

Nov. 17, 1931.

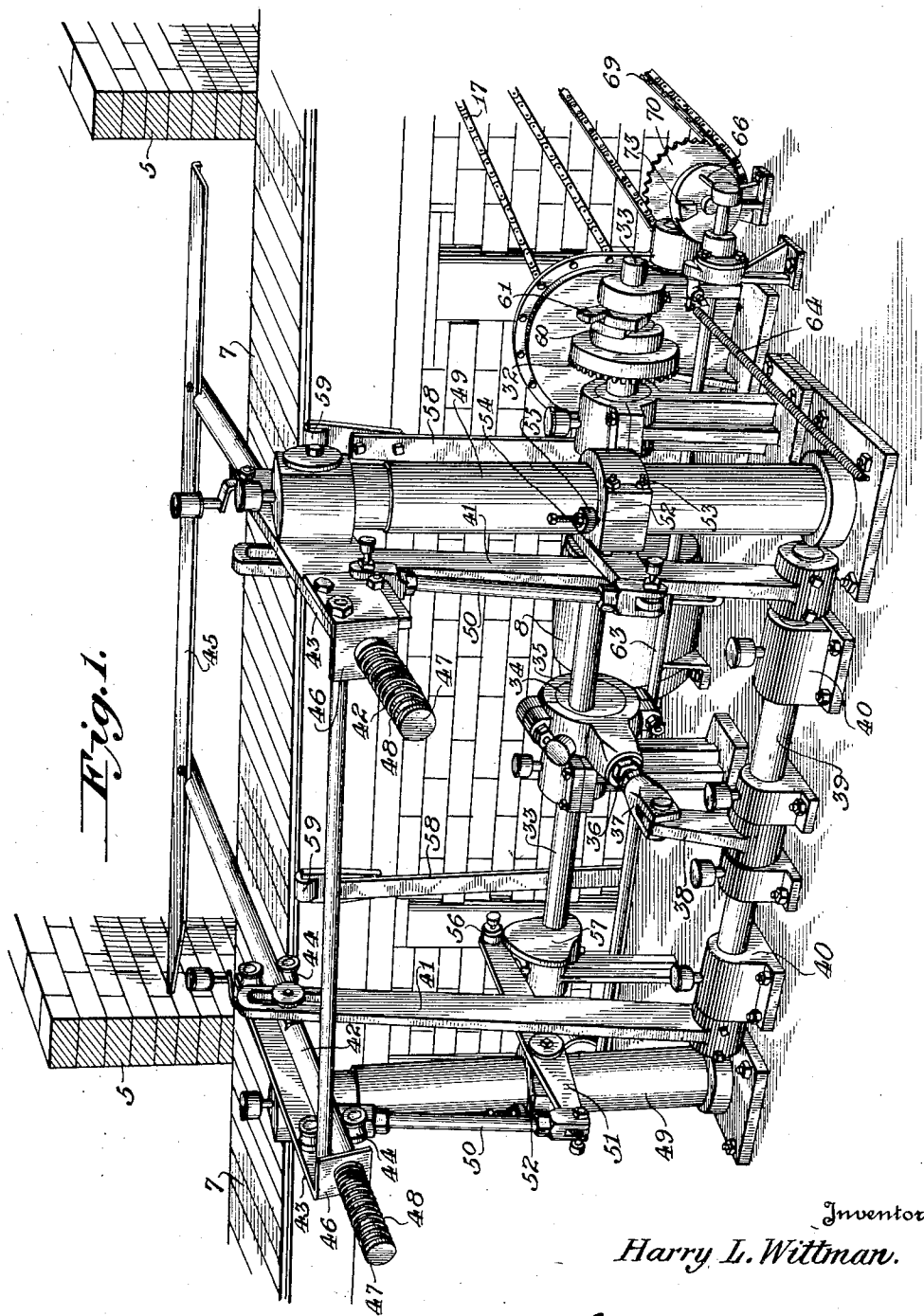
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1,832,343

