

No. 649,503.

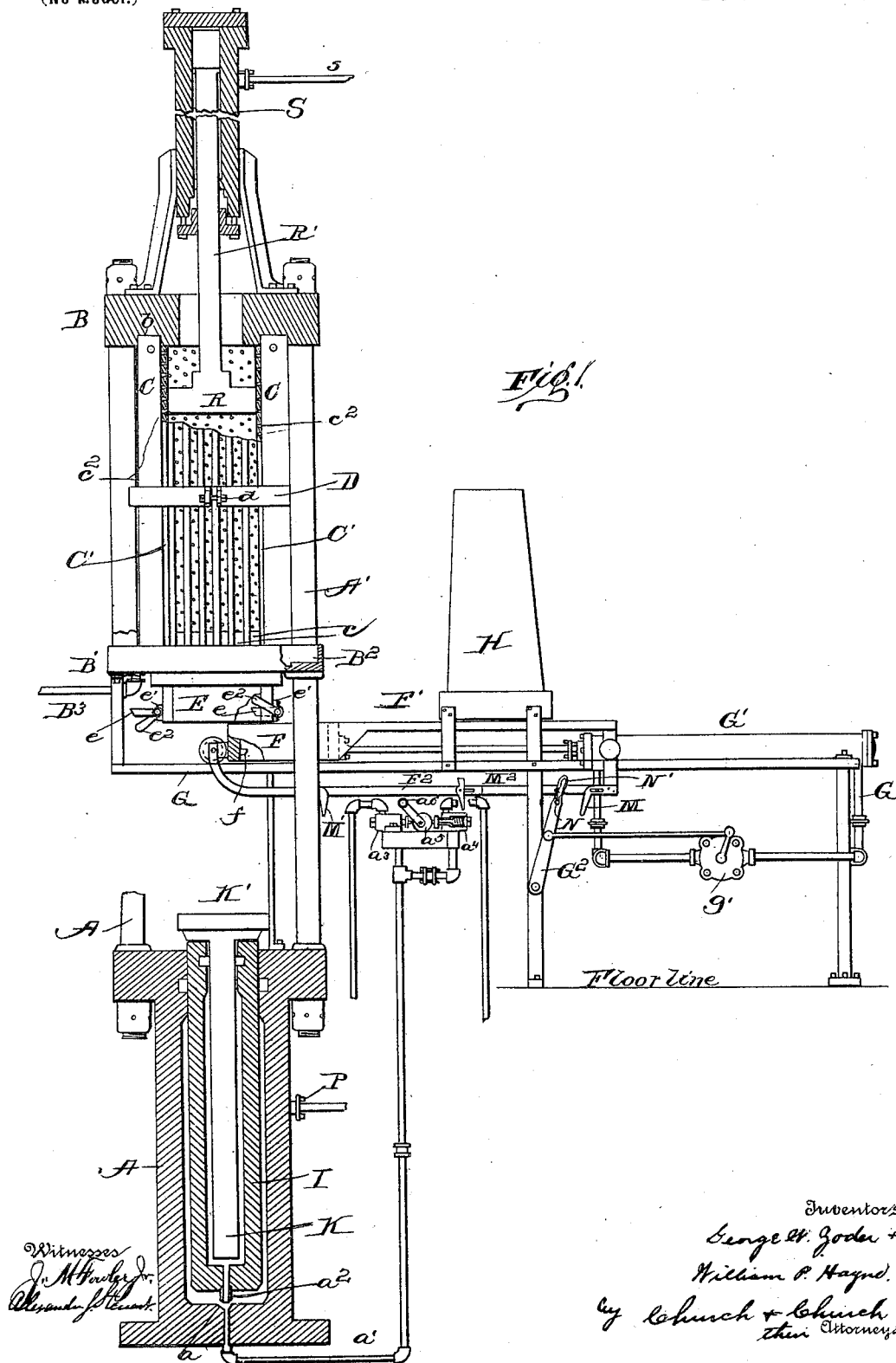
Patented May 15, 1900.

