May 19, 1925. 1,538,375

J. J. BERRIGAN

HYDRAULIC PRESS

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Fig. 1.

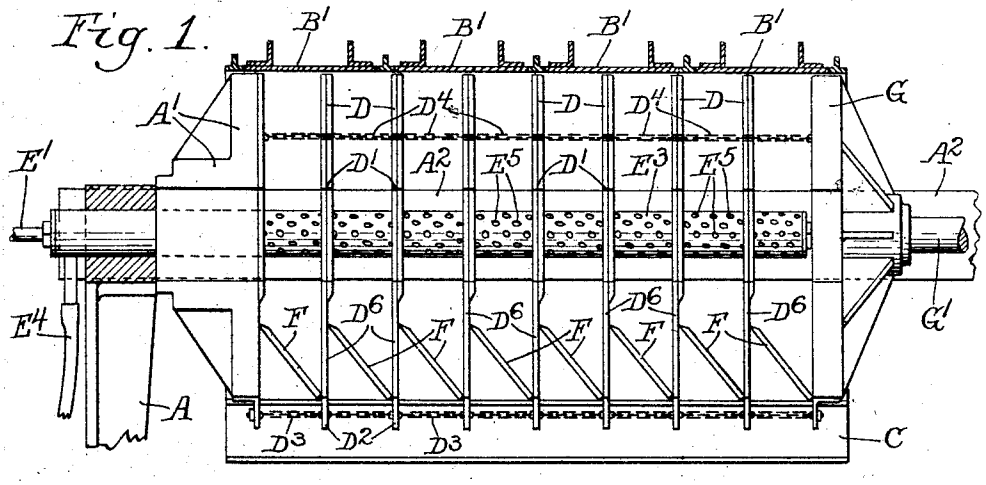


Fig. 2.

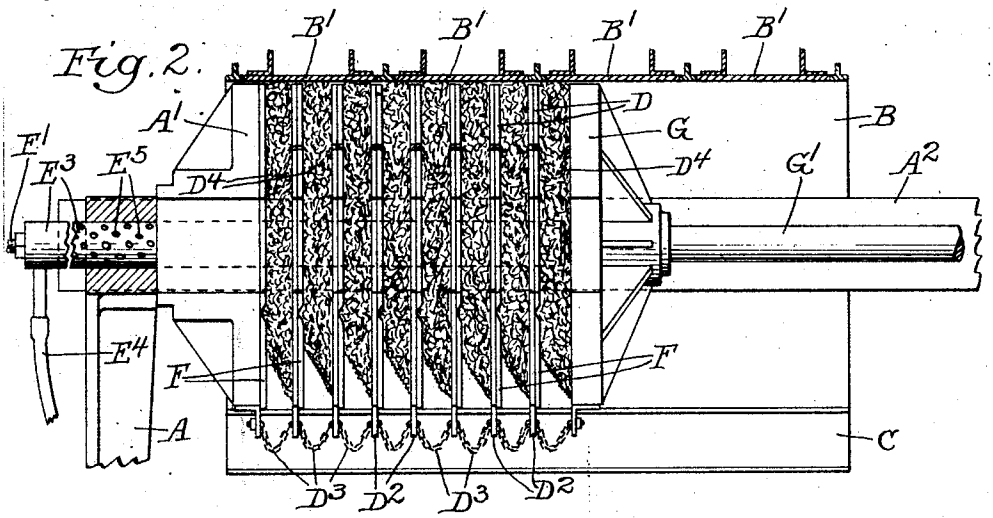
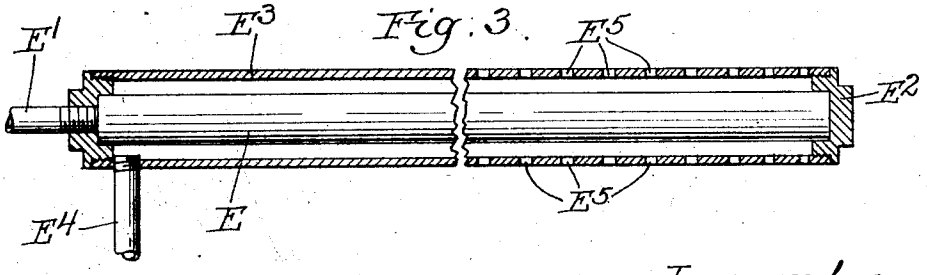


Fig. 3.



