

May 14, 1935.

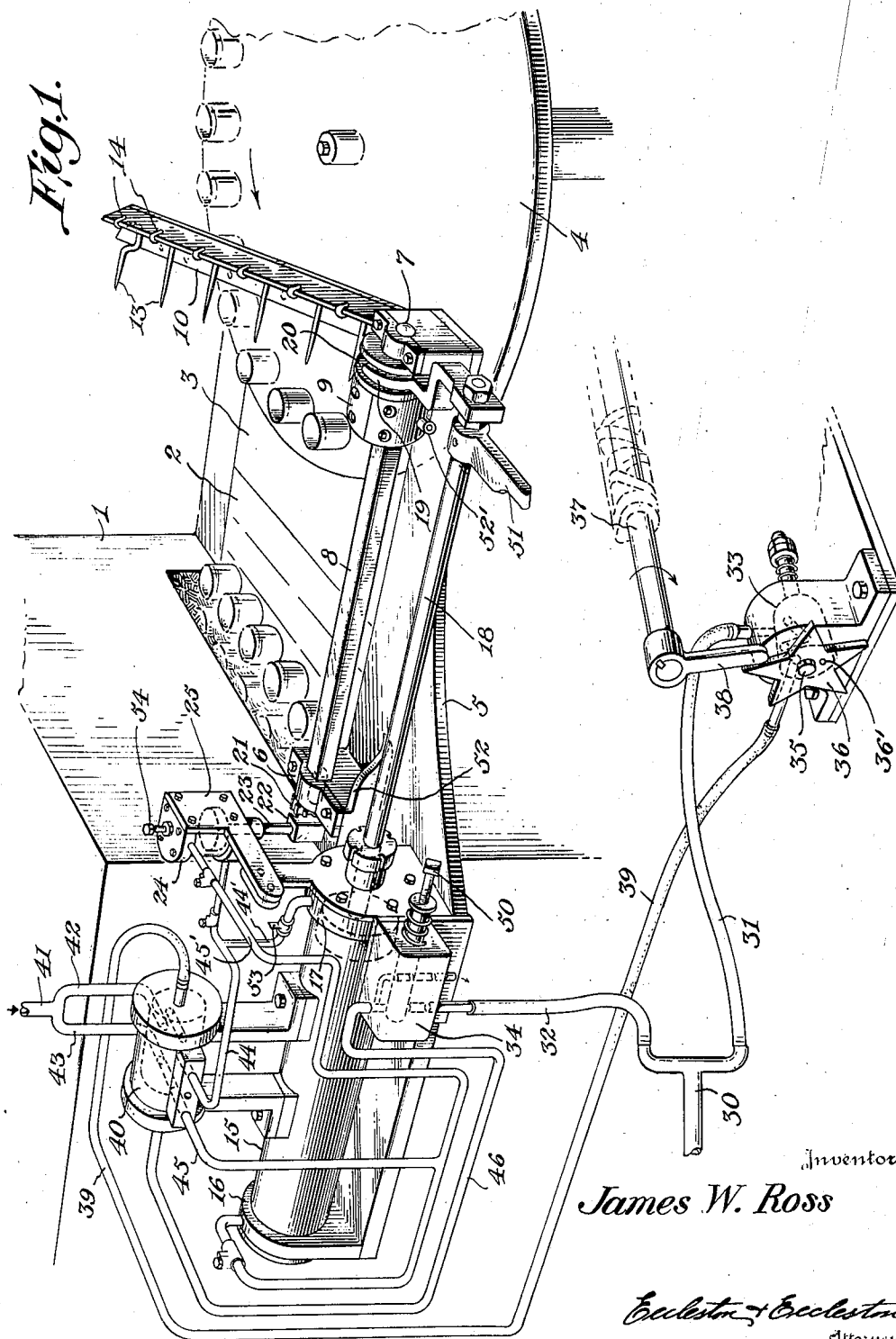
J. W. ROSS

2,001,332

LEER LOADER

Filed May 31, 1933

2 Sheets-Sheet 1



May 14, 1935.

J. W. ROSS

2,001,332

LEER LOADER

Filed May 31, 1933

2 Sheets-Sheet 2

Fig. 2.

