Dec. 28, 1926. 1,612,366

J. J. FAHRNEY

CIDER PRESS

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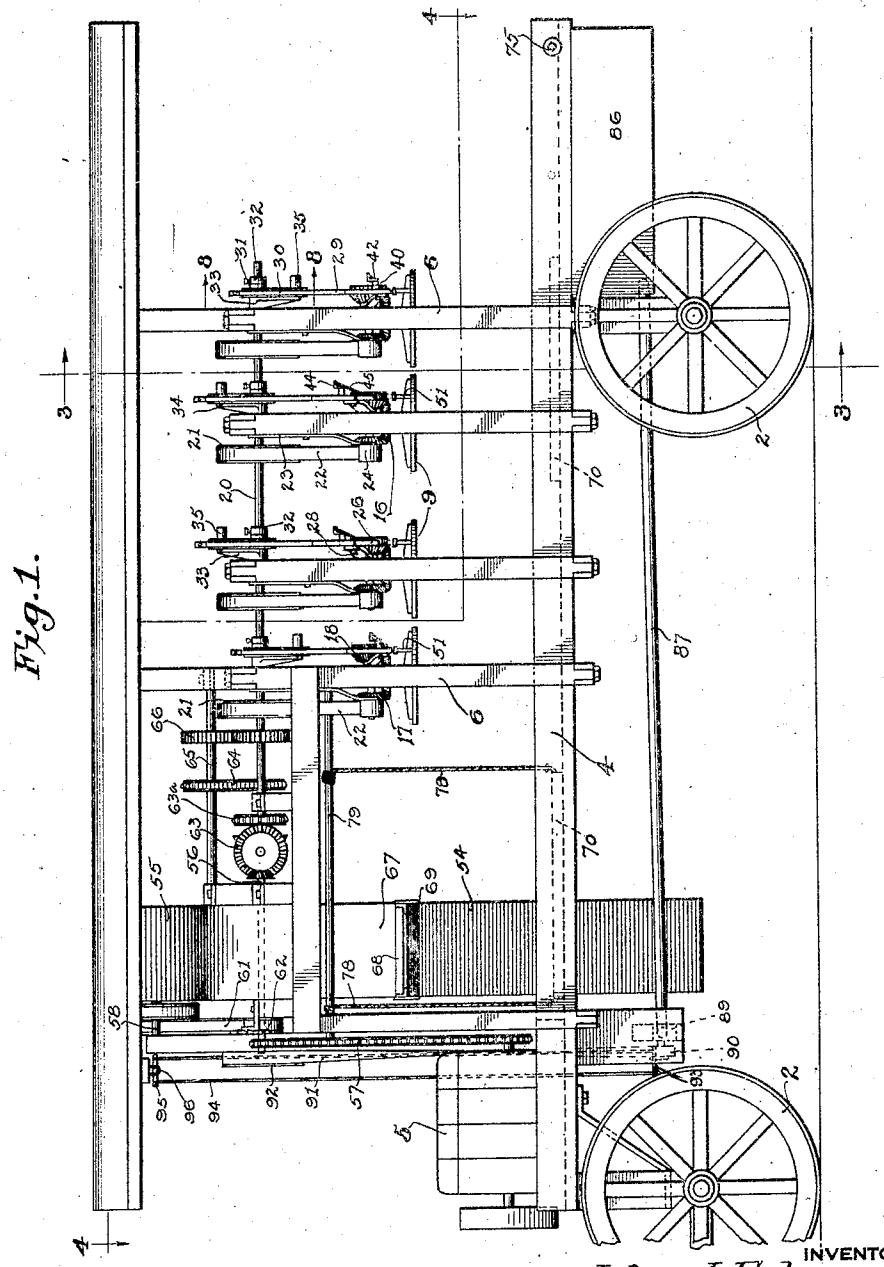


Fig. 1.

