

(No Model.)

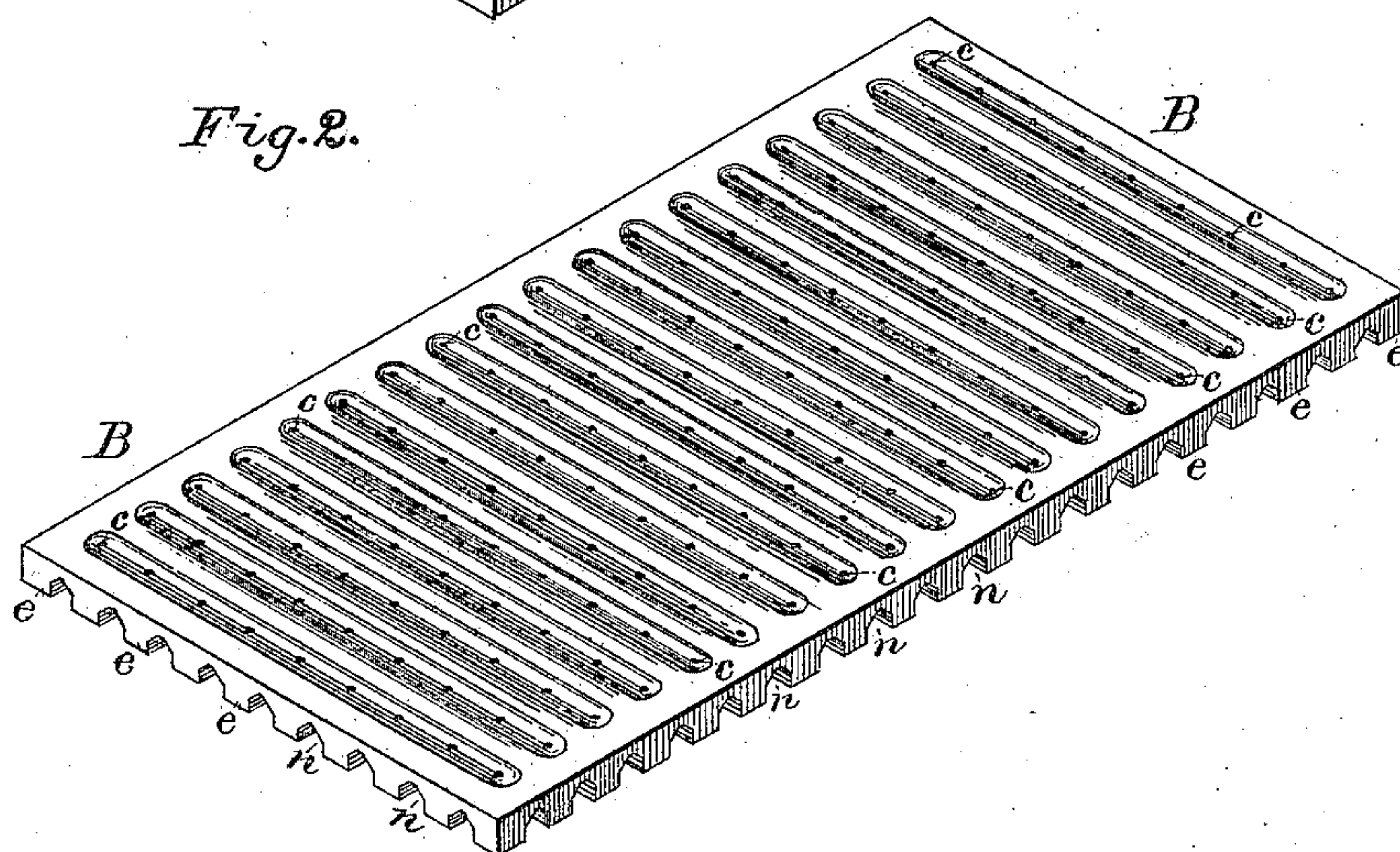