G. W. ZODER & W. P. HAYNE.
PRESS FOR OLEAGINOUS SUBSTANCES.

(Application filed Aug. 31, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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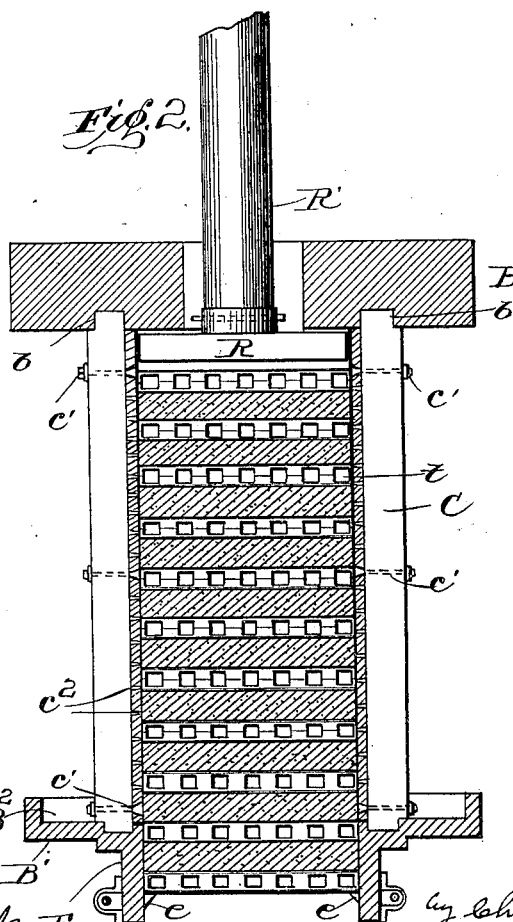
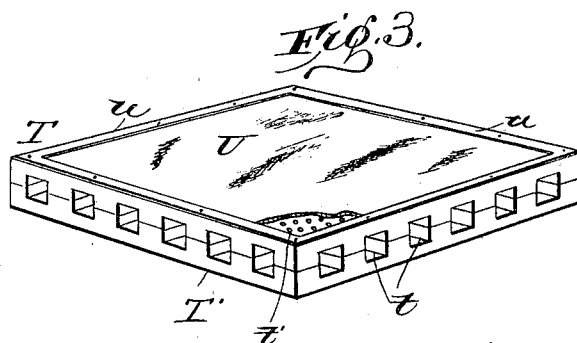
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2 Sheets—Sheet 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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PRESS FOR OLEAGINOUS SUBSTANCES.

SPECIFICATION forming part of Letters Patent No. 649,503, dated May 15, 1900.

Application filed August 31, 1899. Serial No. 729,117. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. ZODER, of Alexandria, and WILLIAM P. HAYNE, of Boyce, in the parish of Rapides and State of Louisiana, have invented certain new and useful Improvements in Presses for Oleaginous Substances; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in presses designed particularly for expressing oil from cotton-seed meal and similar substances—such, for instance, as flaxseed or linseed—one of the objects of the invention being to facilitate the handling of the substance from which the oil is expressed not only prior and subsequent to the actual pressing operation, but during the actual pressing operation, whereby a greater quantity may be pressed at each operation and whereby a saving in time, labor, and materials (particularly the destructible elements—*i. e.*, the haircloth or mats) is effected.

A further object of the invention is to avoid any unnecessary waste or cooling of the material prior to the pressing operation and to provide for a more thorough and uniform compression of the cake, particularly the edges or marginal portions thereof.

The invention consists in certain novel details of construction and combinations and arrangements of parts, all as will be now described, and pointed out particularly in the appended claims.

Referring to the accompanying drawings, Figure 1 is a vertical section, partly in elevation and partly diagrammatic, of a plant embodying our present improvements designed particularly for pressing cotton-seed meal. Fig. 2 is a detail vertical section through the press-box. Fig. 3 is a detail perspective view of one of the division-plates.

Like letters of reference indicate the same parts in all the figures.