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WITNESSES
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Fig. 2

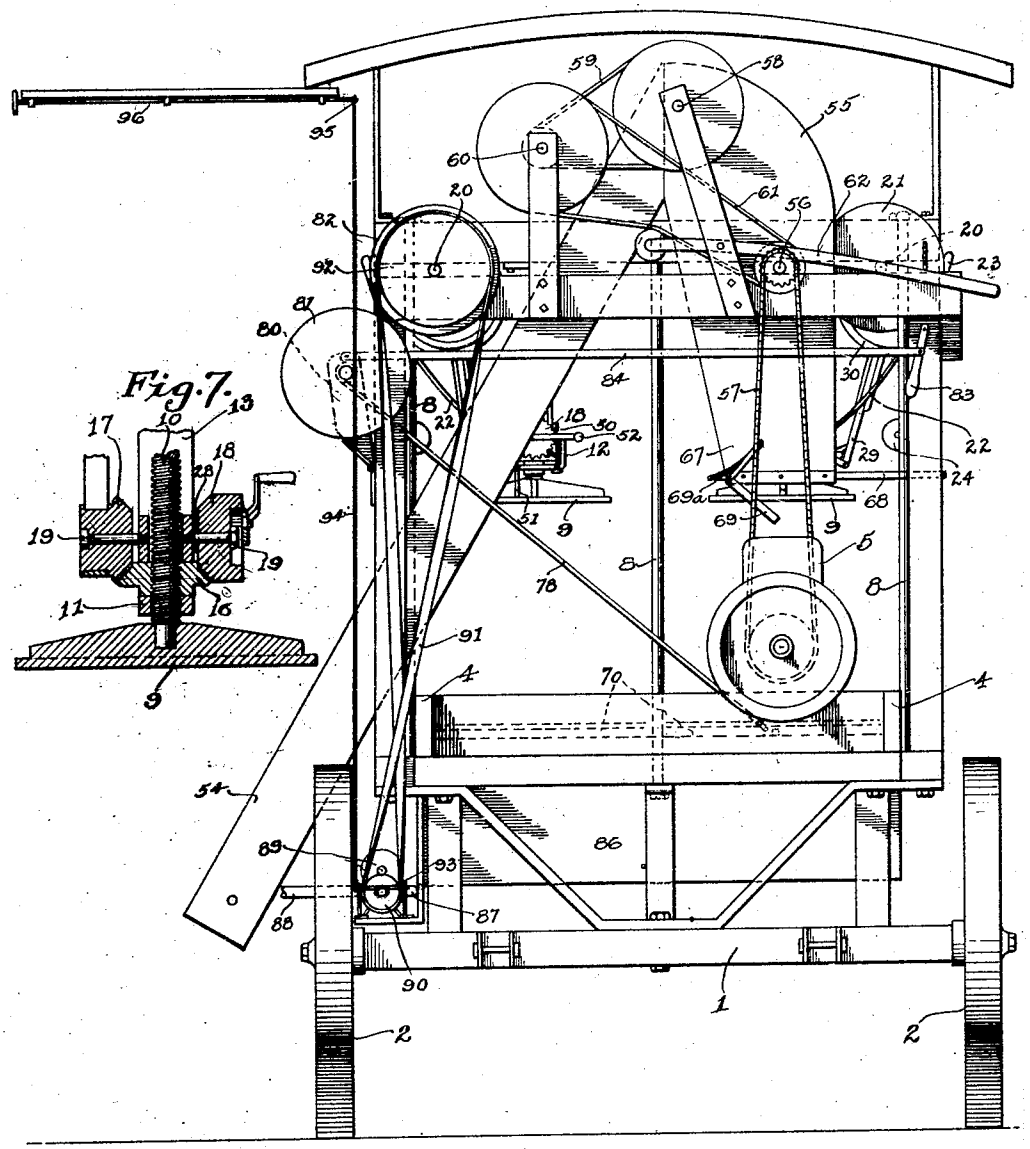


Fig. 7.

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WITNESSES

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Fig. 3.

