(No Model.) 2 Sheets—Sheet 1.

J. L. HELMER.

CHEESE PRESS.

No. 525,601. Patented Sept. 4, 1894.

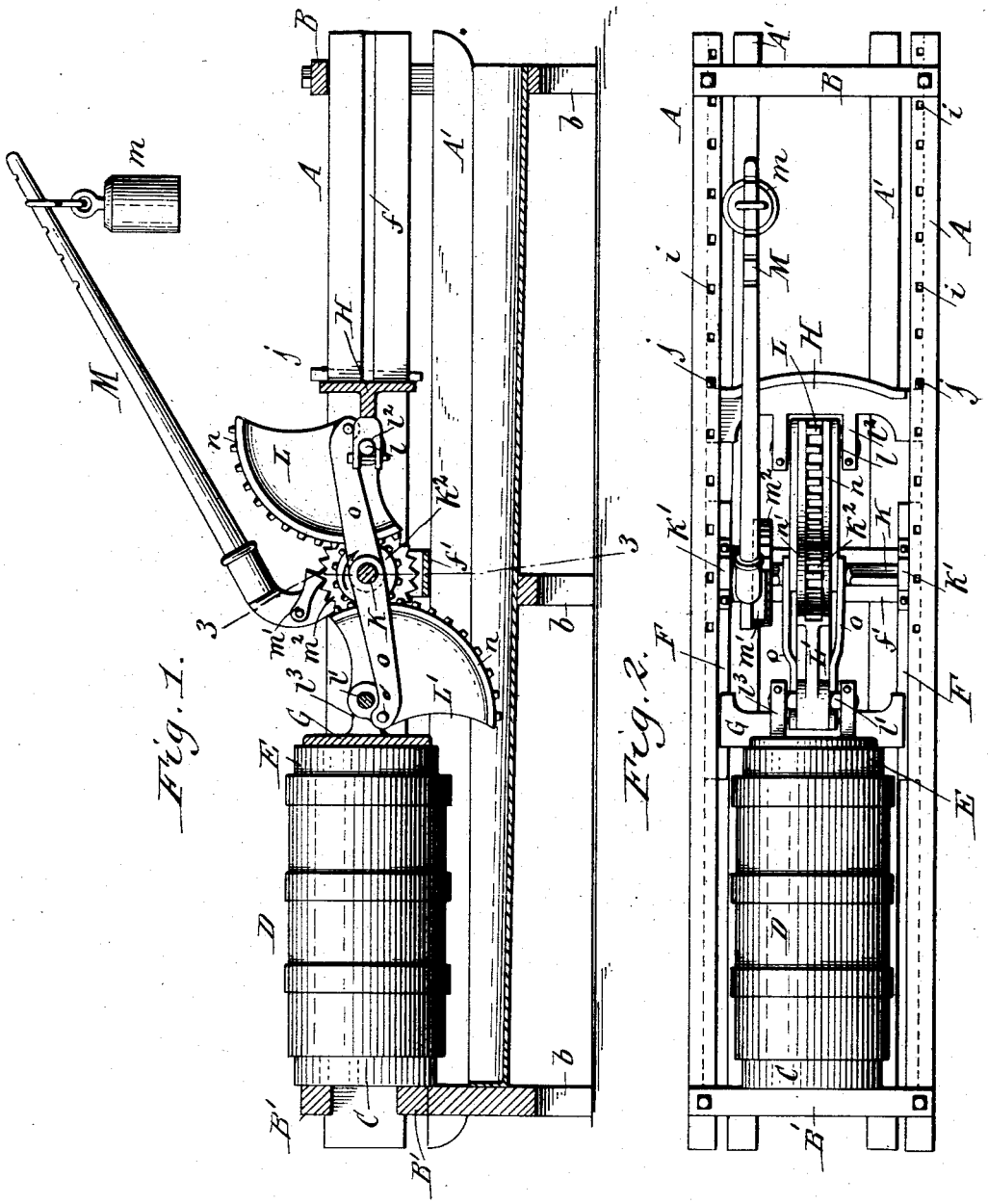

Fig. 1.