Power for the pressing operation in the present apparatus, like other and well-known apparatus of similar character, is preferably derived from a hydraulic press, having a ram

working into the press box or chamber, and by reference to Fig. 1 it will be seen that the letter A indicates the cylinder of the hydraulic press, arranged vertically and having above it a press-chamber supported by uprights A', connected at their lower ends with the upper end of the cylinder A and at their upper ends passing through and supporting horizontal frames B B', between which the press-box proper is mounted. The frames B B' are preferably heavy metallic frames made substantially rectangular, the lower one, B', having a central aperture of substantially the same or slightly larger diameter than the mouth of the press-box, and both frames have recesses *b* in their adjacent faces for the reception of vertical bars C, arranged edgewise in said recess and constituting the retaining-walls of the press-box. These vertical bars C are preferably of metal and are spaced apart by blocks *c* at top and bottom a sufficient distance to form oil-channels, through which the oil from the material compressed in the press-box may escape and flow downwardly. The press-box is preferably lined with metal plates C', secured to the bars C by countersunk bolts *c'*, said plates C' being, however, provided with vertically-arranged rows of perforations or apertures *c*², corresponding in location to the spaces or oil-channels between the bars C. The said perforations *c*² are perfectly conical or tapered, with the smaller openings toward the interior of the press-chamber. Thus they will readily clear themselves of any obstructions which may enter through their smaller ends, and at the same time the danger of meal or the oleaginous substance escaping is reduced to the minimum. To prevent any possible bulging or springing of the walls of the press-chamber at the center, the chamber at this point is preferably encircled by a confining band or tie D, which may be provided with means, such as a bolt *d*, for adjusting its tension, if so desired. The bottom frame B' of the press-chamber is preferably formed with a channel B², extending around the base of the press-chamber and constituting a trough for catching the oil running down in the channels between the bars C, which oil may be conducted away through a pipe D³ to any

suitable receiver. (Not shown.) In operation the oleaginous substance is adapted to be fed into the lower end of the press-box, and the pressure for expressing the oil is supplied through an upwardly-working ram, and in order to facilitate the feeding of the substance to the press-box and the pressing of the same therein the lower end of the press-box is preferably located a short distance above the floor-level and provided with a downward extension or receiving projection E, adapted to register with a charging-box or traveler F, supported in a frame or carrier F², running on tracks G, extending in a horizontal direction or transversely of the line of the press-chamber. This traverser or charging-box is adapted to be reciprocated back and forth on the tracks G by means of a piston working in a power cylinder G', to which pressure may be admitted through pipe g from a valve g', controlled by a lever G², so as to admit pressure to one or the other of the ends of said cylinder or to cut off the pressure to both of said ends and thereby arrest the movement of the charging-box. As before stated, the charging-box F is adapted to register with the press-chamber, and when at the opposite extreme of its movement it is adapted to register with the lower end of a hopper H for containing the bulk of oleaginous substance, and during the travel of the charging-box the lower end of the hopper is closed or the oleaginous substance prevented from escaping therefrom by a flat plate or table F', attached to and adapted to move in unison with the said box and of sufficient length to allow the charging-box to move from the hopper to the press-case. Within the charging-box brackets or supports f are formed, upon which suitable division-plates or partitions may be placed, such partitions conforming in size to the internal size of the charging-box and press-chamber, respectively, and within the lower end of the press-chamber yielding retainers or supports e are provided. In the preferred construction these retainers are in the form of pivoted pawls mounted in bearings e' and adapted to be controlled by handles e², whereby they may be thrown into or out of operative position, as shown in Fig. 1, on the right and left hand sides, respectively. From the foregoing it will be seen that when the charging-box F is moved into position beneath the hopper after one of the partitions have been placed in the said box it will be filled with the oleaginous substance, and when it is advanced to a position beneath the press-chamber and in registry therewith the said partition may be pushed upwardly, carrying with it the charge of oleaginous substance, and will be retained within the lower end of the press-chamber by the retainers e, and with a view to performing the feeding or charging operations as near as may be automatically and with little or no effort on the part of the attendant we provide a means whereby the charging-box will be arrested automatically