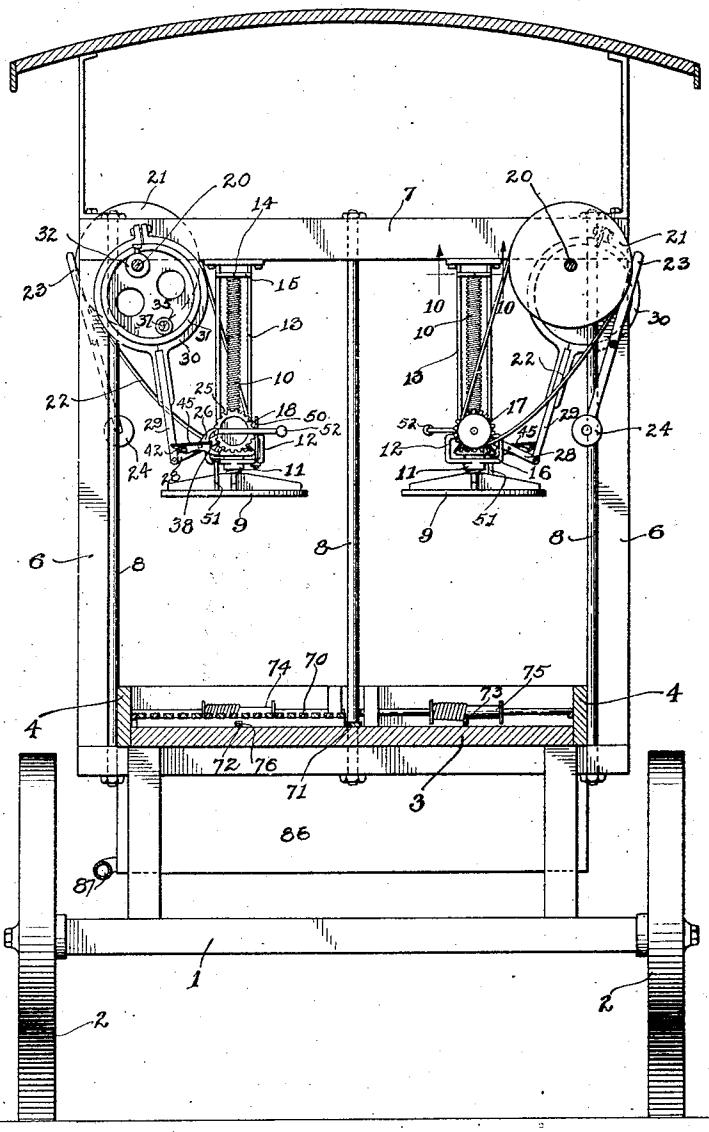
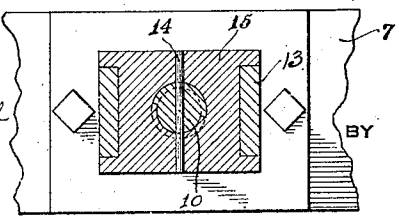


Fig. 10.



WITNESSES

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Filed April 4, 1925 4 Sheets-Sheet 4