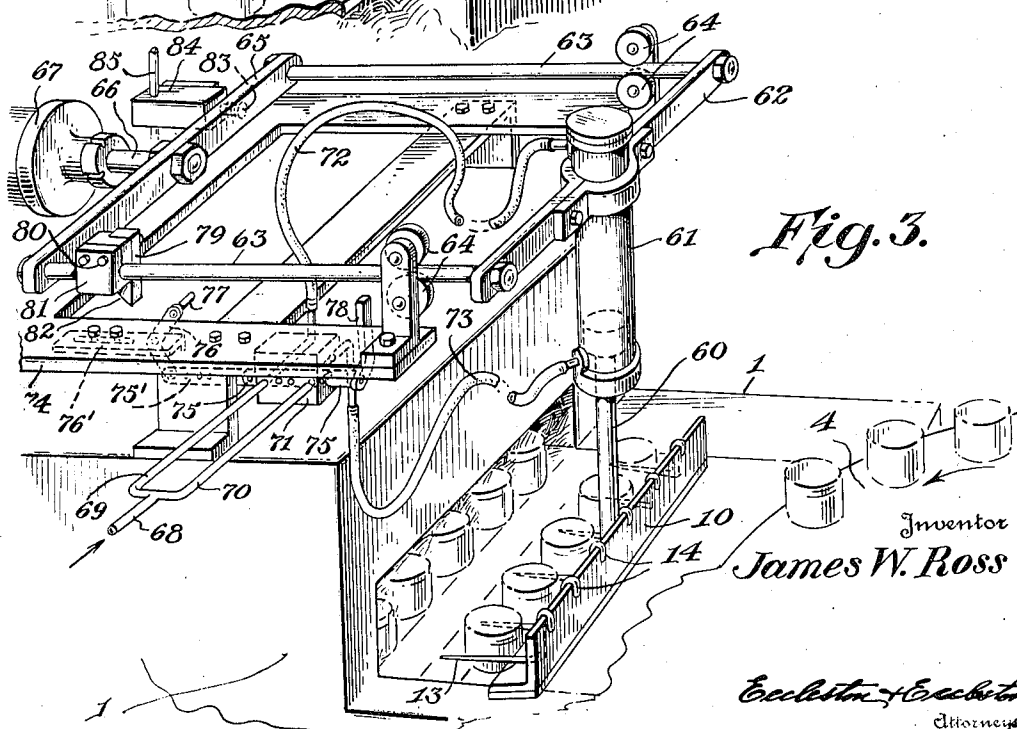
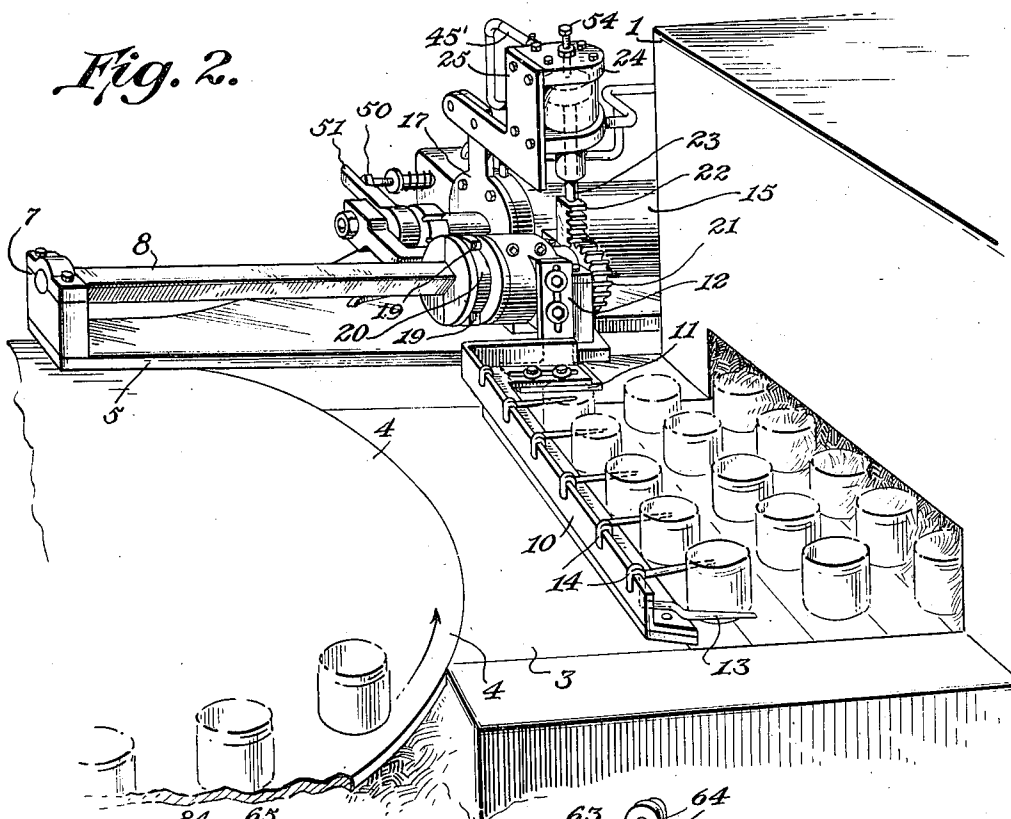