LEER FEEDER

Filed Dec. 8, 1926

4 Sheets-Sheet 1



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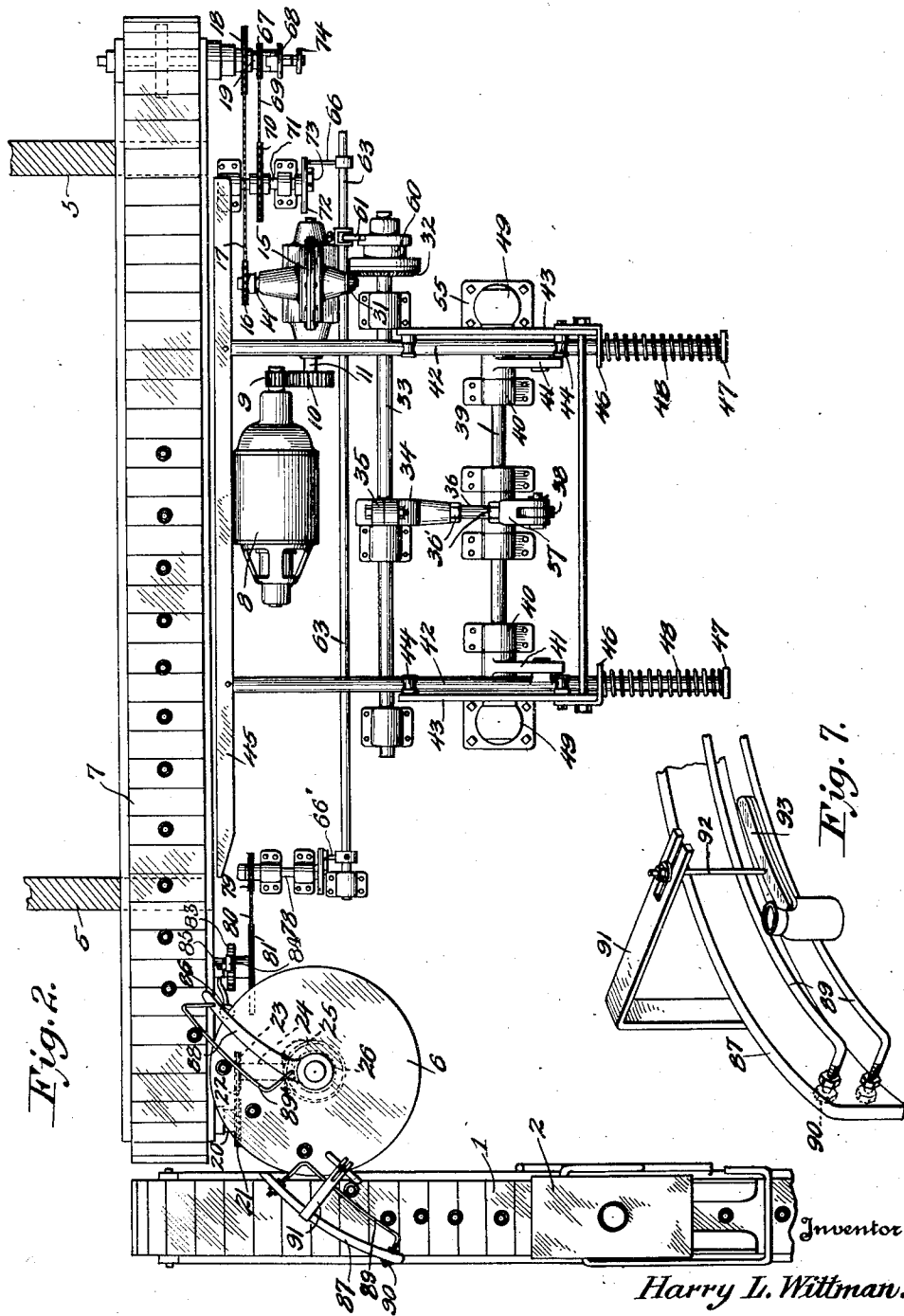
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LEER FEEDER

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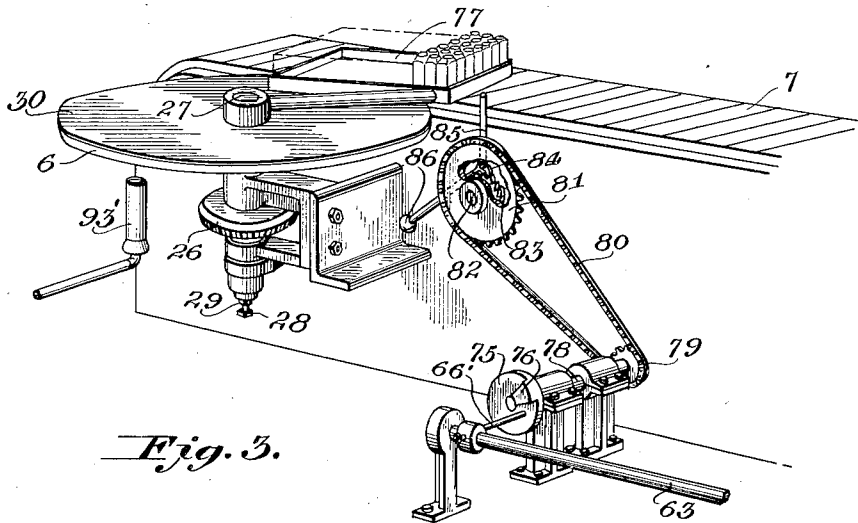


Fig. 3.