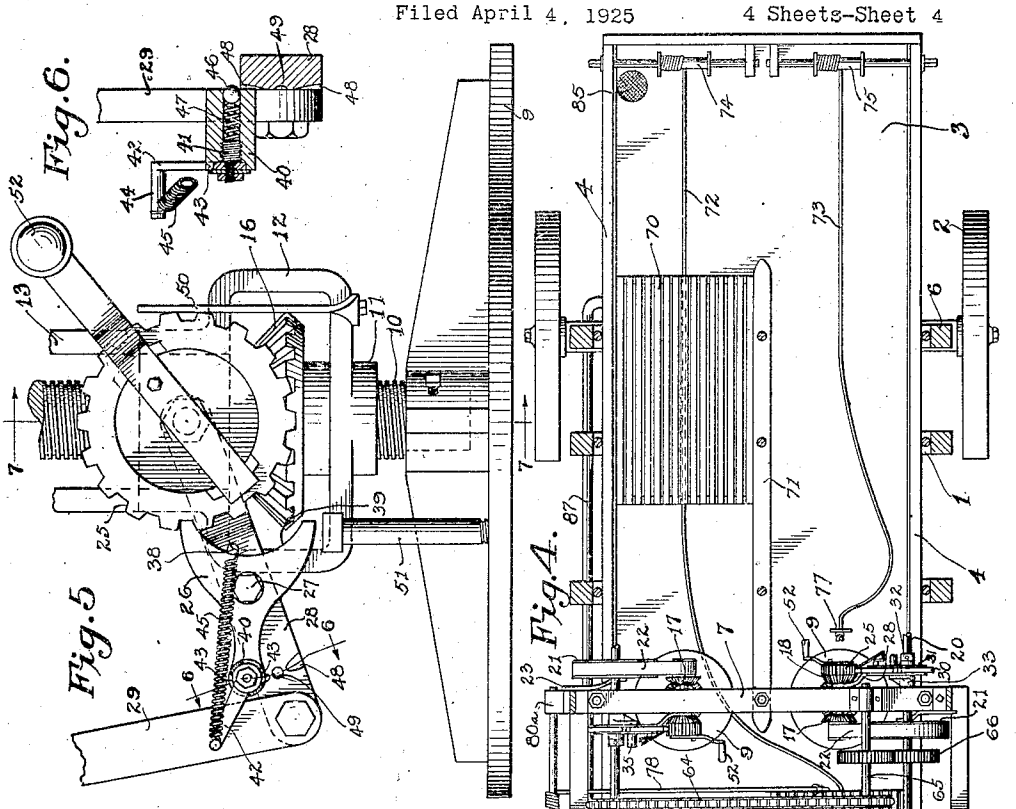


Fig. 6.

Fig. 5

Fig. 4.

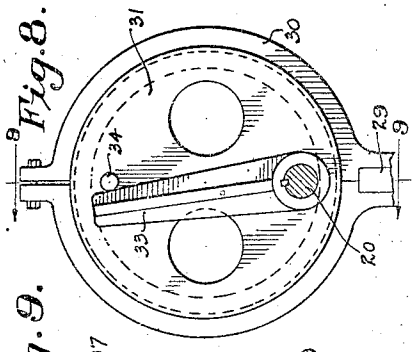


Fig. 8.

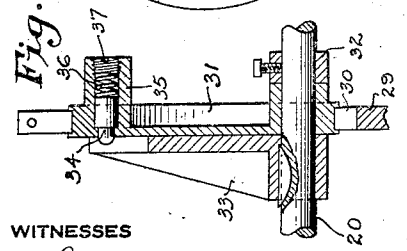


Fig. 9.

WITNESSES

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Patented Dec. 28, 1926. 1,612,366

UNITED STATES PATENT OFFICE.

JOHN JEROME FAHRNEY, OF TIMBERVILLE, VIRGINIA, ASSIGNOR OF ONE-FOURTH TO JACOB AARON GARBER AND ONE-FOURTH TO HENRY NEY, BOTH OF HARRISONBURG, VIRGINIA, AND ONE-FOURTH TO JOHN THOMAS HELBERT, OF BROADWAY, VIRGINIA.

CIDER PRESS.

Application filed April 4, 1925. Serial No. 20,691.

This invention relates to presses of the type used in the manufacture of cider, wine and the like, and includes various improvements, the general objects of which are to increase the efficiency and the capacity of the press, to insure a continuous, rapid and uniform production of cider, and by means of automatic devices to carry on operations with a minimum amount of manual labor.

The specific construction of the invention and the advantages thereof will be more particularly explained in connection with the accompanying drawings, which illustrate one embodiment of the invention.

In the drawings:

Figure 1 is a side elevation of the invention.

Figure 2 is a front elevation thereof.

Figure 3 is a vertical section taken on the line 3—3 of Figure 1.

Figure 4 is a plan view with part shown in horizontal section on the line 4—4 of Figure 1.

Figure 5 is an enlarged detail view showing the means for actuating the presser plate.

Figure 6 is a detail sectional view taken on the line 6—6 of Figure 5.

Figure 7 is a detail sectional view taken on the line 7—7 of Figure 5.

Figure 8 is a detail view of another part of the mechanism for actuating the presser plate, the same being taken on the line 8—8 of Figure 1.

Figure 9 is a detail sectional view taken on the line 9—9 of Figure 8.

Figure 10 is a detail sectional view taken on the line 10—10 of Figure 3.

The invention, as herein shown, is mounted on a portable frame or vehicle 1, which is supported by ground wheels 2. The frame is provided with a floor or bed 3, which is surrounded by side walls 4, and which receives the juice as it is pressed from the pomace. The front end of the frame supports a motor 5, which drives the mechanism for operating the press. Secured to and extending upwardly from the sides of the frame 1 are posts 6 connected at their upper ends by girders 7, which are connected to the frame 1 by vertical tie rods 8, so as to form a strong and rigid structure which is able to withstand the great pressure used in pressing out the juice from the pomace.

In preparing the pomace for pressing, it is packed in burlap to form so-called cheeses and is then arranged in stacks beneath the presser plates 9, which are moved downwardly by means hereinafter described to press out the cider. There are a plurality of presser plates 9, preferably four in number, at each side of the machine. These plates are arranged in pairs so that two plates may be used on each stack of cheeses.

