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PATENTED AUG. 14, 1906.

E. L. McKINNON.  
CHEESE PRESS.

APPLICATION FILED AUG. 19, 1904. RENEWED JAN. 25, 1906.

2 SHEETS—SHEET 2.

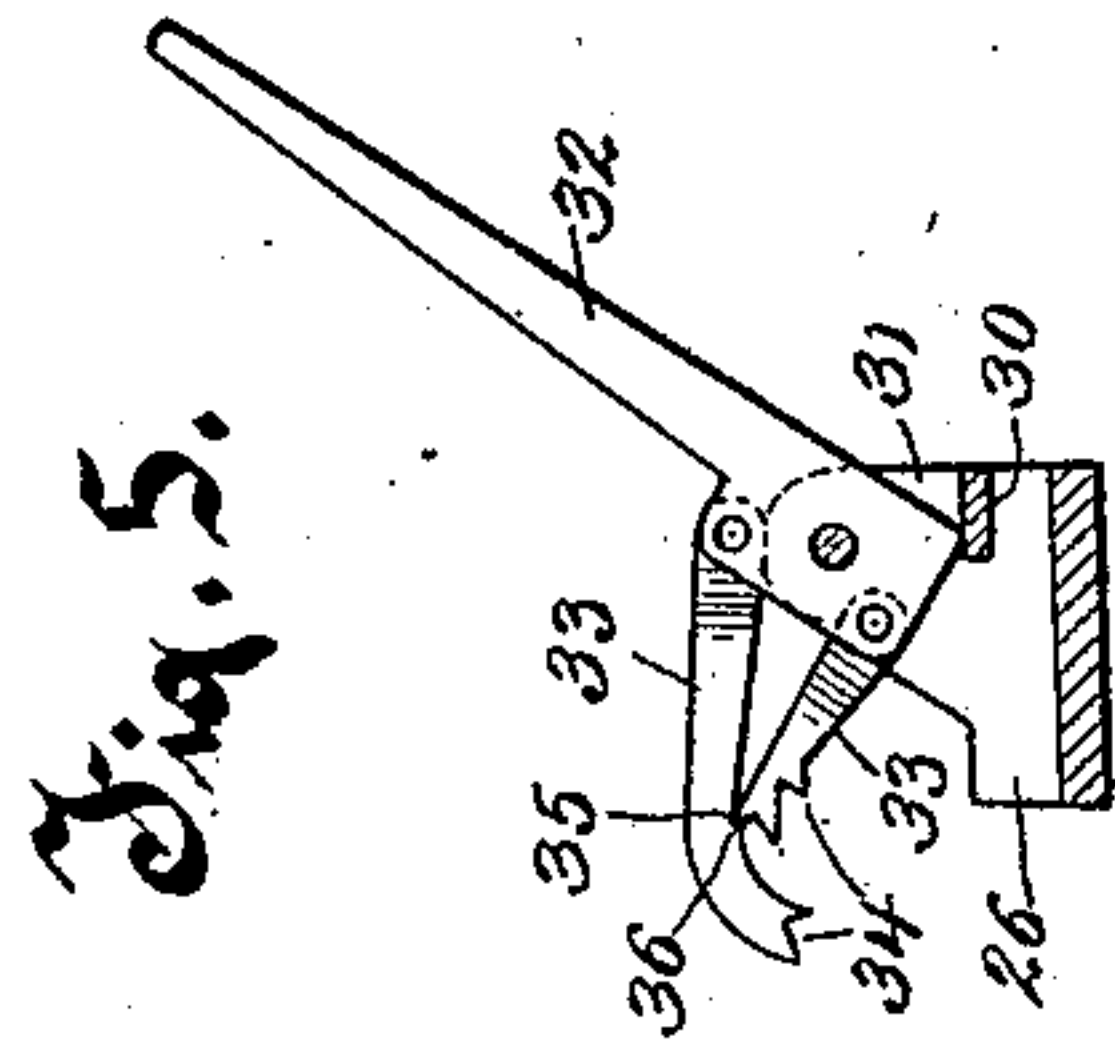


Fig. 6.