when in position beneath the hopper or when in position beneath the press-chamber or when in an intermediate position where a partition may be inserted, and we further provide a relatively-light charging press and ram which may be operated quickly for pushing each of the charges in succession upwardly into the press-chamber. These mechanisms are shown in Fig. 1, and by reference to this figure it will be seen that in the cylinder A a ram or plunger I is provided, and the said ram I constitutes a cylinder in which a similar and centrally-arranged ram K is adapted to work, and upon the upper end of the latter is mounted the movable platen K' for performing the charging and pressing operation. The ram I in its movements is adapted to establish the connection with the pressure-supply pipe for operating the inner ram K, and in the preferred construction in order to accomplish this result the lower end of the cylinder A is provided with a valve-seat a in communication with a pressure-supply pipe a', and the ram I is provided with a tubular plug a², having a conical end adapted to seat in the seat a when the ram I is at the lowermost extreme of its movements, thereby putting the pipe a' into direct communication with the internal cylinder for the ram K. The pipe a' has branches extending to pressure and discharge through pressure and discharge valves a³ a⁴, respectively, and these valves are controlled by a cam a⁵, having a handle a⁶ or similar contrivance for enabling them to be manually controlled with certainty and with a minimum of labor on the part of the attendant. With this arrangement pressure may be admitted to the inner cylinder for operating the charging plunger or ram when the charging-box is in proper position beneath the press-chamber, and the attendant having hold of the handle a⁶ can control said plunger with rapidity and ease. The valve g' for controlling the admission and exhausting of the pressure to the charging-box operating cylinder G' is of any ordinary type, with the ports and passages so arranged as that when the lever G² is in an intermediate position of adjustment the charging-box will be arrested in its movement, and when in the arrangement shown the lever is thrown to the left-hand extremity of its movement pressure will be admitted to the inner end of the cylinder for withdrawing the charging-box from its advanced position beneath the press-chamber, and when said lever is at the right-hand extreme of its movement pressure will be admitted to the outer end of the cylinder G' for advancing the charging-box into its position beneath the press-chamber, and in order to arrest the charging-box at the three positions before indicated the frame F' is provided with two adjustable but relatively-fixed stops M M' and intermediate adjustable pivoted stop M², all of which stops are adapted to cooperate with the lever G² to move it into its intermediate position. In the preferred construction

tion and in order to release said lever from its engagement with the said stops it is provided with a pin N, with which the stops contact, and a controlling-handle N' for said pin, which
5 may be manually operated for withdrawing the pin out of contact with the stops.

In operation now, assuming that the hopper H is filled with the heated oleaginous substance from which the oil is to be expressed
10 and the charging-box F is at an intermediate position between the press-case and hopper, a partition O is dropped into the charging-box by the attendant and the handle or lever G² moved to the left. This will admit pressure
15 to the cylinder G', causing the charging-box to move back beneath the hopper H and bringing the stop M' into contact with the pin N, whereby the said lever G² is again returned to its intermediate position and the
20 charging-box arrested in its movement when it has reached a position directly beneath the hopper. The charging-box having been filled, the lever G² is drawn back to the right, thereby causing the charging-box to advance into
25 position beneath the press-chamber, and during its travel the intermediate stop M² will ride over the pin N; but the stop M will contact with said pin and return the lever to its intermediate position just as the charging-
30 box registers with the press-chamber. The attendant noting that the charging-box has reached its position then operates the valve for admitting pressure to the charging-cylinder, causing the plunger K to rise and force
35 the partition, with the charge of oleaginous material, up into the press-chamber. This having been accomplished and the charging-plunger again dropped to normal position, the attendant moves the lever G² to the left,
40 starting the charging-box on its return movement. This movement will continue until the pivoted stop M² contacts with the pin N on the lever G² and moves the lever back to its upright position, thereby arresting the
45 charging-box at an intermediate point in its travel or at a point between the hopper and press-chamber. The attendant may then insert another partition, and freeing the lever G² from the stop M² by withdrawing the pin
50 N he moves the said lever to the right again, when the same sequence of operations before described is performed. The press-chamber having been filled with the charges of oleaginous material and intermediate partitions,
55 the charging-box is allowed to remain retracted and pressure is admitted to the cylinder A through a pressure-supply pipe P, thereby advancing the ram I and plunger K with a power proportionate to the diameter
60 of the ram and pressure supplied through the pipe P to express the oil from the substance contained in the chamber. The oil trickling down into the trough B² is, as before stated, carried off to any suitable receiver through
65 the pipe B³. The pressing operations having been completed, the ram I is allowed to drop to its normal position, and the oil-cake is dis-

charged from the press-chamber, preferably by a downwardly-acting platen R, which forms the fixed abutment during the pressing
70 operation and which is attached to a ram R', working in a cylinder S, arranged above the press-chamber, but adapted to receive pressure through a supply-pipe s.