Each presser plate 9 is secured to the lower end of a vertical screw 10, which is guided for vertical movement in a sleeve 11, formed on a bracket 12 carried at the lower end of a frame 13, which is secured in depending relation to one of the girders 7. The upper end of the screw 10 is secured by a pin 14 to a block 15, which is guided vertically on the sides of the frame 13.

As shown in Figure 7, a beveled gear 16 is threaded on the screw 10 and is held against vertical movement between the collar 11 and bracket 12, so that a rotation of said gear imparts a vertical movement to the screw and to the presser plate 9. Two beveled gears 17 and 18 are revolubly mounted on stud bolts 19 secured to the bracket 12, and are in mesh with the gear 16, so that the latter may be driven by either one of the gears 17, 18.

Above each row of presser plates there is mounted a shaft 20, having a sheave 21 secured thereto above each of the beveled gears 17, and adapted to be connected by a belt 22 in driving relation to the gear 17, the latter being provided with a hub for this purpose. The belt 22 is normally loose, so as to ride idly over the hub of the beveled gear 17, but is adapted to be temporarily tightened by means of a lever 23, having a roller 24 to engage the belt.

For driving the beveled gear 18, the latter is provided with peripheral notches 25 adapted to be engaged by a pawl 26, which is reversible, so that the gear may be driven step by step in either direction. The pawl 26 is intermediately pivoted on a stud bolt 27 secured to a lever 28, which is fulcrumed at its inner end on one of the bolts 19, and at its outer end is connected to the lower end of

a link or pitman 29. The pitman 29 has a ring 30 at its upper end, which embraces an eccentric 31 mounted on the shaft 20 between a collar 32 and an arm 33, and normally rotatable with the shaft to move the pitman up and down, and to rotate the beveled gear 18 step by step.

The arm 33 is keyed to the shaft 20, while the eccentric 31 is loosely mounted thereon. The eccentric, however, normally rotates with the arm 33 by reason of a pin 34, which is mounted in a socket 35 formed in the eccentric, the pin being projected by a spring 36 into the path of the arm 33. The extremity of the pin 34, however, is rounded, and in case considerable resistance is met, the pin will be forced inwardly, and the arm 33 will ride over the pin. A plug 37, in the end of the socket 35, may be adjusted so as to vary the tension of the spring 36.

The pawl 26 may be rocked about the bolt 27, so as to bring either one of its teeth into engagement with the beveled gear 18, the rocking movement of the pawl being limited in either direction by a pin 38 secured to the lever 28 and engageable with the concave face 39 at the inner end of the pawl. The outer end of the pawl 26 is provided with a socket 40 which receives a plug 41 having a finger 42 mounted thereon, said finger having a limited lateral movement between two lugs 43 projecting from the end of the socket. The outer end of the finger 42 is turned laterally, as at 44, and connected by a contractile coiled spring 45 to the pin 38.

In the position shown in Figure 5, when the pitman 29 is moved upwardly, the pawl engages one of the notches 25 in the beveled gear 18, and rotates the latter a step, and when the pitman moves downwardly the pawl rides into the next notch, and upon the next upward movement of the pitman rotates the gear another step. The rocking movement of the pawl 26 about the pivot bolt 27 is limited by a ball or the like 46, which is yieldingly held by a spring 47 mounted within the socket 40, so that it engages the notch 48 in the side of the lever 28. When it is desired to reverse the action of the pawl, the latter may be easily swung to a reverse position, the ball 46 being pressed into the socket 40 in opposition to the spring 47 to permit the same to be swung to the other side of the lever. The lever 28 also is provided with an intermediate recess 49, with which the ball 46 may be engaged to hold the pawl in neutral position. A spring 50, secured to the bracket 12, engages the beveled gear 18 with sufficient force to prevent it from moving backward as the pawl 26 is moved rearwardly.

In Figure 5, the position of the pawl 26 is such that the reciprocation of the pitman 29 causes the step by step movement of the beveled gears in a direction to move the screw 10 and presser plate 9 upwardly. A pin 51 is secured to the plate 9, and is adapted to engage the pawl 26, and automatically throw the pawl to neutral position when the presser plate approaches its uppermost position. This positively prevents the presser plate from jamming against the bracket and causing injury to the machine.