Fig. 2.

Witnesses:
Theo. L. Popp.
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James L. Helmer Inventor.
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(No Model.)

2 Sheets—Sheet 2.

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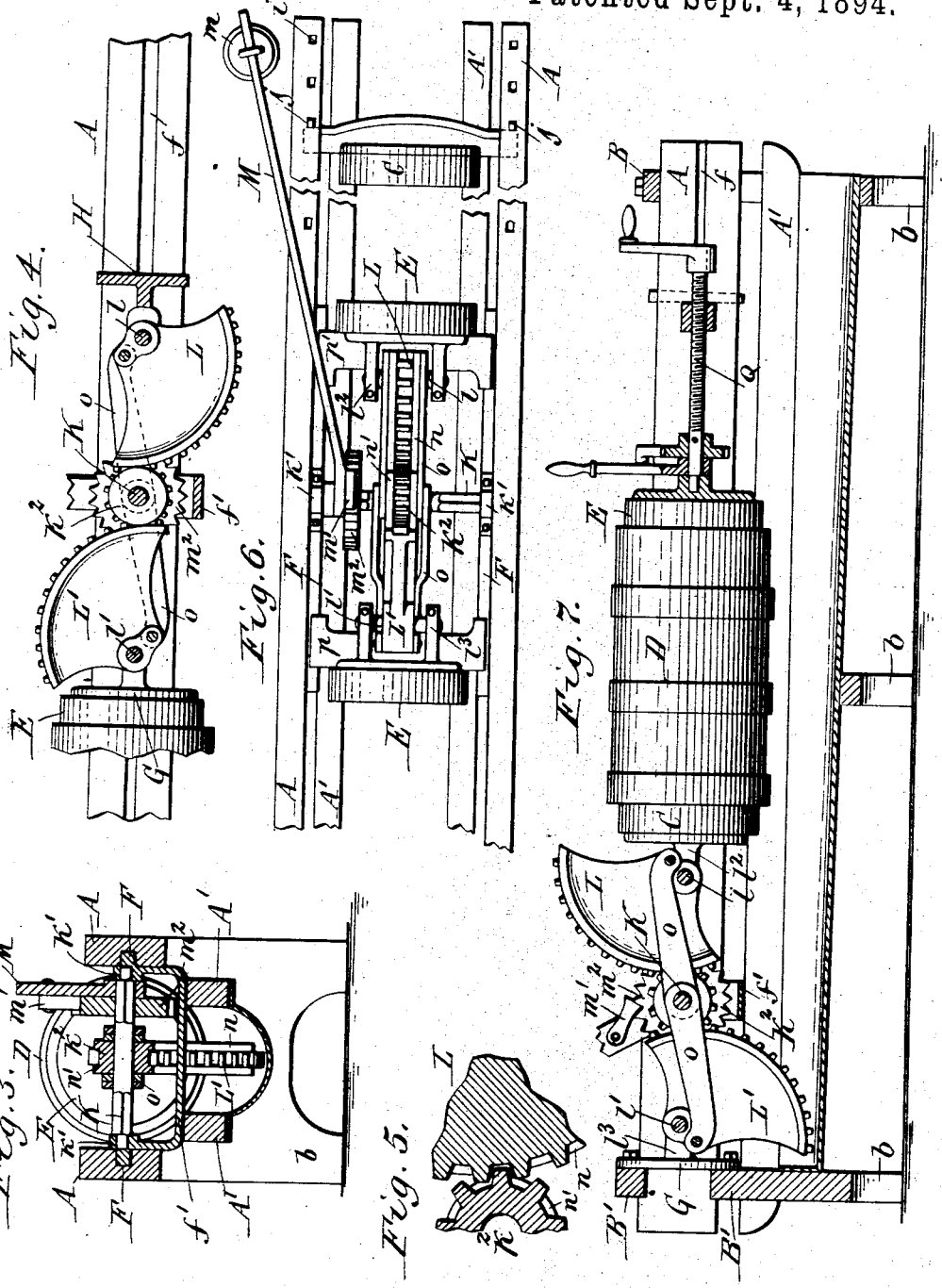

Fig. 4.