In order to facilitate the discharge of the
75 oil-cake and partitions, the press-chamber is preferably made slightly tapering—that is to say, of slightly-larger internal diameter at the bottom than at the top—and during the
80 discharging period the pawls or retainers e are preferably turned out, as indicated at the left-hand side in Fig. 1, so as to prevent any possible interference with the partitions or oil-cake.

The partitions or division-plates are em-
85 ployed between the successive charges of oleaginous substance in order to equalize the pressure thereon and to express the oil from the edges as well as the central portion, and in the preferred construction they are sub-
90 stantially rigid and are formed with oil-channels extending away through from side to side of the press-chamber and registering with the lines of apertures c² in the side walls
95 of the press-chamber. In forming these partitions or division-plates we prefer to form them in sections T T', in the adjacent or meeting
100 faces of which sections channels or grooves t are formed by planing or otherwise, and when the sections are secured together these
105 channels t register and form passages opening out at the edges of the partition or division-plate. For admitting the oil to the chan-
110 nels t each of the sections is provided with a series of apertures t', preferably flaring or enlarging toward the center, similar to the apertures c² in the lining of the press-chamber, and in order still further to exclude the oleaginous substance from the passages t each
115 face of the plate is covered with haircloth or like material U, which may be retained in place by marginal strips u, fastened to the plates by screws or similar fastenings. The haircloth being drawn over a flat surface is held straight and there is comparatively little strain thereon. Consequently its life is much prolonged, and the usual expense incident to renewing the mats in expressing operations is avoided.

The partitions or division-plates, it will be
120 understood, are preferably employed with relatively-small charges of material between them, and consequently the press-chamber may be made very much longer than heretofore, so as to accommodate a much larger
125 quantity of material, and at the same time the whole bulk of material will be subjected to a uniform and effective pressure for the extraction of the oil.

Obviously any of the usual forms of valve
130 mechanism for controlling the admission of pressure to the pipes P and S may be used, and such devices forming no part of the present invention are not illustrated herein, nor

is it essential that hydraulic pressure be employed, inasmuch as it is obvious that any liquid or vapor pressure may be utilized with the mechanism illustrated.

5 Having thus described our invention and in what manner the same is to be performed, we declare that what we claim as new, and desire to secure by Letters Patent, is—

1. In an oil-press the combination with the
10 press-chamber, and hydraulic press arranged in line therewith, of a transversely-movable charging-box having a diameter coextensive with the diameter of the press-chamber, working between the press-chamber and hydraulic
15 press and adapted to register with said press-chamber when in one position of adjustment for permitting the passage of the press-platen to force its contents into said chamber and a hopper with which said charging-box registers when in a different position of adjustment, for filling; substantially as described.

2. In an oil-press the combination with a
20 press-chamber, and a hydraulic press arranged in line therewith, of a transversely-movable charging-box working between the press-chamber and hydraulic press and having a diameter coextensive with the diameter of and adapted to register with said press-chamber to permit the passage of the press-platen, a hopper with which said charging-box is also adapted to register, and a cut-off or plate moved by the charging-box for closing the hopper when the charging-box is out of registry therewith; substantially as described.

3. In an oil-press, the combination with the press-chamber, the hydraulic press arranged in line therewith and means for supplying pressure to said hydraulic press, of a transversely-movable charging-box having a diameter coextensive with the press-chamber mounted in ways and moving between the press-chamber and hydraulic press and permitting the passage of the press-platen when
45 in registry with the chamber; substantially as described.

