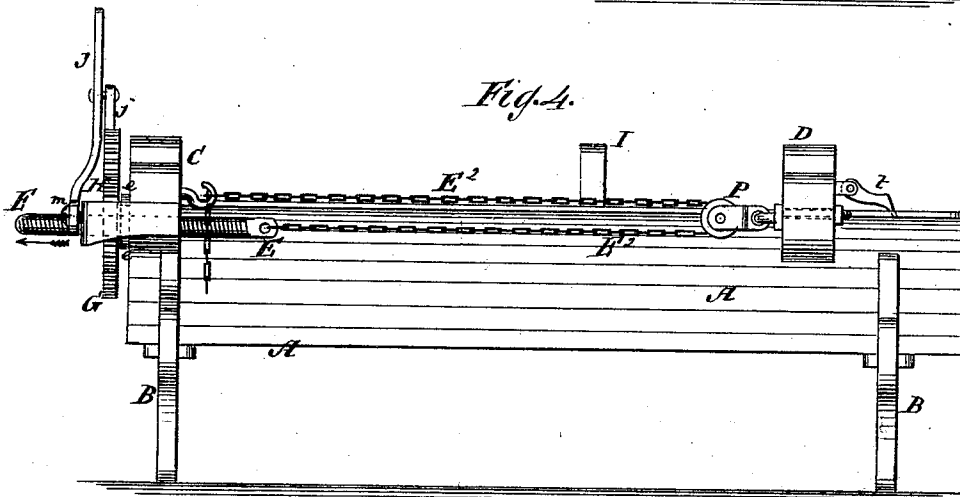
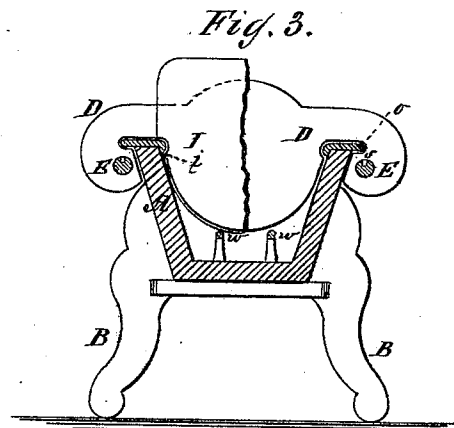
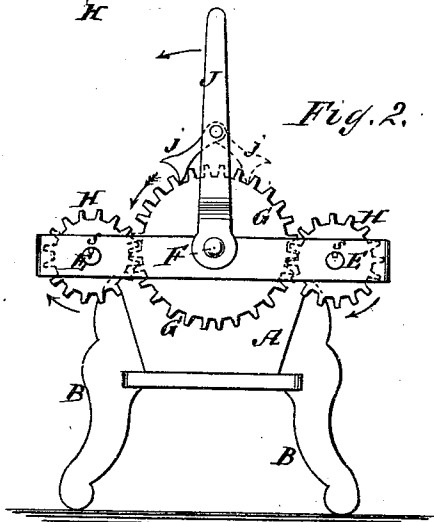
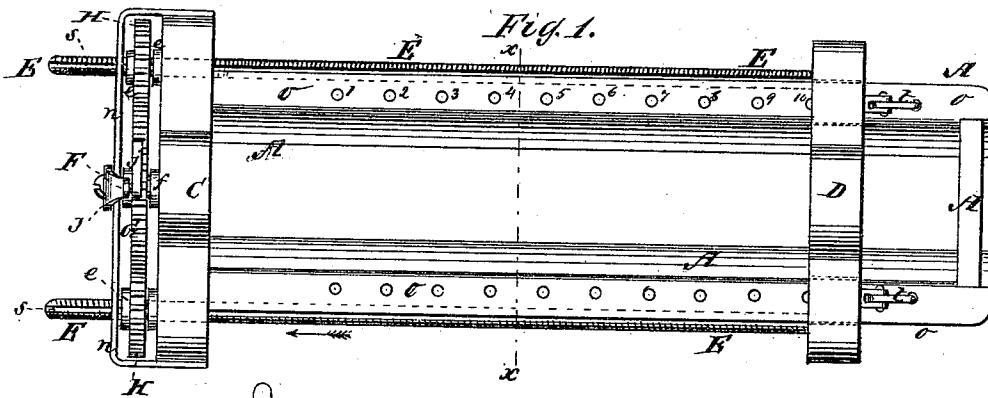


A. S. BEACH.
CHEESE-PRESS

No. 179,505.