Fig. 3.

Inventor
James W. Ross

Exelstein & Exelstein
Attorneys

UNITED STATES PATENT OFFICE

2,001,332

LEER LOADER

James W. Ross, Washington, Pa., assignor to
Hazel-Atlas Glass Company, Wheeling, W. Va.,
a corporation of West Virginia

Application May 31, 1933, Serial No. 673,725

11 Claims. (Cl. 198—31)

The invention relates to leer loaders for feeding ware into an annealing leer, and one of the objects of the invention is to provide a mechanism which is very simple in construction and operation.

Another object of the invention is to provide a leer loader which automatically operates after a predetermined number of pieces of ware have been formed on the forming machine.

A further object of the invention is to provide an extremely simple and inexpensive device by which it is possible to quickly change the operation of the leer loader from a particular number of articles formed on the forming machine to any other desired predetermined number of articles formed on the forming machine.

Numerous other objects and advantages of the invention will be apparent to those skilled in the art, from the following detailed description when taken in connection with the accompanying drawings; in which,

Figure 1 is a perspective view of the apparatus installed on the side of a leer.

Figure 2 is a similar view taken from a different angle and showing the completion of an operative stroke of the pusher bar, and

Figure 3 is a perspective view of a modified form of leer loader particularly adapted for mounting on the top of the leer.

Referring to the drawings in more detail, and especially to Figures 1 and 2, the numeral 1 indicates the forward portion of an annealing leer for glassware provided with any conventional type of leer conveyer 2, and the usual shadow pan 3. A rotating table 4 is provided for conveying the ware from the forming machine across the mouth of the leer although it is to be understood that a cross-conveyer or other desired means may be provided for the purpose of carrying the ware across the mouth of the leer.

Mounted on the side of the leer and extending forwardly thereof is a base plate or shelf 5 on which the leer loader is supported. Bearings 6 and 7 are spaced longitudinally of the shelf and support a guide rod 8 which is preferably of rectangular cross-section. A head 9 provided with a longitudinal opening having a shape corresponding to the cross sectional shape of the rod 8 is slidably mounted on the rod. The pusher bar, which is indicated by the numeral 10, is mounted for horizontal adjustment on a plate 11 which is provided with a vertical extension 12. The extension plate 12 is vertically adjustable on the head 9, and thus combines with the horizontal adjustment to permit the pusher

bar to be accurately adjusted to the desired position.

Fingers 13 are adjustably mounted along the length of the pusher bar 10 by means of hook-shaped portions 14. These elements provide convenient means for properly spacing the units of the line of ware as they are being pushed onto the leer conveyer.

The pusher bar is reciprocated back and forth toward and from the leer by a compressed air system including a cylinder 15 mounted in spaced brackets 16 and 17 on the shelf 5. The free end of the piston rod 18 of cylinder 15 carries a forked member 19 which engages in an annular groove 20 in the head 9 to which the pusher bar 10 is attached. The reciprocating movement of the piston rod 18 will therefore be transmitted through yoke 19 to the head 9 and cause it and the pusher bar 10 to be reciprocated back and forth along the guide rod 8.