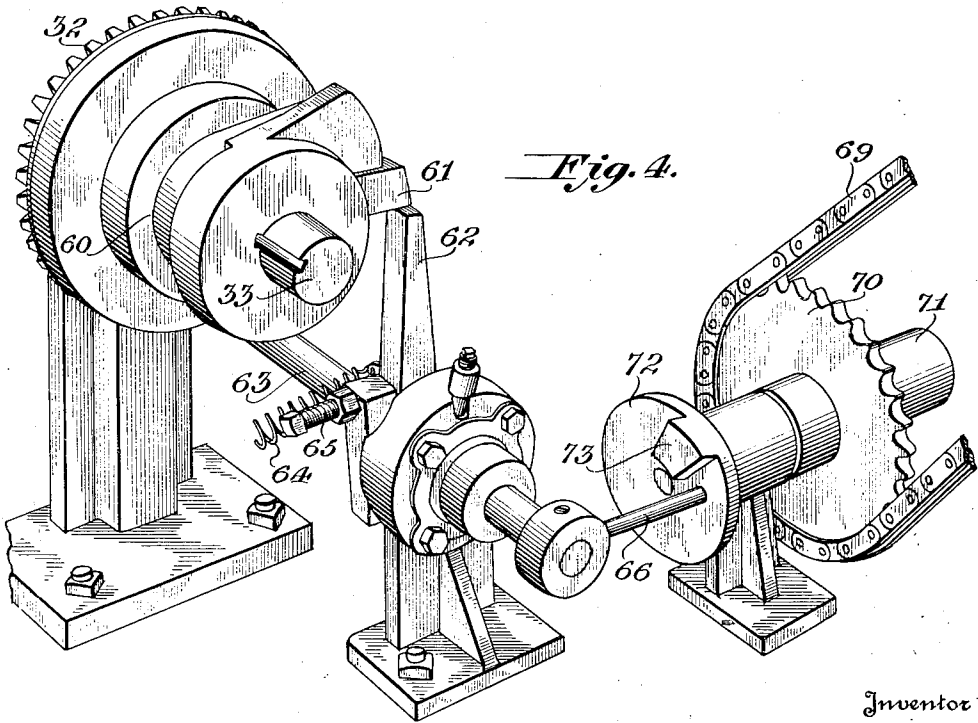


Fig. 4.

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4 Sheets-Sheet 4

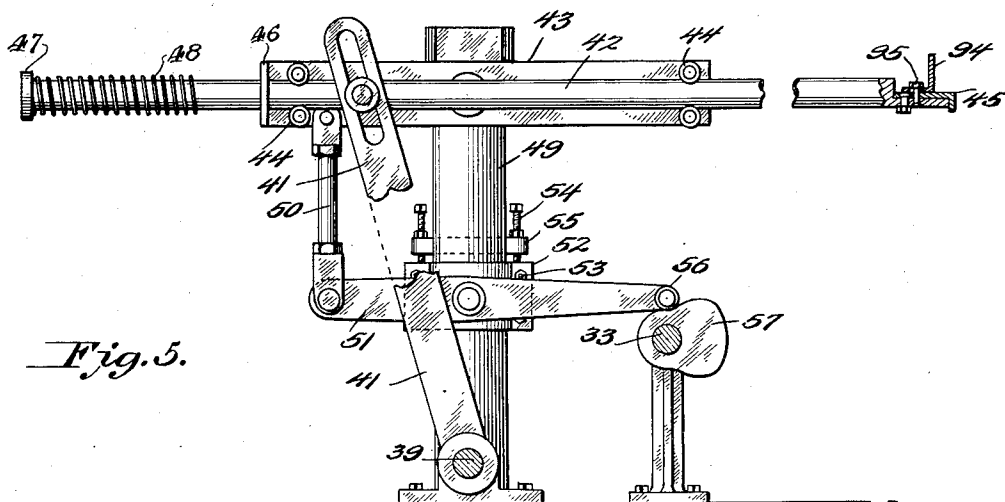


Fig. 5.

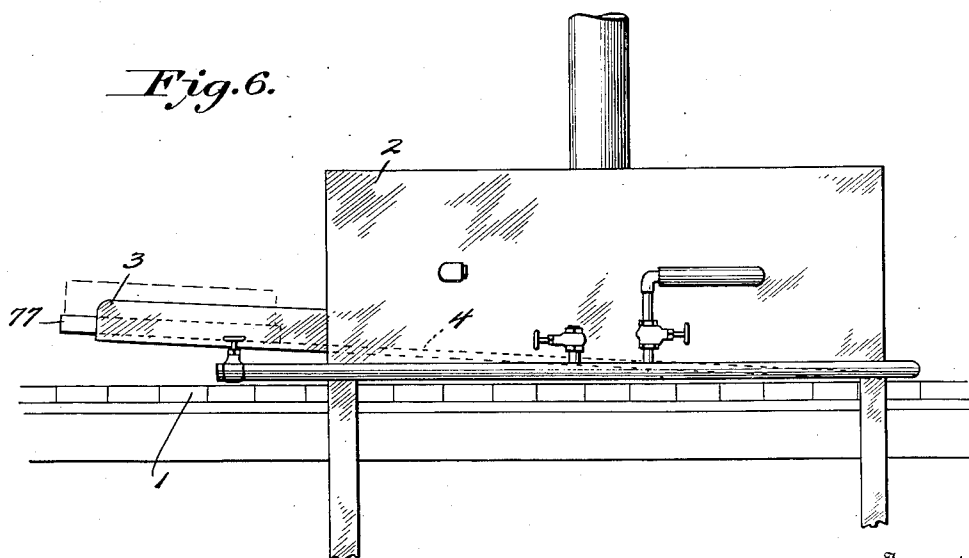


Fig. 6.