After a stack of pomace has been placed underneath a pair of plates 9, the pawl is set, so that the reciprocation of each pitman 29 will cause the corresponding presser plates to move downwardly step by step. When sufficient pressure is exerted upon the pomace, the resistance will cause the arm 33 to move past the pin 34, thus avoiding injury to the machine. As the juice gradually drains out, the pomace becomes softer and the resistance will be lessened, whereupon the arm 33 will again rotate the eccentric 31, and cause the presser plate 9 again to move downwardly. The attendant may from time to time throw the pawl 26 to neutral position for a short time while the juice is draining from the pomace. After all of the juice has been pressed out, the pawl 26 may be reversed, so that the presser plate will be moved upwardly, as shown in Figure 5. In raising the presser plate, however, it is not necessary to await the slow action of the pawl 26, but the lever 23 may be actuated to tighten the belt 22, so that the screw 10 will be raised by a continuous rotation of the beveled gear 17. A hand crank 52 may also be secured to the beveled gear 18, so that the presser plate may quickly be raised or lowered manually.

The apples are fed to the press by an endless elevator 53, mounted in a frame 54 at the front end of the machine. This elevator delivers the apples into a hopper 55, containing the shredder which is mounted on a shaft 56, and driven directly from the motor 5 by means of sprocket gearing 57. A shaft 58, at the upper end of the elevator, is driven slowly by a belt 59 from a countershaft 60, which, in turn, is driven by a belt 61 from the shredder shaft 56. The belt 61 is normally loose enough to ride idly, but when it is desired to feed apples to the shredder, the elevator may be thrown into operation by means of a belt tightener 62, which acts on the belt 61.

The shredder shaft 56 is connected in driving relation to a set of reducing gears 63, supported at one side of the elevator frame, and operatively connected by sprocket gearing 63^a to one of the longitudinal shafts 20. This shaft is, in turn, connected by sprocket gearing 64 to a jack shaft 65, which is connected by spur gearing 66 to the other longitudinal shaft 20.

The pomace, as it comes from the shredder, passes toward the mouth of the chute

67, which is normally closed by a slide 68. A hinged spout 69 is connected to the slide by a spring 69ª, and is adapted, when the slide is opened, to direct the pomace into a piece of burlap laid beneath the same.

It is customary in the manufacture of cider to put the pomace in burlap to form so-called cheeses, which are stacked upon a rack or press board beneath the presser plate. In the present invention, the racks or presser boards 70 are adapted to be placed beneath the mouth of the chute 67 while the cheeses are being formed and stacked thereon and are then moved longitudinally of the bed 3 between a central partition strip 71 and either side wall 4. The racks or boards 70 are moved along the bed 3 by means of one or the other of the ropes 72, 73 which are adapted to be wound upon windlasses 74 and 75 respectively, mounted at the rear end of the bed. Each rack 70 is provided centrally of its ends with notches 76 large enough to receive the rope 72 or 73, and secured to the end of the rope is a plate 77 adapted to engage the front end of the rack, and draw the latter rearwardly when the respective windlass is rotated to wind up the rope.

When the rack is to be drawn rearwardly by the rope 72, it must first be moved transversely across the bed. This movement is effected by means of ropes 78, which are connected to a longitudinal roller 79 mounted in bearings 80 and 80ª, and adapted to be rotated to wind up the ropes 78 and draw the rack across the bed. One of the bearings, as 80, is hinged, and is normally in the position shown in Figure 2, so that a wheel 81, mounted on the roller 79, is normally idle. When the bearing 80 is swung inwardly, however, the wheel 81 is adapted to frictionally engage a wheel 82 secured to the adjacent shaft 20, and to be rotated thereby to wind up the ropes 78. The bearing 80 is adapted to be swung inwardly by means of a hand lever 83, which is connected thereto by a rod 84.

An outlet 85 is provided at one corner of the bed 3, and permits the cider, as fast as it is pressed out, to run into a tank 86 located beneath the bed, and having an outlet pipe or hose 87. A delivery hose 88 may be connected to the outlet pipe 87, and may be provided with a suitable measuring pump 89. This pump is preferably provided with a pulley 90, which is driven by a belt 91 from a pulley 92, secured to one of the shafts 20. The pulley 90 may be operatively connected to the pump by means of a clutch 93 which is adapted to be engaged or disengaged by means of wires or cords 94, connected to opposite ends of a cross head 95, which is secured to a shaft 96 adapted to be manually operated.