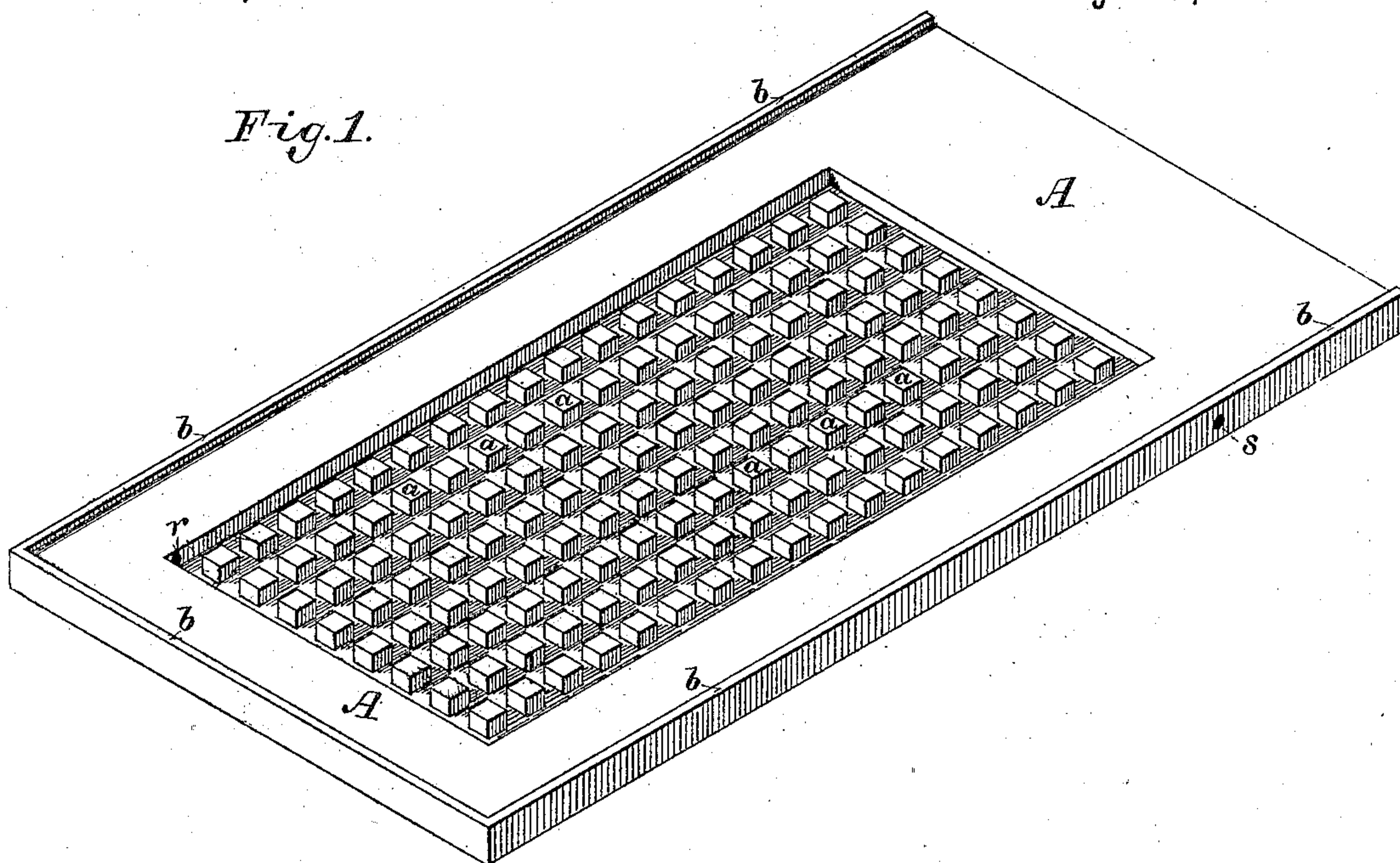
3 Sheets—Sheet 1.

