface of the vertical leg of angle iron 2 are a series of rollers 4 journaled on pins 5. A transverse connecting member 6 is joined to the two angle irons 3 so as to move same as a unit. A double acting cylinder 7 containing a piston rod 8 operatively connected to transverse connecting member 6 contains line 9 which acts to extend rod 8 and line 10 which acts to retract rod 8 through about an 8 inch stroke. A series of pawls 11 are pivotably mounted on the depending leg 16 of angle iron 3 by pins 12. The pawls 11 are L shaped so that the foot 13 of the L extends medially and the leg 14 of the L extends above the horizontal surface 17 of angle iron 3 so as to be in contact with barrel B. The pin 12 is mounted above the center of gravity of the pawl 11 so that it gravitationally assumes an essentially vertical position. Stop 15 engages with the foot 13 of pawl 11 so as to tilt the leg 14 forwardly in chocking relation to barrel B but allows the pawl to pivot forwardly as shown in FIG. 2. The forward rotation of pawl 11 allows the barrels to roll in a desired rotation without impedance but chocks the barrel if it starts to roll in a rearward direction.

As is best illustrated in FIG. 3, the driving and chocking device 20 is shown mounted on the horizontal leg 17 of angle iron 3. It will be noted that two connecting members 21 in the form of metal bars are mounted just below the surface of the horizontal leg 17 of angle iron 3. Connected at the forward end of the connecting members 21 is a vertical leg 22 containing pin 24 on which roller 25 is rotatively mounted as a friction reducing barrel engaging means. Forwardly adjacent to leg 22 is vertical leg 26 containing pin 27 on which roller 28 is rotatively mounted for contact with horizontal leg 17 of angle iron 3 as a friction reducing mounting means for the driving and chocking device 20. At the rear of the device 20 is a braking member 30 in the form of an angle iron which acts as a rear barrel engaging means and consists of a vertically disposed leg 31 acting as a braking bar and a horizontally disposed leg 32. Connected to the horizontally disposed leg 32 are two connecting bars 33 which extend between the braking member 30 the metal shoes 34 which are in rubbing contact with the horizontally disposed leg 17 of angle iron 3.

As is best shown in FIG. 9, a modification of the double acting cylinder as a driving means for the reciprocating track 1 is shown in the form of a driven wheel 50 containing eccentrically mounted pin 51 to which driving arm 52 is attached. Driving arm 52 ends in the form of a clevis bracket and is operatively connected to arm 54 by means of clevis pin 53. Arm 54 in turn fits within a clevis bracket 56 which is operatively connected to transverse connecting member 6. A clevis pin 55 holds clevis bracket 56 and arm 54 in operative relation.

As is illustrated in broken lines, the revolution of the driven wheel 50 through means of driving arm 52 pushes arm 54 back and forth in a reciprocating motion thus translating rotary motion of wheel 50 to a reciprocating motion.

OPERATION

Referring now to FIG. 5, a series of barrels B are shown on reciprocating track 1. Track 1 is in its forward stroke 60 so that friction at point 41 between the barrel and the track causes the barrels to rotate in a clockwise direction. If the track is on a level plane, the direction of travel of the barrel 61 is rearwardly or directly opposite to the stroke of the track. However, the rotation of each individual barrel tends to develop friction at point 40 between each barrel thus tending to impede or slow the travel of the barrels along the track. Now if

the track is inclined in the desired direction of travel, the undesired rotation of the barrels is insufficient to cause the barrels to roll rearwardly in the undesired direction 61 as shown. Thus, the forward stroke of the track tends to disengage barrels from each other and thus allows the barrels to roll gravitationally in the direction of the incline. In other words, the forward stroke 60 of track 1 tends to overcome the static rotational inertia of the barrels and also the friction developed at point 40 between the barrels so as to allow the barrels to roll gravitationally in the desired direction. However, if the track is on a level plane as illustrated in FIG. 5, the forward stroke 60 of track 1 tends to cause the barrels to rotate due to friction between the barrels and the track at point 41 in a clockwise direction so that the rotary motion of the barrels is translated to a rearward direction 61 through a translatory force T.

When the chocking and driving device 20 is mounted on the track as shown in FIG. 6, the forward stroke 60 of the track causes the barrel to rotate in a clockwise direction against the braking member 30. In illustrating the various forces, G designates the gravitational pull on the barrel, I designates the inertial component, and V designates a vector or the sum of the gravitational force plus the inertial force. This results in a force 43 on the braking bar 30 thus causing a resultant force R downwardly to frictionally engage shoe 34 to the track 1. Thus, the direction 61 of the barrel B and the driving and chocking member 20 is forward since the driving and chocking member 20 is frictionally engaged to the track and moves forwardly with it.

On the rearward stroke 60 of the reciprocating track 1 as shown in FIG. 7, the friction between the barrel and the track at point 41 causes the barrels to rotate in a counter-clockwise direction resulting in a translatory force T which moves the barrel in a forward direction 61. As shown in FIG. 8, when the driving and chocking member 20 is mounted on the track and the track is on its backwards stroke 60, the force exerted by the barrel's rotation in a counter-clockwise direction due to the friction between the barrel B and track 1 at point 41 reverses the direction of the vector V so that the resultant force R is downwardly from roller 25. This tends to relieve the friction between metal shoe 34 and the track 1 thus allowing the translatory force T of the barrel's rotation to move the driving and chocking member 20 forwardly by means of the friction reducing roller 28.