4. In an oil-press, the combination with the press-chamber having its receiving end downward, the vertically-arranged upwardly-working hydraulic press beneath said press-chamber and means for supplying pressure thereto, of the horizontally-movable charging-box traveling between said press-chamber and hydraulic press so as to register with the press-chamber and a hopper for supplying material to said charging-box; substantially as described.

5. In a hydraulic press, the combination with the vertically-arranged press-chamber
60 having its receiving end downward and hydraulic press in alinement with and below the same, of the horizontally-movable charging-box working between the press-chamber and press having an opening therethrough of greater diameter than the press-platen and a pressure cylinder or motor for advancing and

retracting said charging-box; substantially as described.

6. In an oil-press, the combination with the press-chamber vertically arranged, with its receiving end downward and a hydraulic press
70 having a movable platen working in alinement with the press-chamber and adapted to move into and out of the receiving end of the press-chamber, of the charging-box movably working between the press-chamber and removable platen and having an opening through the same for the passage of the platen; substantially as described.

7. In an oil-press, the combination with the
80 vertically-arranged press-case with its receiving end downward, the hydraulic press having a movable platen working in alinement with the press-chamber and adapted to move into and out of the receiving end of the press-chamber, of the charging-box working between the said press-case and platen, the supply-hopper and means for moving said charging-box into and out of alinement with the said hopper and press-case respectively; substantially as described.

8. In an oil-press, the combination with the press-case and hydraulic press arranged in alinement therewith, of a charging-box movable into and out of registry with the press-case, a hopper for supplying material to said press-box, a motor for moving said box, a valve controlling said motor, end stops for controlling said valve to arrest the box at each extreme of its travel and an intermediate stop for controlling said valve to arrest the box at an intermediate point for the reception of a partition or division-plate; substantially as described.

9. In an oil-press, the combination with the
105 press-chamber, the hydraulic press arranged in alinement therewith, and the transversely-movable charging-box movable into and out of registry with said press-case, of a pressure-motor for moving the box, a valve controlling said motor, end stops controlling said valve to arrest the movement of the box at each extreme, and a pivoted intermediate stop for arresting the movement of the box at an intermediate point when moving reversely; substantially as described.

10. In an oil-press, the combination with the press-case and hydraulic press arranged in alinement therewith, of the transversely-movable charging-box, the pressure-motor
120 controlling the movement of the same, a valve controlling said motor, stops movable with the box for controlling said valve and a movable pin with which said stops cooperate whereby the valve may be released from engagement with the stops for manual operation; substantially as described.

11. In an oil-press, the combination with the pressing mechanism, of a press-chamber having top and bottom frames, intermediate
130 bars having their ends recessed into said frames and with their edges toward the inte-

rior of the press-chamber, spacers for separating said bars and a liner having alternating foraminous and non-foraminous sections and with the foraminous sections opposite the spaces between the bars; substantially as described.

12. In an oil-press the combination with the top frame, vertical bars having their upper ends recessed into said frame and a liner, of the bottom frame having recesses for the reception of the lower ends of said bars, spacers between the lower ends of the bars and a channel formed in the upper surface of the bottom frame and extending around the lower end of said bars; substantially as described.

13. In an oil-press, the combination with the press-case having vertical oil-channels therein, of partitions or division-plates having transverse oil-channels corresponding in number to and registering at the ends with the oil-channels in the press-case; substantially as described.

14. In an oil-press, the combination with a press-case, rectangular in cross-section and having longitudinally-arranged oil-channels in its walls, of partitions or division-plates

having internal transverse passages opening out in all four of its edges and adapted to register with the oil-channels of the side walls of the press-case; substantially as described.

15. A division-plate or partition for oil-presses formed of plates having their proximate faces channeled to form oil-passages with perforations through said plates for the passage of oil into said channels and a fibrous covering for preventing the entry of oleaginous material into the perforations; substantially as described.

16. A partition or division-plate for oil-presses formed of plates secured together and having their proximate faces channeled or grooved to form oil-passages with perforations through said plates for the passage of oil, fibrous material mounted on said plates to prevent the entry of oleaginous material into said perforations and marginal strips for retaining said fibrous material in place; substantially as described.

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