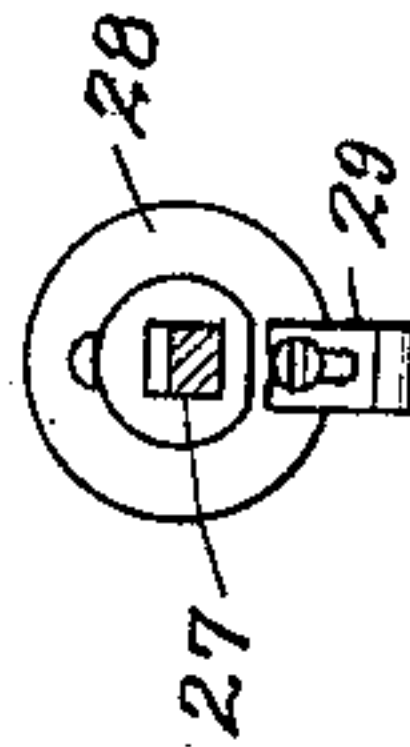


Fig. 24.

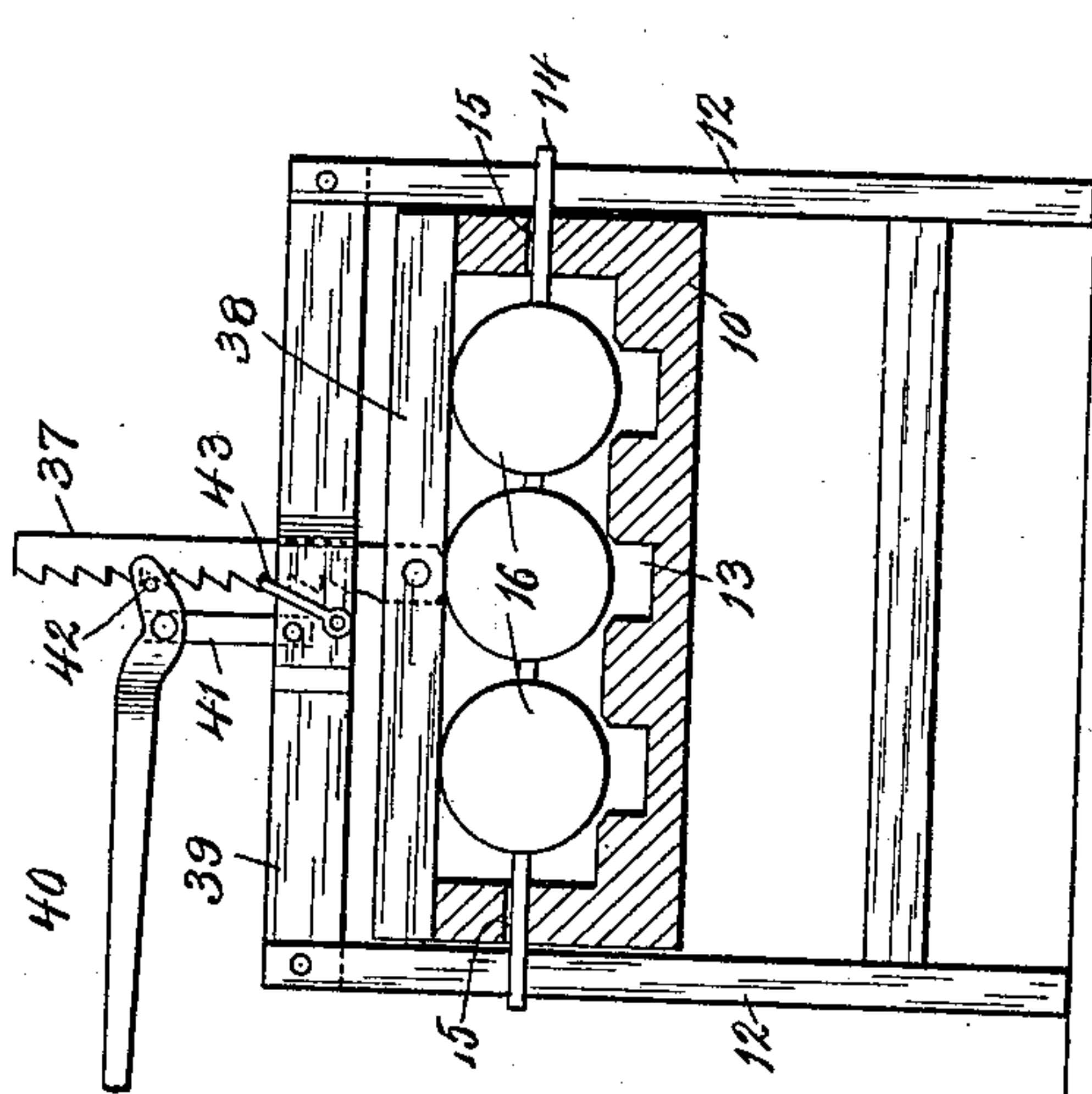
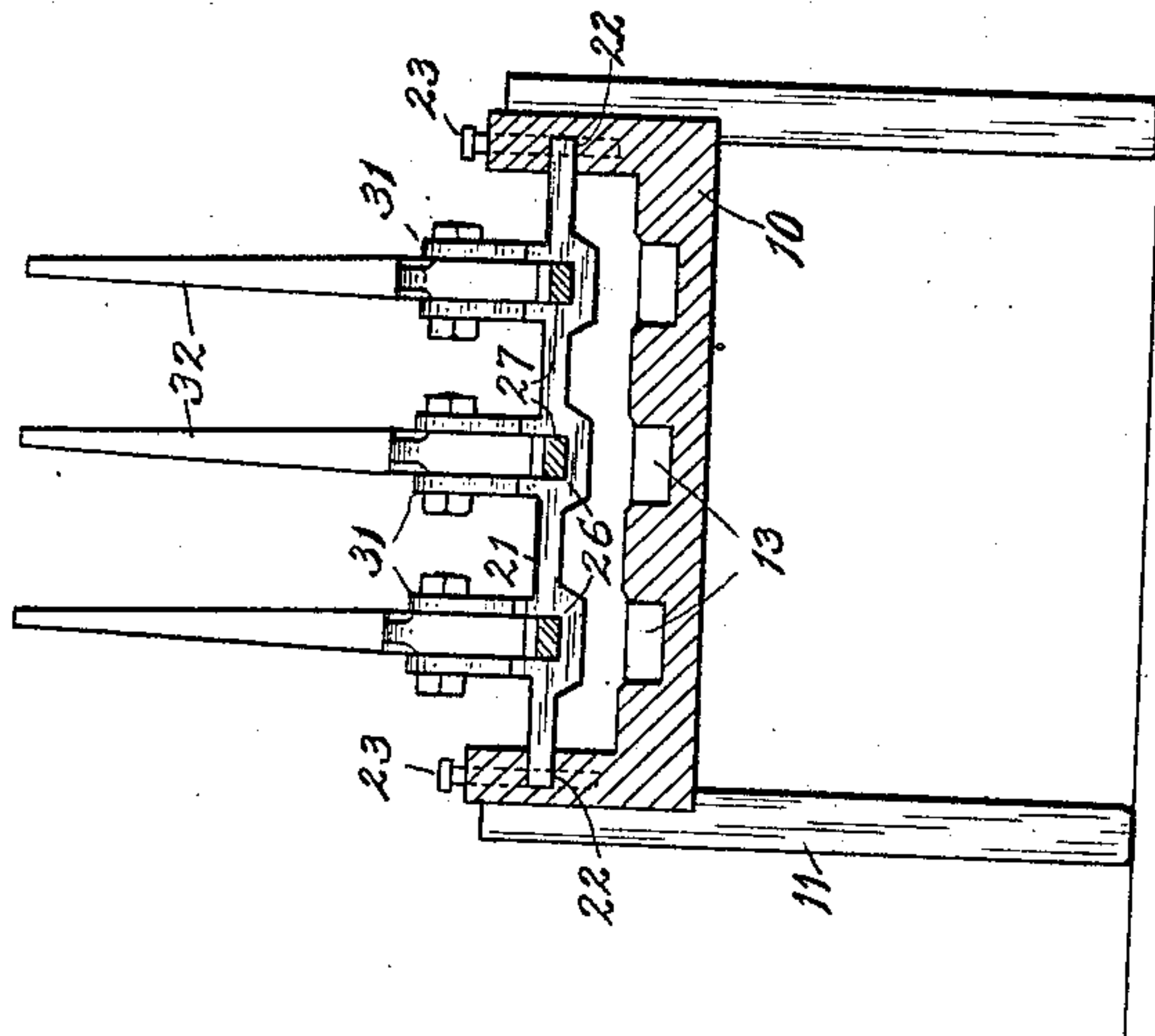