Fig. 6.

Fig. 7.

Fig. 3.

Fig. 5.

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Thos. L. Popp.
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UNITED STATES PATENT OFFICE.

JAMES L. HELMER, OF ROME, NEW YORK.

CHEESE-PRESS.

SPECIFICATION forming part of Letters Patent No. 525,601, dated September 4, 1894.

Application filed January 5, 1894. Serial No. 495,775. (No model.)

To all whom it may concern:

Be it known that I, JAMES L. HELMER, a resident of the city of Rome, in the county of Oneida and State of New York, have invented a new and useful Improvement in Cheese-Presses, of which the following is a specification.

This invention relates to that class of cheese presses which are provided with devices whereby the pressure is applied automatically, and has the object to produce an automatic mechanism which is very effective and whereby a constantly increasing pressure is applied to the cheeses.

In the accompanying drawings consisting of two sheets: Figure 1 is a longitudinal sectional elevation of my improved cheese press showing the parts in position for beginning the pressing operation. Fig. 2 is a top plan view thereof. Fig. 3 is a vertical cross section in line 3—3, Fig. 1. Fig. 4 is a fragmentary sectional elevation similar to Fig. 1, showing the parts in the position when the pressing operation has been completed. Fig. 5 is a fragmentary longitudinal section of the pinion and one of the eccentric segments. Fig. 6 is a fragmentary top plan view showing my invention adapted for pressing two gangs of cheeses. Fig. 7 is a vertical longitudinal section showing my invention used in connection with the usual hand screw for applying the preliminary pressure to the cheeses.

Like letters of reference indicate like parts in the several figures.

The press frame consists principally of two upper longitudinal beams A A, two lower longitudinal beams A′ A′, a cross bar B connecting the front portions of the upper beams, cross bars B′ connecting the rear portions of the upper beams, and legs *b* secured to the upper and lower beams.

C represents the foot block arranged between the rear portions of the upper beams and secured to the rear cross bars.

D represents a gang of cheese hoops of any suitable construction arranged between the upper beams and resting against the foot block.

E represents the movable head block arranged between the upper beams and bearing against the head end of the gang of cheeses.

F represents two sliding bars which are arranged in longitudinal grooves *f* formed in the inner sides of the upper beams and which are connected by a depressed cross bar *f′*, so that the sliding bars move together.

G represents a rear cross head which supports the head block and which slides with its ends on the sliding bars, so as to permit the head block to move lengthwise in the machine.

H represents a front cross head arranged with its ends in the grooves of the upper beams and capable of being adjusted lengthwise in the machine. The upper beams are each preferably provided for that purpose with a longitudinal row of openings *i* which intersect the guide grooves of the upper beams and which are adapted to receive pins *j* whereby the front cross head is held in its adjusted position.

K represents a main shaft arranged transversely between the front and rear cross heads and journaled with its ends in bearings *k′* formed in the sliding bars. The main shaft is provided centrally with a pinion k^2 which is rigidly secured thereto.

L L′ represent two eccentric gear segments which mesh with the front and rear sides of the pinion, respectively, and which are pivoted eccentrically on transverse shafts *l l′* journaled in bearings l^2 l^3 formed, respectively, on the front and rear cross heads. Upon turning the main shaft its pinion turns the eccentric segments in opposite directions.

M represents a weight lever whereby pressure is applied to the cheeses in the hoops. This lever is mounted on the main shaft and provided at its free end with a weight *m*. The lever is preferably mounted loosely on the shaft and connected therewith by a pawl *m′* pivoted upon the lever and engaging with a ratchet wheel m^2 secured to the main shaft.