Patented July 4, 1876.



Witnesses:
E. Hoff,
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Inventor:
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UNITED STATES PATENT OFFICE

ARAD S. BEACH, OF GROTON, NEW YORK.

IMPROVEMENT IN CHEESE-PRESSES.

Specification forming part of Letters Patent No. 179,505, dated July 4, 1876; application filed June 6, 1876.

To all whom it may concern:

Be it known that I, ARAD S. BEACH, of Groton, in the county of Tompkins, in the State of New York, have invented a new and useful Cheese-Press; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to that kind of cheese-presses which is adapted to operate upon a gang of cheese-hoops, arranged in line in the direction of their axes. Previous to my invention, presses of this kind have been made about the same as an ordinary press, except as to the arrangement of the frame horizontally in lieu of vertically; and in such presses there have been found in practice, among other objectionable features, these serious difficulties, viz., the expressed whey could not so well be collected and carried off as in the case of the ordinary vertical arrangement of press (with the cheese hoop or hoops located over a press-board); the action of the moving platen upon the gang of hoops was liable to be untrue, and a consequent strain on the central screw-shaft and other parts was the consequence; and if many hoops were put in at once, there was liability of a displacement of some of the hoops of the gang out of line, and a consequent imperfection of shape in the cheese molded.

My invention has for its object to provide a gang-press free of all these objections, and in other respects more desirable than any press heretofore made, so far as my knowledge extends; and to these ends and objects my invention consists, first, in a press, the frame or body of which is so provided with or composed of a liquid-tight box, trough, or receptacle, that all the liquid expressed from the hoops placed in the press will be received into and collected by said receptacle, from which it may be conducted off in any desired manner, and by which cleanliness in the press-room is thus insured; second, in the construction of the press with a moving platen properly guided, and two or more actuating screws, or their equivalents, operating to draw or pull

the moving platen toward the stationary end of the press, in lieu of a single central screw operating to push the platen, as heretofore, whereby the action of the press is rendered more certain, and all tendency to twist or strain the parts is effectually avoided; third, in the use, in combination with the frame and movable and stationary platens of a press, of one or more sliding or movable followers, so combined or arranged with the frame that, when adjusted for use, they serve to prevent any bulging out of line or displacement of the hoops composing the gang under treatment, as will be more fully explained; fourth, in the combination, with the box-like frame within which the gang of hoops is placed, of ways or rests for the support of the several hoops, and which permit an expeditious and convenient placement of the hoops in position; fifth, in certain novel combinations of devices involved in the construction of the machine, and hereinafter to be fully described.

To enable those skilled in the art to make and use my invention, I will proceed to describe the construction and operation of a press embracing the several features of improvement constituting my invention.

In the several figures the same part will be found designated by the same letter of reference.

Figure 1 is a top view of a press made according to my invention. Fig. 2 is an end elevation of the same; Fig. 3, a vertical cross-section at the line *xx* of Fig. 1, and Fig. 4 is a side view, showing a modification, which I will presently explain.

In Figs. 1, 2, and 3, A represents the hoop-supporting frame or body of the press, which, it will be seen, is made in the form of an oblong receptacle or box. This box-frame is supported near either end upon suitable leg-frames B B, and is provided at one end with a strong head-block or stationary platen, C, in which are mounted the boxes *e e*, in which work the screw-rods or shafts E E, and also a journal-box, *f*, in which is hung the shaft or stud F of the main gear G. This gear G meshes into or engages with two pinions, H H, arranged on either side of said gear, and which

operate to move the screw-shafts *E E* longitudinally, as will be presently described. *D* is the moving platen, to which are fastened, one at each side, as shown, the screw-rods *E E*, and *I* is a sliding follower, adapted to hold the hoops in place. *J* is a hand-lever, which is pivoted or hinged on a screw, *m*, in line with the axis of the stud *F* of the main gear *G*, and which is provided with a pawl or finger, *j*, which engages with the teeth of said gear *G*, in either of the two positions in which it may be set. The pivot *m* is mounted on a bar, *n*, secured to the press body.

The arrangement of the hand-lever *J* and its pawl *j* with the driving-gear *G* will be best seen at Fig. 2, where I have shown the pawl in one position in full lines, and in the other position in dotted lines, the arrows indicating the direction of motion of the hand-lever and gear *G*.