After the pusher bar has been moved toward the leer to carry in a line of ware, it is essential that the bar be raised above the table 4 or other conveying means before it can be returned to its initial position. Otherwise it would interfere with the oncoming ware which is being brought by the table into register with the mouth of the leer. It is for this reason that the guide rod 8 is oscillatably mounted in the bearings 6—7 and the head 9 is caused to move with the rod. A pinion 21 is fixed to the inner end of rod 8 and meshes with a vertically disposed rack 22 carried by a piston rod 23. This piston rod is operated by a cylinder 24 mounted on a plate 25. Compressed air is alternately admitted to the upper and lower ends of the cylinder 24 and to the forward and rear ends of cylinder 15 in a manner which will now be described.

Air under pressure is conveyed from a source of supply (not shown) by pipe 30 to branches 31 and 32 leading to a starting valve and a reversing trip valve 33 and 34 respectively. The valve 33 is of the rotary type and is provided with a shaft to which the valve body is fixed. Secured to one end of the shaft is a star wheel 36 shown as provided with five points. This wheel is secured on the shaft by any desired means as by a bolt 35, so that the star wheel may be readily removed to permit the substitution of another star wheel having a greater or lesser number of points or arms. The star wheel always assumes the same position with respect to the valve body by reason of a pin 36' carried by the valve body and extending into an opening provided in the star wheels. The numeral 37 indicates the usual

cam timing shaft of a forming machine for the manufacture of glassware. I have provided this shaft with an arm 38 adapted to engage and move the star wheel a distance equal to the spacing of adjacent points upon each rotation of the shaft 37. A complete rotation of the star wheel, and hence a complete rotation of the valve body 33, will cause the ports in the valve body to align with pipe 31 and with a pipe 39 leading to a reversing valve 40 which controls the operation of the pusher bar 10. It will be apparent therefore that in the installation shown the pusher bar will be caused to operate after the shaft 37 has made five rotations, i. e., after five pieces of ware have been formed on the forming machine. If it is desired that the pusher bar operate with greater or less frequency with respect to the operations of the forming machine it is only necessary to remove the star wheel shown and substitute one having the appropriate number of points. For instance, if it is desired that the pusher bar operate after four or six pieces of ware are formed then a star wheel having either four or six points would be substituted.

A pipe 41 leads from the source of air supply to branch pipes 42 and 43 which are connected to the casing of the reversing valve 40, while pipes 44 and 45 lead from the casing to the lower end of cylinder 24 and the rear end of cylinder 15. Pipe 45 has a branch 45' leading to the upper end of cylinder 24, and pipe 44 has a branch 44' leading to the forward end of cylinder 15. The pipe 39, heretofore referred to, connects with the forward end of casing 40 to admit pressure fluid to this end of the casing, and a pipe 46 connected with reversing trip valve 34 leads to the opposite end of the casing. The valve body in casing 40 is reciprocally mounted and, as indicated in dotted lines, is provided with two parallel passages spaced apart a greater distance than the space between the ports for pipes 42-43 and 44-45. Movement of the valve body to the forward end of its casing 40 will cause one passage to communicate with pipes 42-44, and movement to the opposite end will cause the other passage to communicate with pipes 43-45.

The reversing trip valve 34 is provided with a spring-pressed stem 50 and the piston rod 18 of cylinder 15 carries a fixed dog 51 which is adapted to engage the stem and operate the valve so as to allow fluid pressure to flow from pipe 32 to pipe 46 and thence to the rear end of reversing valve 40. This passage of pressure fluid to valve 40 shifts communication between pipes 42 and 44 to communication between pipes 43 and 45 and thus causes the piston of cylinder 15 to move forwardly and return the pusher bar to its initial position preparatory to conveying another line of ware into the leer.

The reversal of valve 40 also causes pressure fluid to enter the upper end of cylinder 24 through pipe 45'. Action of the piston of this cylinder is delayed however by reason of the fact that a roller 52' on head 9 is in engagement with a cam 52 on the plate 5. The engagement of the cam and roller prevents the shaft 8 from being rotated until such time as the cylinder 15 has moved the pusher bar away from the leer a distance substantially equal to the length of the highest part of the cam. When this movement occurs the piston rod 23 will move the rack 22 downwardly and rotate pinion 21 so as to lift the pusher bar to some such position as shown in Figure 1.