C. S. HAMILTON.

OIL PRESS MAT.

No. 298,848.

Patented May 20, 1884.



Witnesses:
W. H. Bottom
Chas. R. Goss.

Inventor,
C. S. Hamilton

(No Model.)

3 Sheets—Sheet 2.

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Fig. 3.

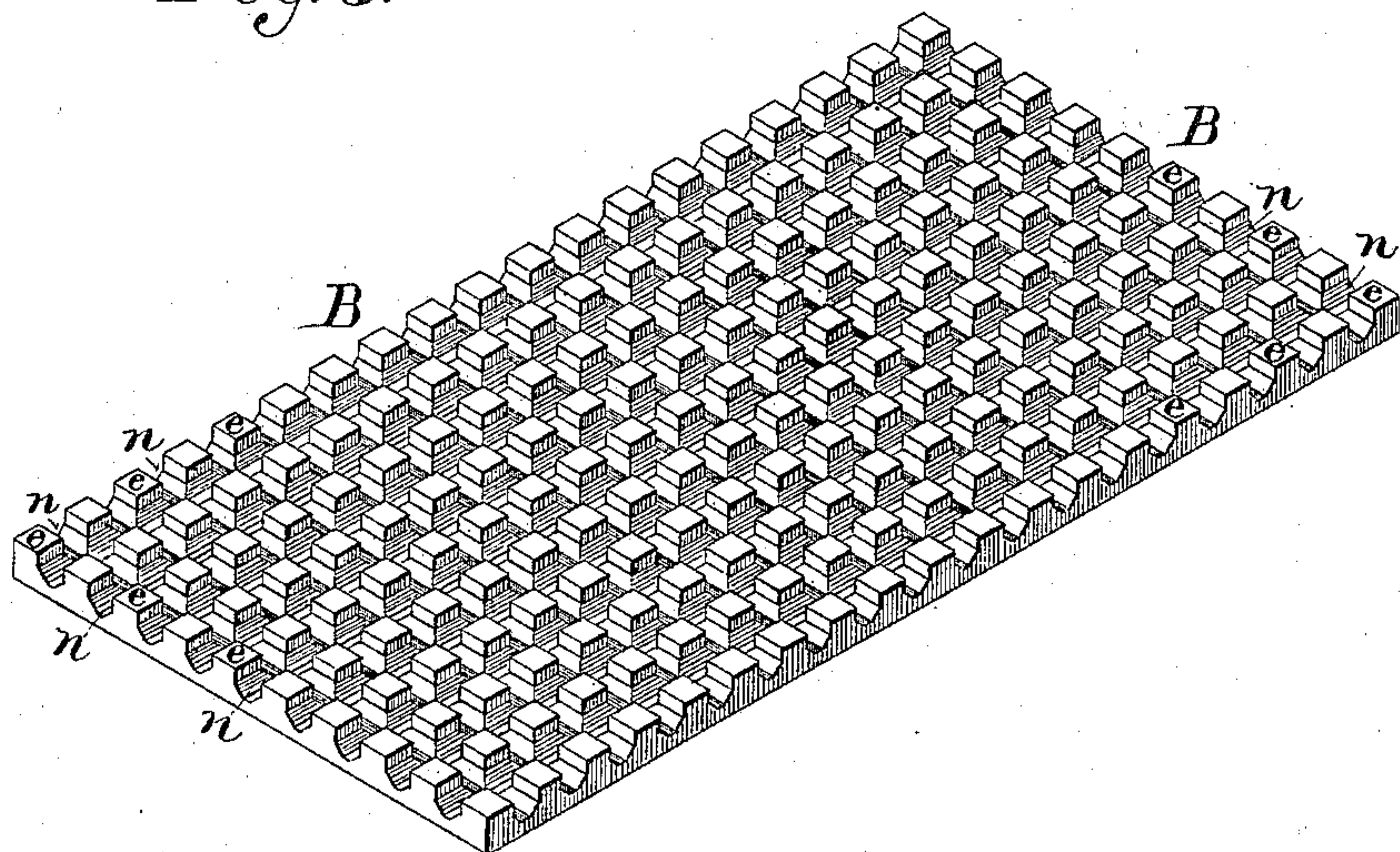
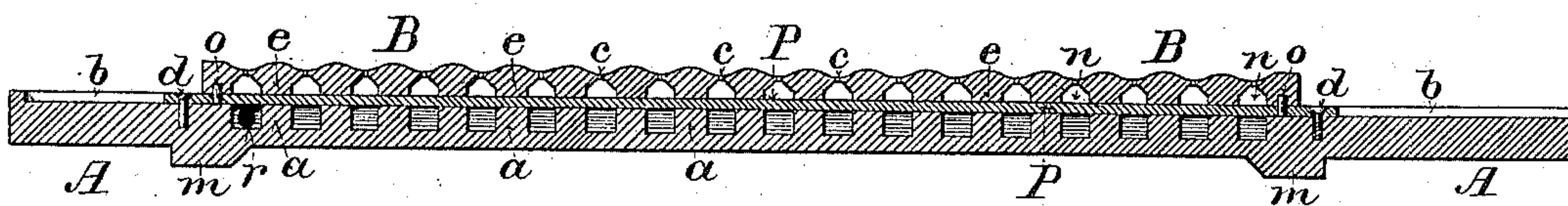