It is thus seen that by use of the driving and chocking device 20 the forces caused by the coaction of the barrel with the track causes on the forward stroke of the track a coaction between the barrel and the braking member 30 to produce a resultant force R and thus frictionally engage the driving and chocking member 20 to the track to move it and the barrel forwardly. On the rearward stroke, however, the coaction of the barrel and the track at point 41 reverses the vector or the force caused by the rotation of the barrel to allow the translatory force T of the barrel to move it and the driving and chocking device forwardly. Thus there is provided a driving and chocking device for use with a reciprocating track which makes maximum advantage of both the forward and rearward stroke of the track to move a line of barrels in the desired direction.

Many modifications will occur to those skilled in the art from the detailed description hereinabove given and said description is intended to be exemplary in nature and nonlimiting except as to be commensurate in scope with the appended claims.

I claim:

1. A driving and chocking device for use in conveying barrels along a reciprocating track, which comprises:

(A) a front friction reducing barrel engaging member, which allows the barrel to rotate in either direction,

(1) said rotation in a first direction being translatable to forward linear movement and said

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rotation in a second direction being translatable to rearward linear movement;

- (B) a rear braking member, which frictionally retards rotation of said barrel in said second direction;
- (C) connecting members connected to said front barrel engaging member and said rear braking member and mounted so as to allow contact of said barrel with said track so as to translate the reciprocating motion of said track to rotary motion of said barrel in said first and second direction;
- (D) a front friction reducing mounting means for mounting said device onto said track,
 - (1) said friction reducing mounting means allowing the device to move forwardly through translation of the barrel's rotation in said first direction;
- (E) a rear mounting means for mounting said device on said track and which is in frictional relation with said track,
 - (1) said rear mounting means being responsive to the rotational force of said barrel in said second direction on said rear braking member, to frictionally engage said driving and chocking device on said track.
- 2. A driving and chocking device, as defined in claim 1, in which:
 - (A) said front friction reducing barrel engaging member is a roller rotatively mounted so as to be in rubbing contact with said barrel.
- 3. A driving and chocking device, as defined in claim 1, in which:
 - ((A) said rear barrel braking member is a transverse member mounted so that the top edge of said member is in rubbing contact with said barrel and mounted so that forces imposed on said member are transmittable to said rear mounting means.
- 4. A driving and chocking device, as defined in claim 1, in which:
 - (A) said front friction reducing mounting means comprises a roller rotatively mounted in proximity to said front friction reducing barrel engaging member.
- 5. A driving and chocking device, as defined in claim 1, in which:
 - (A) said rear mounting means comprises a pair of shoes in rubbing contact with said track.
- 6. A driving and chocking device, as defined in claim 5:
 - (A) the further combination therewith of a pair of force transmitting members connected to said shoes and to said rear braking member.
- 7. A driving and chocking device, as defined in claim 1, in which:
 - (A) said connecting members are mounted below the levels of the track.
- 8. An apparatus for conveying barrels, including:
 - (A) a pair of spaced parallel rails in which the distance between the rails is less than the height of said barrels;
 - (B) means for overcoming the rotational inertia of said barrels to move said barrels in a desired direction along said rails, comprising:
 - (1) means for reciprocating said rails through a predetermined forward and backward axial stroke;
 - (C) the further combination therewith of a driving and chocking device comprising:
 - (1) friction reducing barrel engaging member, which allows the barrel to rotate in either direction,

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- (a) said rotation in a first direction being translatable to forward linear movement, and,
- (b) said rotation in a second direction being translatable to rearward linear movement;
- (2) a rear barrel braking member which frictionally retards rotation of said barrel in said second direction;
- (3) connecting members in operative relation with said front barrel engaging member and said rear barrel braking member and mounted so as to allow contact of said barrel with track;
- (4) a first friction reducing mounting means for mounting said device onto said track;
 - (a) said friction reducing means allowing the device to move forwardly through translation of the barrel rotation in said first direction;
- (5) a rear mounting for mounting said device on said track and which is in frictional relation with said track;
 - (a) said rear mounting means being responsive to the rotational force of said barrel in said second direction on said rear braking member to frictionally engage said driving and chocking device on said track.

9. An apparatus for conveying barrels, as defined in claim 8, in which:

- (A) said front friction reducing barrel engaging member is a roller rotatively mounted so as to be in rubbing contact with said barrel.

10. An apparatus for conveying barrels, as defined in claim 8, in which:

- (A) said rear barrel braking member is a transverse member mounted so that the top edge of said member is in rubbing contact with said barrel and mounted so that forces imposed on said member are transmittable to said rear mounting means.

11. An apparatus for conveying barrels, as defined in claim 8, in which:

- (A) said front friction reducing mounting means comprises a roller rotatively mounted in proximity to said front friction reducing barrel engaging member.

12. An apparatus for conveying barrels, as defined in claim 8, in which:

- (A) said rear mounting means comprises a pair of metal shoes in rubbing contact with said track.

13. An apparatus for conveying barrels, as defined in claim 8:

- (A) the further combination therewith of a pair of force transmitting members connected to said shoes and to said barrel braking member.

14. An apparatus for conveying barrels, as defined in claim 8 in which:

- (A) said connecting members are mounted below the level of said track.

References Cited

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