Fig. 3.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## CHEESE-PRESS.

No. 828,421.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed August 19, 1904. Renewed January 25, 1906. Serial No. 297,778.

*To all whom it may concern:*

Be it known that I, ELMER L. McKINNON, residing at Sheboygan Falls, in the county of Sheboygan and State of Wisconsin, have invented new and useful Improvements in Cheese-Presses, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

10 This invention relates to cheese-presses, and has for its object to improve upon the construction and operation of presses for use in the manufacture of cheese.

15 An object of this invention is to provide for quickly and easily applying pressure to the cheese by a means capable of adjustment toward the cheese.

20 Another object of this invention is to provide a rack-feeding means for the pressure-blocks.

25 A further object of this invention is to provide a cheese-press in which the weight of the cheese serves to maintain the pressure thereon, with a novel means for raising and supporting the movable end of the cheese-press independent of the pressure-maintaining device.

30 A still further object of this invention is to improve upon details of construction and arrangement of parts of cheese-presses.

With the above and other objects in view the invention consists in the devices and parts and their equivalents, as hereinafter set forth.

35 Referring to the accompanying drawings, in which like characters of reference indicate the same parts in the several views, Figure 1 represents a side elevation, partly in section, of a cheese-press embodying this invention. 40 Fig. 2 is a plan view thereof. Fig. 3 is a transverse sectional view on the line 3 3 of Fig. 1. Fig. 4 is a transverse sectional view on the line 4 4 of Fig. 1. Fig. 5 is a vertical sectional view of the rack-frame, showing 45 one of the operating-levers with its pawls engaged; and Fig. 6 is a rear elevation of one of the pressure-blocks with the rack-bar sectioned.

50 In the drawings, 10 represents the press-box, which is supported at its rear end by the legs 11 and at its front end by the frame 12, and a continuous-pressure device in a manner to be later described.

55 The box is provided with a series of troughs 13, extending lengthwise of its bottom and upon each of which a series of cheese-hoops

(not shown) is adapted to be placed, and a transverse bar 14 is slidably mounted in elongated slots 15 in the sides of the box 10 and carries rigidly mounted thereon a series of 60 head-blocks 16, against which the cheese-hoops are to be pressed.

The transverse bar 14 is given a tendency to move toward the cheese by mechanism 65 actuated by the weight of the cheese, similar to that shown and described in Letters Patent of the United States No. 735,133, granted to me on August 4, 1903. Briefly, this mechanism consists in the following parts arranged in duplicate on the opposite sides of 70 the cheese-press: A link 17 has its looped end engaged over the end of the transverse bar 14, which projects through the slot 15 and connects it with the yoked arm of a bell- 75 crank lever 18, which is pivoted to a bracket 18' on the side of the press-box 10, and whose other arm is elongated and yoked and adapted to be adjustably and pivotally connected to a standard 19 by a pivotal bolt 20, for receiving which the standard and arm are pro- 80 vided with series of perforations.