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES S. HAMILTON, OF MILWAUKEE, WISCONSIN.

OIL-PRESS MAT.

SPECIFICATION forming part of Letters Patent No. 298,848, dated May 20, 1884.

Application filed November 21, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. HAMILTON, a citizen of the United States, of the city and county of Milwaukee, and State of Wisconsin, have invented certain new and useful Improvements in Oil-Press Mats; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to that class of oil-press mats which are made of metal and are employed in the manufacture of oil from oil-bearing seeds by hydraulic pressure.

It consists, essentially, of a mat composed of metallic plates provided with channels or grooves for carrying off the expressed oil, and with chambers or passages for the reception of hot air or steam, whereby the mat may be quickly and uniformly heated, together with a peculiar device for connecting the mat with the heating-reservoir. Its objects are, first, to increase the working capacity of the presses; second, to increase the quantity of oil which can be extracted from a given amount of seed; third, to improve the quality of the oil; fourth, to do away with expensive hair mats; fifth, a method of heating the mats throughout quickly and uniformly; sixth, a more perfect drainage for the expressed oil; and, seventh, a mat which may be more readily and effectually cleaned whenever it becomes clogged by use. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the upper face of the lower or main plate of the mat. Fig. 2 is a like view of the upper face of the cap-plate. Fig. 3 is a similar view of the reverse or under face of the cap-plate. Fig. 4 is a vertical longitudinal section of the mat complete. Fig. 5 is a plan view of one of the mats with its heating-connections, showing the pillars of a press in horizontal section on the line *x x*, Fig. 6; and Fig. 6 is a side elevation of a portion of a hydraulic press, showing the arrangement and operation of the oil-mats therein and the method of connecting the same with the heating-reservoir.

A represents the lower or main plate, so excavated on its upper face into longitudinal and transverse grooves as to leave supporting squares or pillars *a a* equidistant from each other, and sufficient to sustain the whole hydraulic pressure applied thereto, and to prevent the flexure or warping of the plate. The area thus excavated into grooves and squares is equal to that of the meal form to be pressed. The lower face of said plate A may be corrugated to give an undulating surface to the cake, or it may be made plane, as shown in Fig. 4, in which case strips *m m*, beveled on the inner sides, should be raised thereon to prevent the meal from escaping when under pressure. I prefer to make the plate A of wrought-iron, about five-eighths of an inch thick, with excavations of about three-eighths of an inch in depth. A second plate or partition, P, of the same material, (about one-eighth of an inch thick) is placed upon the upper face of plate A, over the excavated portion thereof, and is fastened thereto by means of rivets or screws *d d* with countersunk heads, as shown in Fig. 4, thereby forming a closed chamber or passage, through which steam or hot air is caused to circulate. The partition-plate P is made of sufficient size to extend on each side beyond said chamber and the cap-plate B. Two passages, *r* and *s*, opening on opposite sides of plate A, communicate with diagonally-opposite corners of said chamber.