The pusher bar after reaching its outermost

position remains at rest until the star wheel has made a complete rotation by successive engagements with the arm 38; after which pressure fluid is allowed to pass through pipe 39 to reverse the valve 40 and admit air to its forward end. The reversal of the valve admits air to the forward end of cylinder 15 to start the operative stroke of the pusher bar, and it is to be noted that a control valve 53 is provided in the line 44' to regulate the speed of the inward stroke of the bar. This reversal of valve 40 also admits motive fluid to the lower end of cylinder 24 to raise the rack bar 22 and lower the pusher bar to horizontal position; and a screw 54 in the upper end of the cylinder provides means for adjusting the extent of downward movement of the bar 10. The forward movement of the lowered pusher bar moves the line of ware into the leer and the operations heretofore referred to are repeated.

The modified construction shown in Figure 4 is substantially the same in operation as that described above, but is modified somewhat by reason of the fact that the apparatus is mounted on the top of the leer to conserve space. In this form of the invention the pusher bar 10 with its adjustable spacing fingers 13 is mounted on a piston rod 60 which is associated with a vertically disposed cylinder 61. This cylinder is mounted in a carrier including a yoke 62 secured to parallel rods 63 slidably mounted between pairs of rollers 64.

The rear ends of rods 63 are connected by a rear yoke 65 which is in turn connected to the piston rod 66 of a cylinder 67 mounted on top of the leer. It will be understood that the cylinder 61 raises and lowers the pusher bar 10, and that the cylinder 67 reciprocates the pusher bar back and forth with respect to the mouth of the leer.

The fluid pressure system for the cylinders 61 and 67 includes a main air pressure line 68 leading from a source (not shown) and provided with branch lines 69 and 70 leading to a control valve 71 for the cylinder 61. Flexible connections 72 and 73 lead from valve 71 to the top and bottom of cylinder 61, and the valve is operated through reciprocation of the carrier 62-65 as will now be described.

The reversing valve 71 is suspended beneath a base plate 74 on which the carrier 62-65 is mounted, and is provided with an operating rod 75 which extends outwardly beyond the valve casing at each end thereof. A bell-crank lever 76 is pivoted to a plate 76' which is adjustably mounted on the under side of base plate 74, and this bell-crank has one end pivoted to a link 75' of operating rod 75. The opposite end of lever 76 is provided with a pin 77. The forward end of rod 75 is provided with an upright lug 78, and both the pin 77 and lug 78 are in the path of travel of a dog 79 which is pivoted as indicated at 80 to a block 81 fixed to rod 63 of the carrier. The dog 79 is provided with a bevel 82 on its rear face to cause it to ride over the pin 77 when moving to the left (Figure 3).

Assuming a line of ware to have been moved into the leer, the pusher bar begins its return movement, but is not lifted until the fingers clear the ware. This occurs at the time the dog 79 engages the pin 77 and moves rod 75 to the left to reverse the valve. Air under pressure is now admitted to the lower end of the cylinder 61 to raise the pusher bar to clear oncoming ware carried by the table 4. As the pusher bar reaches its outermost position the dog 79 engages lug 78 on the opposite end of operating rod 75 and moves

the same to the right so as to again reverse valve 71 and lower the pusher bar to its initial position. The adjustment of the plate 76' provides for varying the position of the pin 77 longitudinally of the carrier and thus provides a means for varying the time in the cycle of operations at which the pusher bar is raised after conveying a line of ware into the leer.

When the carrier 62-65 makes its return or inward stroke the pivoted dog rides over the pin 77 which is then in its raised position, and the pusher bar remains down until the dog again engages the pin on the outward stroke of the carrier.

As the carrier approaches the limit of its inward stroke it engages a spring pressed plunger 83 which is connected to the valve body in reversing trip valve casing 84 and allows motive fluid to pass through pipe 85 to the reversing valve so as to reverse the movement of the carrier. The construction and operation of the reversing valve, the starting valve, the star wheel for operating the same, etc., have all been described in connection with the description of the apparatus disclosed in Figures 1 and 2 and inasmuch as the use of such devices is identical in the disclosure of Figure 3 it is not deemed necessary to show them in this figure or to again describe them.