Mounted to slide longitudinally in the press-box is a rack-frame 21, with its ends fitting in grooves 22 in the sides of the box, and it is held against movement from its several 85 adjusted positions by means of pins 23, fitting in perforations 24, arranged in series along the box sides, which pins when so placed are adapted to pass through openings 25 in the ends of the rack-frame 21. 90

The rack-frame 21 is provided with a series of rack-guides 26 in the form of depressed channels, through which slide rack-bars 27, which carry at their forward ends pressure- 95 blocks 28. The pressure-blocks receive support from runners 29, which ride in the troughs 13 and are adjustably secured to the under side of said pressure-blocks by screw-and-slot connections, as clearly shown in Fig. 6. Each rack-guide 26 is provided at its rear 100 end with a bridge-piece 30, which is located just above the teeth of the upper edge of the rack-bars 27 and serves to prevent displacement of the rack-bar.

The side walls of the rack-guides 26 are 105 extended upwardly to form duplicate bearings 31, between each pair of which is pivoted an operating-lever 32, having at its lower end on opposite sides of its pivotal connection a pair of pivoted pawls 33, provided 110 with one or more teeth 34 for engaging with the teeth of the rack-bar 27 therebeneath.



The lower pawl 34 is provided with a spur 35 on its extreme end, which is capable of engaging with a notch 36 on the under side of the upper pawl 33, so that when it is desired to relieve the rack-bar of engagement by the pawls the lower pawl 34 may be raised until its spur 35 engages with the notch 36 of the other pawl, and the operating-lever 32 when thrown into its extreme rear position, as shown in Fig. 5, will then lift the engaged pawls out of the path of the teeth of the rack-bar and said rack-bar will be free to be moved in either direction within the rack-guide.

The forward movement of the operating-lever 32 will cause the upper pawl 33 to force the rack-bar 27 forward, while the lower pawl 32 travels rearwardly on the teeth of the rack-bar to take up a new engagement farther to the rear on said rack-bar. A rearward movement of the operating-lever 32 will cause the lower pawl 33 to force the rack-bar forward while the upper pawl 33 moves rearwardly to take a new position on the teeth of the rack-bar, so that the oscillations of the operating-lever 32 serve to force the pressure-blocks 28 forward during both motions of said operating-lever.

The means for suspending the front end of the press-box from the frame 12 comprises a rack-bar 37, which is attached to a bar 38, forming a part of the press-box, and which extends upwardly through the central slotted portion of a transverse bar 39, forming the top piece of the frame 12. A lifting-lever 40 is pivoted to a link 41, which in turn is pivoted within the slot of the transverse bar 39, and at its shorter yoked end said lifting-lever is provided with a pin 42 to engage with the teeth of the rack-bar 37, so that the operation of the lifting-lever 40 will by such engagement raise the rack-bar 37 and the press-box connected therewith. A catch 43 is pivoted to the transverse bar 39, preferably by embracing said slotted portion of the transverse bar 39 and pivoted to the outside thereof, and is adapted to be swung into engagement with the teeth of the rack-bar 37, so as to retain said rack-bar in its raised position to thereby hold the front end of the press-box in its elevated position and enable the lifting-lever 40 to take a new hold on said rack-bar or for other purposes.

The operation of this invention is as follows: The press-box being raised to its uppermost position by the operation of the lifting-lever 40 and locked there by the catch 43, the series of cheese-hoops are arranged in the troughs 13 thereof with one end of each series resting against one of the head-blocks 16 and the other end of the series engaged by one of the pressure-blocks 28. The rack-frame 21 is carried forward as far as possible and secured in position by placing the pins 23 in the perforations 24, and then