B represents the cap or drainage-plate formed on its upper face with transverse corrugations, as shown in Figs. 2 and 5, and having transverse and longitudinal grooves or channels *n n* cut into its lower face, so as to leave the supporting-squares *e e*, as shown in Fig. 3, which exactly correspond when in position with the grooves and squares in the lower plate, A, the squares *e e* of the upper plate resting directly over the squares *a a* of the lower plate, as shown in Fig. 4, thus giving an equal and effective support throughout that portion of the mat subjected to pressure. The grooves *n n* are cut the entire length and breadth of the plate B, and of such a depth as to leave about one-thirty-second of an inch between their apexes and the center lines of the valleys of the corrugations on the upper face of the plate. These grooves, for about one-half of their depth, have parallel vertical sides; but for

the remaining part of their depth are cut in the form of an arch, or with converging sides, as seen in the drawings. The transverse grooves *n n* lie directly underneath and parallel with the valleys of the corrugations, and along the center lines of these valleys, at the intersection of the grooves *n n*, and at intermediate points, if desired, the plate B is pierced with small perforations *c c*, about one-sixteenth of an inch in diameter, through which the oil freely escapes into the grooves or channels *n n*, immediately below, thence over the partition-plate P to suitable channels in the lower plate, A, which conduct it away and discharge the same from the mat at its lower end. The cap or drainage-plate B is preferably made about one-half inch in thickness, and about two inches longer and wider than the heating-chamber of the lower plate, A, to allow of sufficient face outside of the corrugations to prevent the cutting of the press-cloths when the mats are under pressure, and to leave room outside of the plate B for the rivets or screws *d d*, by which the partition-plate P is secured to the lower plate, A. The cap or drainage-plate B, resting loosely upon the partition-plate P, is held in position by small dowel-pins *o o* in the corners, as seen in Fig. 4, and can be readily removed and freed from accumulations by a slight tap.

The plates A, B, and P combined, as described and shown in Fig. 4, form a single mat of homogeneous material about one and one-fourth inch thick, readily heated, capable of resisting as great a degree of pressure as an equal thickness of solid iron, and furnishing a perfect drainage directly down through all parts of the superposed cake. A number of these mats are suspended one above another in the usual way in the hydraulic press, and are each provided with lugs or ears *p p*, by which they are guided upon the pillars N N of the press. The entire press is slightly inclined, as shown in Fig. 6, to give a gentle downward pitch to the mats from front to rear, whereby the oil is caused to flow toward the rear ends of the mats, and the condensed steam is drained off in the heating-chambers through the passages *s s* and discharge-pipes *t t*, secured therein.

g g are small pipes secured in the openings *r r* in the plates A A, near the front end of each mat, and provided with stop-cocks *k k*, by means of which the steam or heated air may be admitted into the heating-chambers of each mat, as desired. These pipes extend a little beyond the pillar N of the press, and are provided at the ends with elbows and nipples for the attachment of the rubber hose or tubing *l l*, by means of which they are connected with nipples *h*, projecting from an upright supply-pipe, L, located near the rear of the press, and connected with the steam or hot-air generator. Since the mats travel a considerable distance up and down when pressure is applied or removed, a flexible connection between the mats and the supply-pipe L

becomes necessary, in order to allow for this movement, which increases in extent from the top of the press downward. Each hose-pipe *l* is attached to the supply-pipe L midway between the upper and lower position of the mat with which it is connected, as shown by the lower mat in Fig. 6, and is of sufficient length to allow for the travel of the mat without injury to the hose by bending the same where it is attached to the nipples on pipes *g* and L. By this arrangement the hose-pipes *l l* will last much longer than where the supply-pipe L is placed near the point of attachment to the mats, and the connecting-hose, owing to its short length, soon becomes weakened and broken by the constant abrupt bending caused by the travel of the mats.

In operation the advantages of my improved mat, with its connections, over all others in use may be briefly stated as follows:

First. An increase in the capacity of the press of from twenty to thirty-three per cent., since where fifteen cakes are made at one pressing with hair mats, eighteen or twenty cakes of the same size and weight may be made by the employment of my improved metallic mats.

Second. The abolition of hair mats, saving a large first cost and a large yearly expense for renewal. Hair mats cost about nine dollars each, involving a first cost for each fifteen-plate press of two hundred and seventy dollars, while the average yearly expense of renewal is equal to one-half of the first cost.