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LEER FEEDER

Application filed December 8, 1926. Serial No. 153,393.

The invention relates to an improved and simplified mechanism for automatically feeding to a leer ware to be annealed, and one of the objects of the invention is to provide a simple and efficient construction by which a pusher bar is first moved forwardly to push the ware from a conveyer into the leer, is then slightly withdrawn to free it from contact with the ware, is then swung upward, is then drawn backwardly, and finally is lowered to its original position ready to feed the next quota of ware into the leer.

A further object of the invention is to provide a mechanism of this character which is periodically actuated in accordance with movements of the conveyer carrying the ware, and entirely independent of the number or arrangement of the articles on the conveyer.

Another object of the invention is to provide a leer feeder, the operation of which may be controlled by the number of pans of ware on the conveyer.

A still further object of the invention is to provide a leer feeder, the operation of which may be controlled either by the movement of the conveyer arranged transversely of the leer front, or by the number of pans of ware on the conveyer; that is, a feeder which is adapted to feed to a leer ware carried directly by the conveyer, or ware carried in pans on the conveyer.

Another object of the invention is to provide interchangeable guide means which may be employed for guiding either individual articles or pans of articles, onto the transverse conveyer.

A further object of the invention is to provide an improved pusher bar which is suitable for pushing glass articles of various shapes, either with or without an overhang.

It is unnecessary to mention the numerous further objects and advantages of the invention, which will be apparent to those skilled in the art, from the following de-

tailed description when taken in connection with the accompanying drawings; in which

Figure 1 is a perspective view of the leer feeder; the pusher bar having been moved into the leer and elevated preparatory to being withdrawn; and the front of the leer being omitted for the sake of clearness.

Figure 2 is a plan view of the leer feeder and associated parts of the feeding system; the pusher bar being shown in its withdrawn and lowered position.

Figure 3 is a detail perspective view of the turntable and the tripper mechanism which is adapted to be operated by pans on the cross conveyer.

Figure 4 is a detail perspective view of the tripper mechanism which is employed when the articles are mounted directly on the conveyer.

Figure 5 is a vertical transverse sectional view of the feeder, and showing a modified form of the pusher bar.

Figure 6 is a side view of the oven for warming the pans, and showing its relation to the conveyer which carries the ware from the forming machine to the cross conveyer; and

Figure 7 is a detail perspective view of an interchangeable guide construction.

Referring to the drawings more in detail, numeral 1 indicates generally a continuously moving conveyer for transporting the ware from the forming machine to a point adjacent the leer. The ware is taken from the forming machine, either by hand or mechanically, and placed directly on the conveyer. In some types of ware it is advisable to place the articles in pans prior to feeding them to the leer. For this purpose I have provided, intermediate the ends of the conveyer 1, an oven 2 in which the pans are heated to a proper temperature to receive the glassware. It is an old and well known practice to provide an oven to heat the pans prior

to filling them, but in accordance with the present construction the oven 2 is mounted directly over the conveyer 1, so that the heated pans may be filled directly from the articles on the conveyer, and the pans can then be pushed onto the conveyer to be carried thereby to the leer. The oven is provided with the usual racks to hold the pans while they are being heated, and the end of the oven toward the forming machine is provided with arms 3 to support a pan while it is being filled, and slides 4 are inclined downwardly toward the opposite end of the oven, so that when a pan has been filled it is merely given a push and slides down the inclined elements 4 and onto the conveyer 1. If pans are not being employed, then the articles will simply pass under the oven and continue their travel toward the leer.

The conveyer 1 carries the articles, whether in pans or directly on the conveyer, to a point adjacent the leer 5, where they are transferred by suitable guides, to be described hereinafter, to a turntable 6. From the turntable the individual articles, or the pans containing the articles, are guided onto the cross conveyer 7 which extends transversely of the leer and which is arranged directly in front thereof. As will appear hereinafter the turntable 6, conveyer 7 and the leer feeder, are all operatively connected and driven from a common source of power, while the conveyer 1 is entirely separate from this group and has separate driving means.

The mechanism for operating the conveyer 7 and turntable 6, will now be described.

The motor for driving the apparatus is indicated by numeral 8, and the motor shaft carries a small gear 9 which meshes with the larger gear 10 keyed to a shaft 11 having a worm (not shown) on its opposite end. This worm drives a worm wheel (not shown) keyed to a shaft 14 and preferably mounted in a protective casing 15.