In the operation of the press, one attendant looks after the formation of the cheeses and the stacking of the same upon one of the racks 70, placed beneath the mouth of the chute 67, while another attendant takes care of the pressing. After the first stack is formed, the ropes 78 are attached to the same, and the attendant moves the lever 83 so as to bring the wheel 81 into frictional engagement with the wheel 82, whereupon the ropes 78 are wound about the roller 79, and the rack is moved to the other side of the bed. Before the rack is loaded, the rope 72 is placed beneath the rack in the notches 76, so that as soon as the loaded rack has been transferred to the other side of the bed, the other attendant, by rotating the windlass 74, may draw the rack rearwardly between the partition strip 71 and the right hand side of the bed until it is beneath the first pair of presser plates 9. These presser plates have previously been raised high enough for the stack of cheeses to be placed beneath them. The pawls 26 are now swung into position to move the presser plates downwardly into engagement with the stack of cheeses. While this stack is being pressed, the rope 72 is drawn forwardly, and another rack placed over the same in position to be filled. One man may, therefore attend to the pressing of the first stack of cheeses, while the second stack is being formed. The second stack, after it is formed, is moved across the machine, and then rearwardly in the same manner as the first stack, except that it is stopped beneath the front pair of presser plates.

The man who attends to the pressing may then proceed with the pressing of the two stacks on the right hand side of the machine, while the other attendant proceeds to fill two other racks to be pressed on the left hand side of the machine. These racks are filled and moved beneath the presser plates in the same manner, except that they are moved directly rearwardly by means of the rope 73. By the time the third and fourth stacks are filled, and placed beneath the presser plates on the left hand side of the machine, the first stack of cheeses has been pressed dry. The dry pomace may then be thrown out, and the first and second racks are filled and placed in position in the same manner as before. Thus, with two attendants, the machine may be kept continuously in operation, and the apples will be converted into cider with the greatest expedition.

In the pressing operation, each rotation of the shaft 20 normally causes the gear 18 to rotate the distance between two adjacent notches 25. The screw 10 and presser plate 9 will, therefore, be gradually moved downwardly to press the juice from the cheeses. When a sufficient pressure is developed, however, the pin 34 carried by the eccentric 31 will yield inwardly, permitting the arm 33

to describe a revolution without actuating the presser. The amount of resistance which the pin 34 will withstand without yielding may be determined by the adjustment of the plug 37. As the juice drains out of the pomace, the latter will become softer, and the arm 33 will again rotate the eccentric, 31, causing the presser plate again to move downwardly. When all of the juice has been pressed from the stack, the pawl 26 may be reversed, so that the next rotation of the eccentric 31 will move the presser plate upwardly. As soon as the presser plate has been started in its upward movement so that it will move freely, it may be moved quickly to its upper position by means of the hand crank 52 or by means of the belt 22.

It will be noted that the several arms 33 are all arranged on the shafts 20 at different angles so that the load is uniformly distributed in the same manner as it is in an eight cylinder engine.

Whenever a load of apples is brought in, it may be unloaded into a bin adjacent the lower end of the elevator 53, and the driver may rock the shaft 96 to operate the pump until a predetermined measured quantity of cider is delivered through the hose 88.

From the foregoing description, it will be seen that the process of manufacturing the cider, and delivering the same may be carried out rapidly and continuously with not more than two attendants. While I have shown an assembly of the various instrumentalities which seems best adapted for the purpose stated, it is apparent that numerous modifications may be made in various details of construction and arrangement of the various parts without departing from the salient features of the invention. It is, therefore, my intention to include all such modifications within the scope of the appended claims.

What is claimed is:

1. In a press of the character described, the combination of a bed, a plurality of pressing devices arranged at each side above the bed, means for delivering pomace at one side of the bed in front of the pressing devices, a rack on which the pomace may be stacked, means for optionally moving the loaded rack transversely of the bed, and means for selectively moving the rack rearwardly at either side of the bed to bring it under any selected pressing device.