Each of the pinions *H H* has its hub tapped out, so as to form a nut or female screw, in which works one of the screw-shafts *E*, and each of these shafts is splined out or grooved, as seen at *s*, during its length, so that a feather projecting from each fixed stud *e e* enters such spline or groove and prevents any rotation or turning round of the screw-rod.

If, however, it be deemed expedient, the screw-shafts *E E* may be made fast in the pinions *H H*, so as to be rotated by them, and female screws or nuts may be formed in the movable platen *D*, so that the latter will travel along on the screw-shafts while said screw-shafts are rotated by the gears.

The sliding follower *I* is so formed and arranged with the press-body that, while it may be readily extricated or removed therefrom, it can only slide lengthwise of the body *A* when adjusted for operation, and cannot rise up or lift out of its bearings or seat. The peculiar arrangement of this follower *I* with the press-frame will be best understood by reference to Fig. 3, where I have shown one-half of it, and where it will be seen that said follower is made to rest slightly and slide on top of the upper edge of the body *A*, and is formed at *t* with lugs or projections (one on each side) that fit and slide beneath the projecting metal top plates *O* of the press-frame. As shown, the follower *I* is made of wood, with its lower semicircular edge bound with a metal rib, *p*.

I employ metallic plates *O* on the upper edge of the frame *A* from preference, but other means may be employed than the projecting edges of these plates for holding down the followers.

In the plates *O* are numerous holes or notches, 1 2 3, &c., with which engage two hold-fasts or retaining-pawls, *t t*, hinged to the back side of the moving platen *D*, and which may serve to relieve the screws, nuts, &c., from continued strain.

Of course, regular ratchets or toothed bars

may be employed on top of the frame *A*, if deemed expedient. *w w* are ways or bars, forming a sort of track, upon which the hoops may be placed and slid along to the proper positions, both in putting in and taking out the cheese-hoops. The arrangement of these ways *w w* will be best seen at Fig. 3; their form and arrangement may, however, be varied at pleasure so long as they are so made and placed as to conveniently serve the desired purpose.

The operation of the described machine may be thus explained: The gang or series of hoops, filled with curd and ready to be subjected to the action of the press, are placed in line in the box or frame *A*, (their axes about in line with the middle of the moving platen *D*), the platen *D* having first been run back to the proper position. In arranging the hoops in place, if there be many in the gang, one or more of the sliding "followers" *I* are put in and adjusted, here and there, at suitable intervals between the hoop-heads, and the platen *D* is then moved toward the stationary head-block *C*. The movement of the platen *D* to effect the necessary pressure is thus accomplished: The operative taking hold of hand-lever *J* vibrates it (as far as convenient) in the direction indicated by the arrow at Fig. 2, and then, pushing the lever back, repeats the vibration any requisite number of times, by which back and forth movement of the lever the gear *G* is intermittently rotated, and the pinions *H H* caused to turn in the proper direction, as indicated by arrows at Fig. 2.

As in the arrangement shown the pinions cannot move laterally, and the screw-shafts *E* cannot turn round, the result of this rotation of the said pinions (in the hubs of which the screws fit, as before mentioned) is to draw the rods along endwise, as per arrows at Figs. 1 and 4, and thus move the platen *D* along to perform the pressing together in the desired manner of the cheese-hoops (and the hoop-followers, if the latter be used;) but, as before mentioned, the details of construction may be so modified, if preferred, that by the rotation of the gears the screw-shafts will be rotated, and the moving platen *D* be caused to travel along on said screw-shafts.

As the pressing operation is performed, and the pawls *t* of the moving platen *D* engage, successively, with one and another of the notches 1 2 3 &c. of the frame *A*, the locking together thus of the platen and frame may be taken advantage of to partially, or wholly, relieve the screws, nuts, and other working parts from continued strain during the retention of the gang of cheeses under pressure.

When it is desired to run back the movable platen for the ready removal of the cheese-hoops, sliding followers *I*, &c., and for the insertion in the press of a fresh gang, the operative simply turns the pawl *j* of lever *J* over

into the position indicated by the dotted lines at Fig. 2, when, by the same vibratory movement of the hand-lever, heretofore explained, the gear G will be intermittently rotated in a direction opposite to that before mentioned, whereby the screw-rods E will be pushed back to their former positions, (or as far back as may be desired,) or if the machine be made with the screw-shafts to work in nuts formed in the platen D, said rods E will be rotated in an opposite direction, and the platen thus runs back.