Third. A greater yield of oil from any given amount of seed. With hair mats, oil extracted from the center of the cake must find its way through the hardening meal one-half the width of the cake (from five to six inches) to the edges thereof, where it finds its only exit or escape. Meanwhile, from the time the meal is placed between the mats the oil is cooling; whereas with my improved metallic mats and heating apparatus the meal and oil are constantly becoming hotter until the pressure is removed, and the heated oil, being thin, finds its exit more readily, and is consequently expressed more rapidly. It has, too, only to find its way through the thickness of the cake (from one-half to three-fourths of an inch) to its exits. It follows, therefore, that the percentage of oil obtained from a given amount of seed in a given time by the use of my improved mats is, owing to the constant and uniform heat applied to the entire cake and the easy means of escape for the expressed oil, greater than can be secured by any other means heretofore employed.

Fourth. The quality of the oil delivered from a hot mat, as well as the condition of the cake, is materially improved. The oil escapes from the mat at a temperature of nearly 200° Fahrenheit, and in this thin state deposits its sediment with great rapidity, and becomes limpid and ready for packing in a fraction of the time required when expressed from a cold mat. The cake, also, when taken from the

press, contains sufficient heat to dry it while cooling, and is in proper condition for packing as soon as cold. The lower face of the plate A, as hereinbefore stated, may be either
 5 corrugated or plane. I consider the plane face preferable. The only object of corrugations is to produce upon the cakes corrugated faces, which allow the circulation of air between the same and prevent the absorption
 10 of moisture when they are packed for market. When both faces are corrugated, the corrugations being uniform in length, breadth, and depth, it follows that when the cakes are packed the ridges of each cake will fit into the val-
 15 leys of those next to it, thereby forming a contact of surfaces. With one corrugated and one plane face when packed for market, the plane face of each cake is placed against the corrugated face of that next to it, thereby prevent-
 20 ing contact of surfaces and permitting a free circulation of air between the cakes. By the exercise of a little care in packing, this arrangement need not be departed from.

I do not wish to confine myself to the exact
 25 construction of the plates hereinbefore described, since the details of construction may be varied without departure from the spirit of my invention.

What I claim as new, and desire to secure
 30 by Letters Patent, is—

1. The combination, in an oil-press mat, of a metallic plate, A, so excavated on its upper face as to leave at uniform distances from each other, supporting-columns—as *a a*—and of a
 35 thin plate, P, secured to said plate A over the excavated portion thereof, thereby forming between the two plates a steam-tight chamber for the reception and circulation of a heating medium, substantially as and for the purposes
 40 set forth.

2. The combination of the plates A and P, inclosing between them a heating-chamber with supporting-columns for resisting pressure, substantially as and for the purposes set
 45 forth.

3. The combination, with the perforated plate B, having drainage-grooves, of the partition-plate P and excavated plate A, substantially as and for the purposes set forth.

4. The combination, with an oil-press mat, 50 when the same is provided with a heating-chamber, of a flexible hose, as *l*, connecting said chamber with the heat-reservoir, whereby heat is continuously admitted to the mat without interference with its vertical movement, 55 substantially as and for the purposes set forth.

5. The method of heating oil-press mats, consisting in passing the heating medium from its supply-reservoir to the plates to be heated through a flexible conduit, and permitting 60 said heating medium to enter and escape at diagonally-opposite corners of the heating-chambers in said mats, substantially as and for the purposes set forth.

6. The combination, in an oil-press mat, of 65 the plate A, having a plane lower surface, upon which are raised strips *m m*, to prevent the spreading of the meal form beyond proper limits when the same is under pressure, and the cap-plate B, having a corrugated upper 70 face, whereby a meal cake is produced, having one plane and one corrugated face, substantially as and for the purposes set forth.

7. The combination, in an oil-press mat, of the removable perforated cap-plate B, pro- 75 vided on its under face with the drainage-grooves, and the plate A, provided with a heating-chamber formed in its upper face, together with a thin plane partition-plate, P, inserted between said plates A and B, substan- 80 tially as and for the purposes set forth.

8. The combination, in an oil-press mat provided with a heating-chamber, of the inlet-pipe *g*, provided with cock *k*, the supply-pipe L, located near the opposite end of the press, 85 and the flexible hose *l*, connecting said pipe *g* and pipe L, substantially as and for the purposes set forth.

9. In an oil-press mat, a perforated cap-plate, B, having a corrugated upper face and 90 drainage-grooves cut into its lower face, substantially as and for the purposes set forth.

C. S. HAMILTON.

Witnesses:

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 LOUIS H. HAMILTON.