Mounted on one end of the shaft 14 is a sprocket wheel 16, and a chain 17 leads from this sprocket wheel to a sprocket wheel 18 keyed to a shaft 19, which is the driving shaft for the cross conveyer 7, and which continuously drives the conveyer in the usual manner.

The driven shaft at the opposite end of the cross conveyer 7 is indicated by numeral 20, and this shaft has keyed thereto a sprocket wheel 21. A chain 22 leads from sprocket wheel 21 to sprocket wheel 23 keyed to a shaft 24 suitably mounted below the turntable 6. A bevel gear 25 is keyed to the opposite end of shaft 24 and meshes with a bevel gear 26 keyed to the vertical shaft 27 which supports and rotates the turntable. For the purpose of vertically adjusting the turntable, I have provided the adjusting screw 28 which bears against the lower end of the turntable shaft 27 and which is locked

in adjusted position by means of lock nut 29. The turntable is preferably provided with an asbestos board covering 30.

From the foregoing description it will be apparent that the turntable rotates continuously, that the conveyer 7 travels continuously across the front of the leer, and that these members are driven from a common source of power. The particular driving mechanism I employ has been described in considerable detail, but it will be understood that the invention is in no manner limited to the particular driving mechanism described, for obviously any suitable means may be provided for driving the cross conveyer and turntable.

The construction of the leer feeder, and the mechanism for operating the same will now be described.

Keyed to the opposite end of the worm wheel shaft 14 is a bevel gear 31 which meshes with a bevel gear 32 which is loosely mounted on the main driving shaft 33 of the feeder. It may be mentioned here that a clutch periodically locks the bevel gear to the drive shaft, whereby the shaft is given a complete revolution which causes the feeder mechanism to operate through a complete cycle. After a complete revolution of the drive shaft the clutch is automatically thrown out. A tripper mechanism is provided for the purpose of periodically throwing in the clutch. When the articles to be annealed are carried directly on the conveyer a mechanism is provided to operate the tripper after the cross conveyer has traveled a certain distance; and if the articles are placed in pans then another mechanism controlled by the number of pans, operates the tripper. The clutch, the tripper, and the two distinct means for operating the tripper, will be described after the construction and operation of the feeder has been described.

Keyed to the driving shaft 33 is an eccentric strap 34 provided with the usual eccentric strap 35. Threadedly or otherwise suitably attached to the eccentric strap is a connecting rod 36; the opposite end of the rod being threadedly or otherwise suitably attached to a fork 37. The nuts 36' constitute means for varying the effective length of the connecting rod 36. The fork 37 is pivotally connected to the upper end of an arm 38 carried by a rock shaft 39 suitably mounted in bearings 40.

Fixed to the rock shaft 39 and extending upwardly therefrom are two rocker arms 41, and at their upper ends these rocker arms have pin and slot connections with pusher rods 42. These pusher rods are slidably mounted in oscillatable guide frames 43 by means of two pair of rollers 44. Suitably attached to the forward ends of the pusher rods is a transversely extending pusher bar 45, which is of such length as to extend sub-

stantially the entire width of the leer. Obviously the pusher bar may be of any desired construction, but for the feeding of ordinary ware the pusher bar consists of nothing more than a length of angle iron. For ware of different shapes it is sometimes advisable to employ pusher bars of different construction; as an illustration of this, I have shown in Figure 5, and will describe hereinafter, a form of pusher bar which is particularly adapted for feeding articles having an overhang.

The rear ends of the pusher rods 42 extend through openings provided in the end members 46 of the oscillatable guide frames 43. A collar 47 or other suitable abutment may be provided on the rear ends of the pusher rods, and coil springs 48 may be mounted on the rods between the abutments 47 and the end members 46 of the guide frames. The purpose of these springs is to assist in withdrawing the pusher bar a short distance before it is elevated. However, as will appear hereinafter, the mechanism is designed to accomplish this function without the use of springs, and therefore they do not form any essential part of the construction.

The guide frames 43 are pivotally mounted on standards 49, and pivotally attached to these frames are connecting rods 50; the lower ends of the connecting rods being pivotally attached to the ends of rocker bars 51. The rocker bars 51 are pivotally mounted, intermediate their ends, on collars 52 which are clamped in adjusted position on standards 49 by means of bolts 53; and are held in adjusted position by means of screws 54 which pass downwardly through lugs 55 and bear on the upper face of the collars 52. The element 55 preferably consists merely of a bar which passes through the standard and has both ends projecting therebeyond to receive the screws 54, as indicated in Figure 5.

The ends of the rocker bars toward the leer are provided with rollers 56 which engage and are actuated by cams 57 carried by the main drive shaft 33.