During the operation of pressing the cheese, and while the latter is kept in press, every drop of the expressed liquid must be caught in the box or receptacle A, from which it is drawn off, or is permitted to run off at any desired point, for conveyance to some proper locality of final discharge from the establishment, and thus it will be seen that perfect cleanliness, which is of the greatest importance, is insured, since there can be no waste of the whey on the floor, or from the press in the press-room.

By the employment of a series of screws, or their equivalents, pulling simultaneously on the platen to be moved, not only may the press be made equally strong and durable with less weight of material, but all strain tending to twist the parts, in case of the gang not being exactly centered, is avoided, and the presence of any centering contrivance rendered unnecessary.

It will be understood that where a series of hoops are arranged end to end, whether they enter each other (or "nest" together) or not, there is liability of a tendency to bulge upward sometimes, especially if the gang or series be a long one, and it will be seen that by the employment of one or more of the sliding followers I, the effect is virtually the same as to divide the gang up into sets so few in number, or so short, that this tendency and its attendant evils are effectually overcome.

By the combination, with the system of gears and screw-shafts, of the described lever the operative is enabled not only to exert the necessary leverage, but can so manage the lever, by moving it back a single tooth or two for a fresh hold every time, as to get the leverage in the most convenient position whenever the pressure demands the best application to be made of his strength.

It will be seen that, by the use of properly-located ways or skids *w w* within the box A, the operative is enabled to most expeditiously and conveniently put in and adjust in place the filled hoops, and slide them back and remove them after the pressing has been accomplished.

Of course, numerous changes in the details of construction may be made without departing from the spirit of my invention, and it will be understood that, though I have shown and described the several features of my invention

all embodied in one press, so as to gain the joint advantages of all of them, different parts of my invention may be used separately, with more or less advantage, under various circumstances.

At Fig. 4 the press shown is similar to that just fully described, except that in lieu of the long screw-shafts extending to and connected with the platen D, chains or cables E² and pulley-blocks P are used. This modification of the machine may be deemed advantageous or desirable sometimes, as it permits a more rapid running back, or immediate pushing back, of the platen D when it may be desired to put the latter hastily out of the way for the removal of the molded cheese and the hoops.

If deemed expedient, in either form of press alluded to, one or both of the screw-shafts, or the stud of the intermediate gear, may be formed with a projecting shank, adapted to fit into the socket of an ordinary crank-handle, which may be applied at pleasure, to run back the screws or platen D more expeditiously than the parts can be moved by the vibrating lever J.

I have designed my improved press more particularly for use in connection with, and have so far employed in it, that kind of cheese-hoop made the subject of Letters Patent to Samuel Wilson September 13, 1870, in which the parts of the hoop into which the curd is filled slide together, the bottom of one hoop serving as the follower to, or pressing on top of, the next hoop when a series or gang of the filled hoops is placed in the press; but it will be understood that my improved machine may be employed for the purposes of cheese pressing with a gang of any sort of hoop or curd-receptacles arranged in line end to end, as usual.

Having so fully explained the construction and operation of my improved press that any person skilled in the art can make and use it, what I claim therein as new, and desire to secure by Letters Patent, is—

1. A cheese-press adapted to receive and press a series of cheeses end to end, and having its holder-frame composed of or provided with a receptacle for the proper collection and discharge of all the expressed liquid, substantially as set forth.

2. In combination with a frame, or frame-work and suitable platens, between which to compress the interposed gang of cheeses, two or more drawing screw-shafts, or their equivalents, the whole arranged to operate substantially as set forth.

3. In combination with a press adapted to press a series of cheeses, with the hoops arranged end to end, one or more sliding holder-boards, I, or their equivalents, and means for holding said board or boards in place vertically, all substantially as and for the purposes described.

4. In combination with the box or body A of the press, suitable ways *ww*, or their equivalents, upon which to rest and slide the hoops in the operations of putting in, pressing, and removing the cheeses.

5. The combination, with a system of gears for operating a series of press screw-shafts, of a hand-lever and reversible pawl or finger, *j*, or its equivalent, the whole arranged to op-

erate substantially as described, for the purpose set forth.

In testimony whereof I have hereunto set my hand and seal this 2d day of June, 1876.

ARAD S. BEACH. [L. S.]

Witnesses:

S. N. JONES,

HIRAM G. MOE.