the operating-levers 32 are oscillated to force the pressure-blocks 28 against the cheese by the coöperation of the pawls 33 with the racks 27, as above described. The cheese within the hoops is compressed by the forward movement of the pressure-blocks 28, as the transverse bar 14 is prevented from receding from the cheese by its having reached the ends of the slots 15. When the cheese has been given the desired pressure in the manner above described, the lifting-lever 40 is operated to relieve the catch 48 from the weight of the press-box, and said lifting-lever is permitted to swing to slowly lower the press-box until the weight of the front end of said press-box is thrown upon the continuous-pressure means at the sides of the press-box. The weight of the front end of the press-box with the cheese contained therein has a tendency to lower the pivotal connections 18' of the bell-crank levers 18, and the standards 19 by their pivotal connections 20 with the longer arms of the bell-crank levers 18 form fulcrums on which the longer arms of the bell-crank levers 18 swing as the result of such movement, and thereby cause the bell-crank levers to swing upon their pivots 18' and draw with their shorter arms upon the links 17 to give the transverse bar 14 a tendency to move toward the cheese under compression. The degree of pressure given to the cheese at the front end of the press-box in this manner depends upon the weight of the front end of the press-box with the cheese therein and the location of the pivotal connections 20 and may be varied to suit requirements by the proper adjustment of said pivotal connections 20 on the standards 19 and the longer arms of the bell-crank levers 18. This permits of the maintaining of a pressure upon the cheese during the draining thereof notwithstanding the shrinkage of the cheese, which occurs as the result of the draining, the press-box swinging lower to move the transverse bar 14 closer to the pressure-blocks 28 as the cheese shrinks. When it is desired to remove the cheese, the weight of the press-box is relieved from the continuous-pressure means at the sides thereof by means of the operation of the lifting-lever 40, and when the front end of the press-box is raised to its full extent it is again locked by the catch 43 and the cheese are free to be removed from the troughs, inasmuch as the pressure thereon is withdrawn with the upward movement of the press-box which produces the forward movement of the transverse bar 14.

From the foregoing it will be seen that the cheese-press is adapted to apply the desired pressure to the cheese by the hand-operated means and that then when the cheese have been tightened the weight of the press and cheese furnish their own pressure continuously. The pressure of the cheese between



the head-blocks and the pressure-blocks will hold the press up; but as the cheese shrink under the steady pressure one end of the press gradually settles down, giving the cheese the desired amount of pressure at all times. The lifting-lever at the front end of the press is capable of relieving the continuous-pressure means of the weight of the press-box and the cheese, and in so doing removes the pressure on the cheese by permitting the transverse bar 14 to recede therefrom.

It is obvious that the pawl-and-ratchet feed for the pressure-blocks has the advantage over the screw-feed shown in my former patent above referred to, inasmuch as it is quicker in operation and does not require the back turning of the screw to reset the pressure-blocks, for with the present construction the pawls 33 may be raised from the teeth of the rack-bars 27 by hand and held removed therefrom by engaging the spurs 35 with the notches 36 to freely permit of the retraction of the pressure-blocks.

It is obvious that this invention is not limited to its application to cheese-presses in which a press-box is employed, but that it is applicable to any form of cheese-press, and therefore it is to be understood that the term "press-box" and similar expressions employed in the specification and claims are not to be limited to any particular form of support or guideway for the parts.

What I claim as my invention is—

1. In a cheese-press, a pressure-block, a rack-bar secured thereto, a rack-guide through which the rack-bar passes, an operating-lever pivoted to the rack-guide, a pair of pawls pivoted to the operating-lever, and a spur on one pawl adapted to engage the other pawl so that both pawls may be held out of engagement with the rack-bar.

2. In a cheese-press, a pressure-block, a rack-bar secured thereto, a suitably-mounted operating-lever, a pair of pawls secured thereto and adapted to engage the teeth of the rack-bar, and a spur on one pawl capable of engaging a notch on the other pawl to permit the said pawls being held out of engagement with the teeth of the rack-bar.

3. In a cheese-press, a press-box, a pressure-block operating therein, a rack-bar secured to the pressure-block, a rack-guide through which the rack-bar passes adjustably mounted on the press-box, an operating-lever pivoted to the rack-guide, and a pair of pawls pivoted to the operating-lever and adapted to engage the teeth of the rack-bar, one of said pawls being adapted to engage the other pawl for causing both pawls to disengage the rack-bar.