The operation of the mechanism thus far described is as follows:

When the shaft 33 starts to rotate, the eccentric 34 through its connections with the rocker shaft 39 will rock this shaft in the direction to move the rocker arms 41 toward the leer; and the pin and slot connections between these arms and the pusher rods 42 will cause these rods to move forwardly, thereby moving the pusher bar across the cross conveyer 7, and thus pushing into the leer whatever ware may be on the conveyer. Before elevating the pusher bar, it is desirable to withdraw it slightly to free it from the ware, and for this purpose the eccentric 34 and cams 57 are relatively positioned so that the eccentric will start to withdraw the

pusher bar before the cams come into play to lift the bar.

The pusher bar having been moved the full length of its stroke into the leer and having been slightly withdrawn, the continued rotation of the drive shaft 33 brings the cams 57 into play, and the lobe portion of the cams rocks the forward ends of the bars 51 upwardly, thereby rocking the guide frames to lift their forward ends and thus lifting the forward ends of the pusher rod and the pusher bar carried thereby. The pusher bar is thus lifted to such a distance that when it is withdrawn it will pass over the tops of articles which are being carried across the front of the leer on the cross conveyer 7, and it will be noted that the cams 57 are so designed as to maintain the pusher bar in this elevated position for a substantial period of time, so that the bar will be entirely withdrawn before it is lowered.

The cams 57 having elevated the pusher bar so that it will clear the incoming ware, the continued rotation of the drive shaft 33 causes the eccentric to rock the shaft 39 and arms 41 outwardly to their full extent thereby withdrawing the pusher bar its full distance. When the pusher bar has been withdrawn its full extent, it is ready to be lowered, and consequently at this point in the operation the rollers 56 ride down the sides of the cams 57, thereby permitting the pusher bar to be lowered by gravity to its original horizontal position. The shaft 33 has now made a complete rotation and has caused the feeder to perform a complete cycle of operation, and at this point a clutch is automatically thrown out, as will be described hereinafter, thereby stopping the rotation of the shaft and the operation of the feeder, until the clutch is again automatically thrown in to cause the feeder to perform another cycle of operation. It may be mentioned here that I preferably provide brackets 58 carrying rollers 59 at their upper ends, for the purpose of supporting the pusher rods 42 in the event that they should drop because of the breakage of any parts.

I have thus far described the construction and complete operation of the feeder, with the exception of the tripper mechanism by which the feeder is periodically caused to operate, either in accordance with movements of the cross conveyer 7 when the ware is placed directly on the conveyer, or in accordance with the number of pans on the conveyer, when the ware to be annealed is such that it is placed in pans.

Numerals 60 indicates a clutch which is mounted on the main drive shaft 33, and which is adapted to intermittently lock the bevel gear 32 to the shaft 33, to cause a complete revolution thereof. This clutch is provided with a short lever 61 which is adapted to engage a tripper finger 62, and

when it engages this tripper finger the clutch is thrown out, thereby releasing the gear 32 from the shaft 33 and stopping the operation of the feeder. When the tripper finger is

5 moved to release the lever 61, the clutch is thrown in and the shaft 33 again begins its periodical rotation. Figure 4 clearly shows the position of the parts when the clutch 60 is out and the drive shaft is not rotating.

10 The tripper finger 62 is fixed to a rockable tripper shaft 63, and this shaft and tripper finger are normally held in position to engage the clutch lever 61 by means of a spring 64. The movement of the finger 62 in this direction is adjustably limited by means of an

15 adjustable stop 65. To rock the tripper shaft 63 in the direction to release the tripper 62 from the clutch lever 61, I provide one end of the shaft 63 with a short laterally extending arm 66, and I provide the opposite end of the shaft with a similar arm 66'. The arm 66 is operated in accordance with movements of

20 the cross conveyer 7, and the arm 66' is operated in accordance with the number of pans on the cross conveyer, and it is obvious that if either arm is moved downwardly it will rock the shaft 63 thereby tripping finger 62 and throwing in the clutch 60. I shall first describe the mechanism for operating the arm

25 66.

A sprocket wheel 67 is loosely mounted on the conveyer shaft 19, and a clutch 68 normally locks this sprocket wheel to the continuously rotating shaft. A sprocket chain 35 69 leads from sprocket wheel 67 to a sprocket wheel 70 fixed to a shaft 71. The shaft 71 is thus continuously rotated, and this shaft carries a disc 72 provided with a lug 73, which will come into engagement with the arm 66

40 at the proper time, thereby rocking the tripper shaft 63 and releasing the tripper finger 62 from the clutch lever 61. The machine is thus thrown into operation, and when the lug 73 frees the arm 66 the spring 64 will bring

45 the tripper finger 62 back into position to again engage the clutch lever 61, when the driving shaft 33 and clutch 60 have made a complete rotation. The ratio of the various sprockets will, of course, vary with different

50 installations; but it will be such that the shaft 71 will make a complete revolution while the cross conveyer 7 is traveling substantially the width of the leer; so that every time the conveyer 7 travels substantially the width of the

55 leer the lug 73 will actuate the tripper to throw the feeder in gear, which will then function, in the manner hereinbefore described, to push the ware from the cross conveyer into the leer.