Preparatory to beginning the pressing operation the segments are turned so that those portions of their peripheries which lie nearest their pivots engage with the pinion of the main shaft and the weight lever is raised, as shown in Fig. 1. Upon placing the weight upon the weight lever, when the parts are in this position, the pinion is turned in the direction of the arrow, Fig. 1, which causes the front segment to be moved downwardly and the rear segment to be moved upwardly. As the seg-

ments are turned on their pivots, the distance from the pivot of each segment to that portion of its periphery which is in engagement with the pinion gradually increases, thereby causing a thrust in opposite directions against the front and rear cross heads. As the front cross head is held stationary during the pressing operation, the rear or sliding cross head is caused to yield to the thrust of the segments and to move backward, thereby compressing the cheeses in the hoops. The main shaft and the sliding bars supporting the same are moved forward to the extent of the increase in the distance between the pivot of the front segment and the pinion, while the rear cross head is moved forward double the amount of movement of the main shaft, which causes the rear cross head to slide on the sliding bars while the latter are sliding in the upper beams.

The segments are preferably provided on both sides with marginal flanges n which bear against similar flanges n' on the pinion. These flanges are of such depth that the outer ends of the teeth of the pinion and segments are held out of engagement with each other, as represented in Fig. 5, thereby preventing the thrust of the segments from being exerted against the ends of the teeth. As the segments turn on their pivots their leverage gradually increases, owing to the gradually increasing distance from their pivots to the peripheral portions in engagement with the pinion, whereby the pressure upon the cheeses is gradually increased as the whey escapes and the cheeses become more dense. After the cheeses have been sufficiently compressed the movement of the pinion and the segments is reversed so as to remove the pressure from the cheeses.

In order to prevent the pinion and segments from separating during this reversal means are provided for keeping them in mesh, preferably of the following construction: o represents coupling bars arranged on opposite sides of each segment and each pivoted with one end on the main shaft and with the other end on a transverse pin o' arranged on the segment concentrically with its gear rim, which latter has the form of a circular arc. This concentric connection of the pinion shaft with the segments by the coupling bars preserves the proper relative position of the segments to the pinion and to each other. If it is necessary to continue the pressure on the cheeses after the segments have reached the limit of their forward movement, the segments are returned to their initial position, and the front cross head is adjusted forwardly in the upper beam and the operation of pressing is repeated.

In Fig. 6 my invention is shown as being adapted for pressing two gangs of cheeses. In this construction both cross heads p p' are movable on the sliding bars and move in opposite directions and two gangs of cheeses are arranged in the press frame, one on each side of the pinion shaft. The latter remains practically stationary, unless one gang becomes shorter than the other by pressure, when the shaft can adjust itself to the gangs.

My invention is also applicable to an ordinary cheese press in which a pressure screw Q is employed for moving the head block and effecting a preliminary pressing of the cheeses, while the automatic mechanism is used for effecting the final pressure. An arrangement suitable for this purpose is shown in Fig. 7. In this figure the front cross head is secured to the movable foot block and the rear cross head is secured to the rear cross bars of the main frame.

It is obvious that one of these segments can be omitted but it is desirable to employ two segments because an increased movement is thereby secured for compressing the cheeses. For instance when the pinion shaft in the construction represented in Fig. 6 is supported in stationary bearings, as it may be, the effect on each head block is only that of one of the segments.

I claim as my invention—

1. The combination with the press frame and the movable pressure block, of an eccentric segment having the form of an arc of a circle, a shaft provided with a pinion meshing with said segment, and a coupling bar mounted on said shaft and connected concentrically with said segment, substantially as set forth.

2. The combination with the press frame and the movable pressure block, of sliding bars arranged on said frame, a movable cross head sliding on said bars and supporting said block, a segment pivoted eccentrically on said cross head, a transverse shaft journaled in bearings arranged on said bars and provided with a pinion meshing with said segment, and a pressure device connected with said shaft, substantially as set forth.

3. The combination with the press frame and the movable pressure block, of sliding bars arranged in the press frame, a movable rear cross head arranged to slide on said bars and supporting the pressure block, a front cross head adjustably secured to the press frame, a transverse shaft arranged between the front and rear cross heads and journaled in bearings arranged on said bars, a pinion secured to the transverse shaft, segments pivoted eccentrically to the front and rear cross heads and meshing with the pinion, and a weight lever connected with the transverse shaft, substantially as set forth.

Witness my hand this 2d day of January, 1894.

JAMES L. HELMER.

Witnesses:
W. S. NIENE,
WILLIS W. BYAM.