4. In a cheese-press, a press-box having a trough therein, a pressure-block operating in the press-box, a runner adjustably connected to the pressure-block and sliding in and guided by the trough of the press-box, a

rack-bar secured to the pressure-block, a rack-guide mounted on the press-box and through which the rack-bar passes, an operating-lever pivoted to the rack-guide, and a pawl carried by the operating-lever for engaging the teeth of the rack-bar.

5. In a cheese-press, a press-box having a trough therein, a pressure-block operating in the press-box, a guide-runner adjustably secured to the pressure-block and bearing in the trough of the press-box, a rack-bar secured to the pressure-block, a rack-guide adjustably mounted on the press-box and through which the rack-bar passes, a bridge-piece on the rack-guide to confine the rack-bar in the channel on the rack-guide, an operating-lever pivoted to the rack-guide, and a pair of pawls pivoted to the operating-lever and adapted to engage the teeth of the rack-bar one of said pawls being adapted to engage the other pawl for causing both pawls to disengage the rack-bar.

6. In a cheese-press, the combination with a continuous-pressure means depending upon the weight of the cheese for its operation, of a pressure-block, a rack-bar secured thereto, a suitably-mounted operating-lever, a pawl carried thereby adapted to engage the teeth of the rack-bar, and a means for relieving the continuous-pressure means of the weight of the cheese.

7. In a cheese-press, the combination with a continuous-pressure means dependent upon the weight of the cheese in the press-box for its operation, means for applying pressure to the cheese, a rack-bar secured to the press-box, a supporting-frame guiding the rack-bar, and a lifting-lever having connection with the supporting-frame and adapted to engage the teeth of the rack-bar.

8. In a cheese-press, the combination with a continuous-pressure means dependent in its operation upon the weight of the cheese in the press-box, means for applying pressure to the cheese, a rack-bar connected to the press-box, a supporting-frame guiding the rack-bar, a lifting-lever having connection with the supporting-frame and adapted to engage the teeth of the rack-bar, and a latch for also engaging the teeth of the rack-bar.

9. In a cheese-press, the combination with a continuous-pressure means dependent in its operation upon the weight of the cheese in the press-box, means for applying pressure to the cheese, a rack-bar connected with the press-box, a supporting-frame forming a guide for the rack-bar, a lifting-lever having a link connection with the supporting-frame and adapted to engage with the teeth of the rack-bar to relieve the continuous-pressure means of the weight of the press-box and the cheese, and a latch on the supporting-frame for engaging the rack-bar.

10. In a cheese-press, a press-box having a series of troughs therein, a series of pressure-



blocks operating in the press-box, runners on the pressure-blocks sliding in and guided by the troughs, rack-bars carried by the pressure-blocks, a rack-guide adjustably mounted on the press-box and through which each of the rack-bars passes, an operating-lever for each rack-bar pivoted to the rack-guide, and a pair of pawls on each of the operating-levers engaging the teeth of the rack-bars therefor, one of said pawls of each bar being adapted to engage the other pawl for causing both pawls to disengage the rack-bar.

11. In a cheese-press, the combination with a continuous-pressure means depending in its operation upon the weight of the cheese in the press-box, a series of troughs in the press-box, a series of pressure-blocks slidable in and guided by the troughs, a rack-bar car-

ried by each of the pressure-blocks, a rack-guide adjustably mounted on the press-box and through which each of the rack-bars passes, an operating-lever for each of the rack-bars pivoted on the rack-guide, a pair of pawls on each operating-lever for engaging the rack-bar therefor, a rack-bar connected to the press-box, a supporting-frame, and a lifting-lever having connection with the supporting-frame and adapted to engage the teeth of said rack-bar.

In testimony whereof I affix my signature in presence of two witnesses.

ELMER L. McKINNON.

Witnesses:

JNO. E. THOMAS,  
STEDMAN THOMAS.