From the foregoing description and the accompanying drawings it will be apparent to those skilled in the art that I have devised a leer loader of relatively few working parts; that it can be installed on a leer so as to occupy a minimum of space; that simplified means is provided for controlling the operation of the pusher bar in accordance with a predetermined number of operations of the forming machine; that the time of such operation may be varied as desired by the mere substitution of a control wheel having the desired number of teeth; and that the pusher bar is so constructed as to properly space the ware while being moved onto the conveyor.

While the construction has been described in considerable detail yet it will be understood that many changes and modifications may be made without departing from the spirit of the invention, and all such changes and modifications are intended to be included within the scope of the appended claims.

What I claim is:

1. A leer loader including a pusher bar extending across the face of the leer when in operative position, said bar being pivotally mounted at one end at one side of the leer, means for moving the bar toward and from the front of the leer, and means for swinging the free end of the bar up and down across the front of the leer in substantially vertical planes parallel with the front of the leer.

2. A leer loader including a guide rod mounted adjacent the mouth of a leer and extending parallel to the longitudinal axis of the leer, a pusher bar extending across the face of the leer and having one end slidably mounted on the rod, means for reciprocating the pusher bar, and means for raising and lowering the end of the bar remote from the guide rod.

3. A leer loader including a guide rod of angular cross section mounted adjacent the mouth of a leer and extending parallel to the longitudinal

axis of the leer, a pusher bar provided with a head slidably mounted on the rod, means for moving the pusher bar and head back and forth along the rod, and means for oscillating the rod.

4. A leer loader including a guide rod of angular cross section mounted adjacent the mouth of a leer and extending parallel to the longitudinal axis of the leer, a pusher bar provided with a head slidably mounted on the rod, a pinion on one end of the rod, a rack meshing with the pinion for oscillating the same, and means for moving the pusher bar and head back and forth along the rod.

5. A leer loader including a pusher bar mounted to swing in a vertical plane, means for moving the pusher bar toward and from a leer, means for raising and lowering the bar about its pivot, and a cam for preventing the bar being raised until it has been moved a short distance away from the leer on its return stroke.

6. A leer loader including an oscillatably-mounted guide rod, a pusher bar provided with a head slidably mounted on the guide rod, means for reciprocating the pusher bar and head, and means for oscillating the guide rod.

7. A leer loader including an oscillatably-mounted guide rod, a pusher bar slidably connected to the rod, a fluid pressure system for reciprocating the pusher bar and for oscillating the guide rod, and cooperating means on the pusher bar and leer to prevent oscillation of the rod in one direction until the pusher bar has been moved a short distance away from the leer.

8. A leer loader including an oscillatably-mounted guide rod, a pusher bar slidably connected to the rod, a fluid pressure system for reciprocating the pusher bar and for oscillating the guide rod, and a cooperating cam and roller on the leer and pusher bar to prevent oscillation of the rod while the bar is at its innermost position.

9. In a leer loader, the combination of a reciprocably mounted pusher bar, pneumatic means for operating the pusher bar, a timing device for controlling the operations of the pusher bar, said timing device including a rotary valve controlling said pneumatic means, a star wheel rotated step-by-step from the timing shaft of a forming machine and operatively connected with said star wheel.

10. In a leer loader the combination of a reciprocably mounted pusher bar, pneumatic means for operating the pusher bar, a timing device for controlling the operations of the pusher bar, said timing device including a rotary valve, a shaft for rotating the valve, a member removably secured to the shaft and to which a step-by-step movement is imparted by the timing shaft of a forming machine.

11. In a leer loader the combination of a reciprocably mounted pusher bar, pneumatic means for operating the pusher bar, a timing device for controlling the operations of the pusher bar, said timing device including a rotary valve, a shaft for rotating the valve, a star wheel removably secured to the shaft, and an arm fixed to the timing shaft of a forming machine for imparting a step-by-step movement to the star wheel.

JAMES W. ROSS. 70