60 Let it be assumed now that the ware is being fed to the leer in pans, and that the feeder is to be operated in accordance with the number of pans on the cross conveyer. To operate the machine in this manner, I first

65 render inoperative the above described trip-

ping mechanism by throwing out the clutch 68 by means of a handle 74, so that this tripper mechanism remains inactive.

Reference is now to be had to the tripper mechanism shown at the left of Figures 2 and 3. The rod 66' is moved downwardly in just the same manner as in the previously described mechanism, that is, a disc 75 carries a lug 76, which at intervals engages and depresses the arm 66 thereby releasing the tripper finger 62 from the clutch lever 61; but in this case the disc 75 is intermittently rotated step by step as the pans 77 are fed onto the cross conveyer.

The disc 75 is fixed to a shaft 78 which carries at its opposite end a sprocket wheel 79. A sprocket chain 80 leads from sprocket wheel 79 to a sprocket wheel 81 carried by the shaft 82. A ratchet wheel 83 is connected with the sprocket wheel 81; and a pawl 84 is carried by the lever 85 and adapted to intermittently engage and rotate the ratchet wheel and sprocket step by step. The lever 85 is, of course, loosely mounted on the shaft 82.

In operation, as a pan of ware passes from the turntable 6 onto the cross conveyer 7 it will engage the lever 85 and move it to the right (Figures 2 and 3). This movement of the lever 85 will move the ratchet wheel 83 and sprocket 81 one step, and through the medium of chain 80 the disc 75 will be moved one step. After the pan passes clear of the lever 85 the counterweight 86 throws the lever upward into position to be engaged by the next pan.

In the same manner each succeeding pan moves the ratchet wheel one step, and when the desired number of pans have passed onto the conveyer 7, the lug 76 is brought into position to engage and depress the arm 66', thereby tripping the finger 62, and throwing the machine into operation for one complete cycle, to push the pans from the conveyer into the leer, in the manner hereinbefore described. Of course, the ratchet wheel and sprockets will be such that the lever 85 may be operated any desired number of times before the tripper is operated to start the feeder.

I have now described the complete construction and operation of the leer feeder, and all that remains to be described are the interchangeable guides for either individual articles or leer pans.

For guiding the leer pans, I provide a curved plate 87 which extends diagonally across the conveyer 1, and which will guide the pans from this conveyer onto the turntable 6. Extending across the turntable I provide a similar curved arm 88, for guiding the pans from the turntable onto the cross conveyer 7. When it is desired to feed the articles directly on the conveyer, I provide guide rods 89, 89' which are preferably made of soft metal which may be easily bent to any desired shape. These guide rods may be ad-

justably attached to the guide bars 87, 88 in any desired manner, but in the preferred construction I merely extend the ends of the rods through holes in the bars, and provide nuts 90 for locking the rods in adjusted position. The construction is clearly shown in Figures 2 and 7. For the purpose of steadying the articles I provide a bracket 91, which is preferably slotted to adjustably receive a rod 92 which carries at its lower end a guide member 93. These guides for the individual articles may be quickly and easily removed when it is desired to feed the ware in pans. A burner 93' is arranged below the turntable 6 for the purpose of heating it.

In Figure 5 I have shown a slightly modified form of pusher bar which is particularly for use in the feeding of articles having an overhang. For this purpose an upstanding plate 94 is mounted on top of the pusher bar 45, and it will be noted that the upstanding plate is spaced slightly to the rear of the face of the pusher bar 45. By means of this construction, the pusher bar 45 will come into contact with the lower portion of the articles, and the upstanding plate 94 will come into contact with the overhang, thereby steadying the articles to keep them from being overturned. The plate 94 is preferably adjustably attached to the pusher bar 45 by means of slots (not shown) and bolts 95.

The construction described herein is, of course, subject to many changes and modifications, all of which are intended to be included in the appended claims.

What I claim is:

1. A leer feeder including a pusher bar, means for moving the bar into and out of the leer, means for raising and lowering the bar, the two means being so related that the bar is moved backward slightly before being elevated, and a spring for assisting the slight backward movement.

2. A leer feeder including a conveyor extending across the leer, a pivotally mounted frame, a rod slidably mounted in said frame, a pusher bar carried by said rod and adapted to push ware from the conveyor, a rotatable shaft, means operated by said shaft for reciprocating said rod, means operated by said shaft for oscillating said frame about its pivot, a clutch associated with said shaft, and two tripper mechanisms, either of which is adapted to operate said clutch, one of said tripper mechanisms being operated in accordance with the movement of the conveyor, and the other tripper mechanism being operated in accordance with the number of pans on the conveyor.

3. A leer feeder including a standard, a frame pivotally mounted on said standard, a rod slidably mounted in said frame, a pusher bar carried by said rod, means for reciprocating said rod, an arm pivotally mounted on said standard, a link connecting said arm and

said frame, and a cam for oscillating said arm.