2. In a press of the character described, the combination of a bed having side and end walls, two longitudinal rows of pressing devices arranged on opposite sides of the machine above the bed, means for delivering pomace at one side of the bed in front of the pressing devices, a rack on which the pomace may be stacked, means for optionally moving the loaded rack transversely of the bed, means for selectively moving the rack rearwardly at either side of the bed to bring it under any selected pressing device, and a longitudinal partition strip located centrally of the bed and cooperating with either side wall thereof to form a guideway for the rack as it is moved rearwardly.

3. In a press of the character described, the combination of a bed, a plurality of pressing devices arranged at each side of the press above the bed, power means by which said pressing devices are driven, means for delivering pomace at one side of the bed in front of the pressing devices, a rack on which the pomace may be stacked, a rotatable member at the side opposite to the point where the pomace is delivered and carrying ropes which are engageable with the rack, means adjacent the delivery point to connect said rotatable member to said power means so as to wind up the ropes and move the rack transversely across the bed, and means for selectively moving the rack rearwardly at either side of the bed to bring it under any selected pressing device.

4. In a press of the character described, the combination of a bed having side and end walls, a plurality of pressing devices arranged at opposite sides of the press above the bed, power means by which the said pressing devices are driven, means for delivering pomace at one side of the bed in front of the pressing devices, a rack on which the pomace may be stacked, a roller at the side opposite to the point where the pomace is delivered, ropes attached to the roller and engageable with the rack, means adjacent the delivery point to cause said roller to be driven from said power means so as to wind up the ropes and move the rack transversely across the bed, means for selectively moving the rack rearwardly at either side of the bed to bring it under any selected pressing device, and a longitudinal partition strip located centrally of the bed and cooperating with either side wall thereof to form a guideway for the rack as it is moved rearwardly.

5. In a press of the character described, the combination of a bed, a row of pressing devices arranged at each side of the machine above the bed, means for delivering pomace at one side of the bed in front of the pressing devices, a rack on which the pomace may be stacked, means for optionally moving the loaded rack transversely of the bed, a windlass at each side of the bed at the rear end thereof, each windlass having a rope attached thereto, an abutment at the free end of each rope, said rack having a notch in its under side for selectively receiving one of said ropes, the abutment being engageable with the front edge of the rack to move the latter rearwardly when the windlass is rotated to wind up the rope.

6. In a press of the character described, the combination of a bed, a longitudinal row of pressing devices arranged above the bed, means for delivering pomace in front of the pressing devices, a rack on which the pomace may be stacked, a windlass at the rear end of the bed and having a rope attached thereto, an abutment at the free end of each rope, said rack having a notch in its underside for receiving said rope, the abutment being engageable with the front edge of the rack to move the latter rearwardly when the windlass is rotated to wind up the rope.

7. In a screw press, the combination of a bed, a vertically disposed screw above the bed having a presser plate secured to its lower end, a frame in which the screw is guided for vertical movement, a wheel in which the screw is mounted, means for rotating said wheel to move the screw up or down, said means including a wheel with peripheral notches, a lever having a reversible pawl mounted thereon and engageable with said notches, yieldable means for holding the pawl in either extreme position or in neutral position, power means for oscillating the lever and moving the screw up or down step by step, and a stop carried by the presser plate and engageable with the pawl to shift the same to neutral position when the screw has reached the limit of its upward movement.

8. In a screw press, the combination of a bed, a vertically disposed screw above the bed having a presser plate secured to its lower end, a frame in which the screw is guided for vertical movement, a wheel in which the screw is mounted, means for rotating said wheel to move the screw up or down, said means including a power shaft having an arm secured thereto, a member mounted on the power shaft and operable when rotating therewith to raise or lower the screw, and an abutment carried by said member and normally projecting into the path of said arm and yieldable to permit the arm to move past the same when a predetermined resistance is encountered by the presser plate.

9. In a screw press, the combination of a bed, a vertically disposed screw above the bed having a presser plate secured to its lower end, a frame in which the screw is guided for vertical movement, a beveled gear wheel into which the screw is threaded, means for rotating said gear wheel to move the screw up or down, said means including a beveled drive gear in mesh with the first mentioned gear wheel and having peripheral notches, a lever having a reversible pawl mounted thereon and engageable with said notches, a power shaft having an arm secured thereto, a member mounted on the power shaft and connected with said lever, an abutment carried by said member and normally projecting into the path of said frame, but yieldable to permit the arm to move past the same when a predetermined resistance is encountered.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

JOHN JEROME FAHRNEY.