4. A leer feeder including a standard, a frame pivotally mounted on said standard, a rod slidably mounted in said frame, a pusher bar carried by said rod, means for reciprocating said rod, an arm pivotally mounted on said standard, a link connecting said arm and said frame, a cam for oscillating said arm, and means for vertically adjusting the pivotal mounting of said arm.

5. A leer feeder including a standard, a frame pivotally mounted on said standard, means for oscillating said frame about its pivot, a rod slidably mounted in said frame, a pusher bar carried by said rod, a rock shaft, an upwardly extending arm carried by said rock shaft and operatively connected with said rod.

6. A leer feeder including a standard, a frame pivotally mounted on said standard, means for oscillating said frame about its pivot, a rod slidably mounted in said frame, a pusher bar carried by said rod, a rock shaft, an upwardly extending arm carried by said rock shaft and operatively connected with said rod, a drive shaft, and an eccentric carried by said drive shaft and operatively connected with said rock shaft.

7. A leer feeder including a conveyor extending across the leer, a pusher bar to push articles from the conveyor, means for reciprocating said pusher bar, and tripper mechanisms controlling the operations of said means, said tripper mechanisms being selectively operated either by the movement of the conveyor or by pans on a conveyor.

8. A leer feeder including a conveyor extending across the leer, a pusher bar to push articles from the conveyor, means for raising and lowering said pusher bar, and tripper mechanisms controlling the operation of said means, said tripper mechanisms being selectively operated either by the movement of the conveyor or by pans on a conveyor.

9. A leer feeder including a conveyor extending across the leer, a pusher bar to push articles from the conveyor, means for reciprocating said bar, means for raising and lowering said bar, tripper mechanisms controlling the operation of said means, said tripper mechanisms being selectively operated either by the movement of the conveyor or by pans on the conveyor.

10. A leer feeder including a conveyor extending across the leer, a pusher bar to push articles from the conveyor, a driving shaft for operating said pusher bar, a clutch associated with said shaft, two tripper mechanisms selectively controlling said clutch, one of said tripper mechanisms being operative when the ware is placed directly on the conveyor, and the other of said tripper mechanisms being operative when the ware is placed in pans on the conveyor.

11. A leer feeder including a conveyer extending across the leer, a pusher bar for feeding ware from the conveyer to the leer, means for operating said pusher bar, two
 5 tripper mechanisms controlling the operation of said means, one of said tripper mechanisms being controlled by the movement of said conveyer, and the other of said tripper mechanisms being controlled by pans
 10 on said conveyer.
12. A leer feeder including a conveyer extending across the leer, a pusher bar for feeding ware from the conveyer to the leer, means for moving the pusher bar into and
 15 out of the leer and for raising and lowering the pusher bar, a rotatable shaft for operating said means, and tripper mechanisms for controlling the rotation of said shaft, one of said tripper mechanisms being operative
 20 when the ware is placed directly on said conveyer, and the other of said tripper mechanisms being operative when the ware is placed in pans on said conveyer.
13. A leer feeder including a conveyer extending across the leer, a pusher bar for feeding ware from the conveyer to the leer, means for operating the pusher bar, a tripper
 25 mechanism for controlling the operation of said means in accordance with the movement of said conveyer, and a second tripper mechanism controlled by pans on said conveyer.
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14. A leer feeder including a conveyer extending across the leer, a pusher bar, means
 35 for operating the pusher bar, a tripper shaft for controlling the operation of the pusher bar, two laterally extending arms carried by the tripper shaft, means controlled by the movement of said conveyor for engaging
 40 and operating one of said arms, and means controlled by pans on said conveyor for engaging and operating the other of said arms.
15. A leer feeder including a conveyer extending across the leer, a pusher bar, means
 45 for operating the pusher bar, a tripper shaft for controlling the operation of the pusher bar, two laterally extending arms carried by the tripper shaft, means controlled by the movement of said conveyor for engaging and
 50 operating one of said arms, a clutch for rendering said means inoperative, and means controlled by pans on said conveyor for engaging and operating the other of said arms.
16. A leer feeder including a reciprocable
 55 pusher rod, a pusher bar carried by said rod, an upstanding plate mounted on said pusher bar and spaced to the rear of the front edge of said bar, and means for adjusting said plate toward or from the front edge of said
 60 bar.
17. A leer feeder including a conveyer extending across the leer, a pusher bar adapted to push articles or pans containing articles from said conveyer into the leer, guide bars
 65 for guiding pans onto said conveyer, and guides for individual articles removably attached to said pan guides.
18. A leer feeder including a conveyer extending across the leer, a pusher bar adapted to push articles or pans containing articles from said conveyer into the leer, guide bars
 70 for guiding pans onto said conveyer, and guides for individual articles adjustably mounted on said pan guides.
- HARRY L. WITTMAN. 75
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