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Fig. 4.

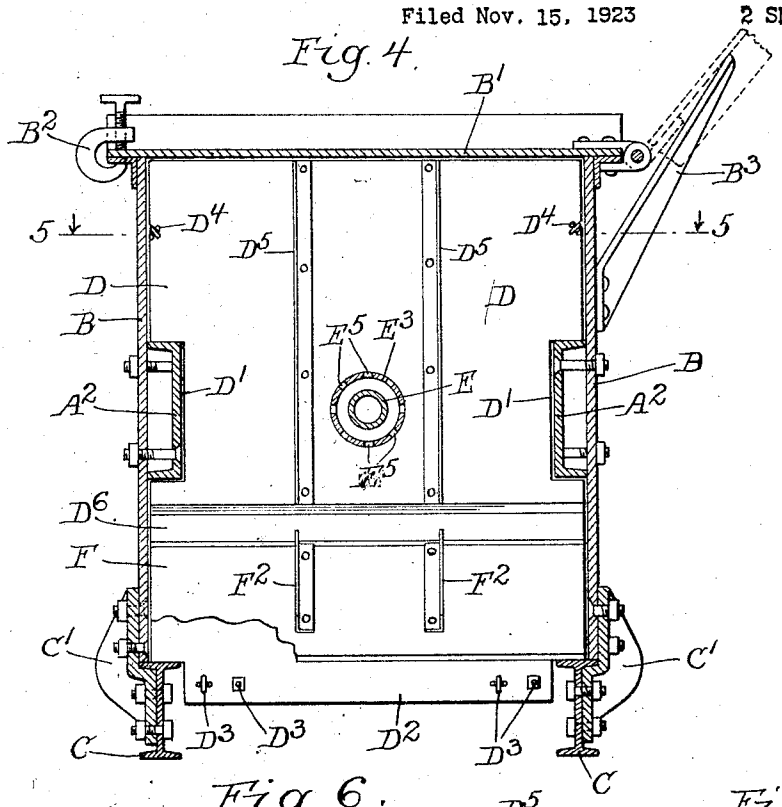


Fig. 6.

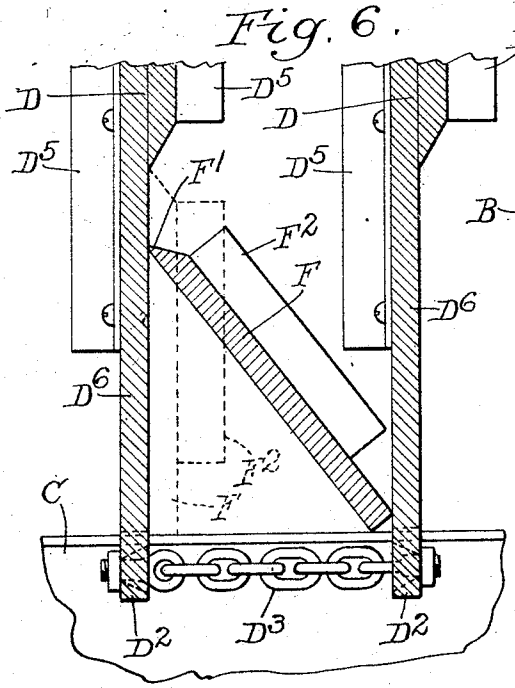
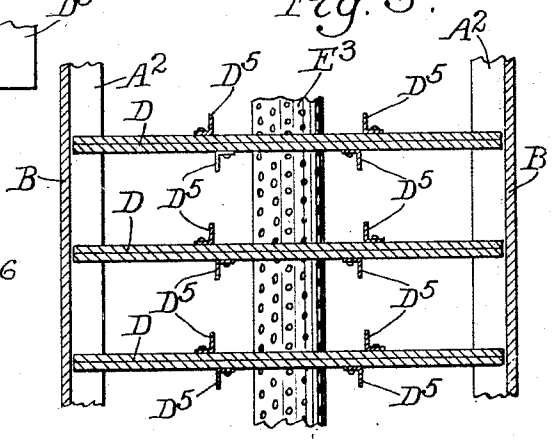


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN J. BERRIGAN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-THIRD TO JOHN B. BERRIGAN AND ONE-THIRD TO KATHERYNE P. MALON, BOTH OF CHICAGO, ILLINOIS.

HYDRAULIC PRESS.

Application filed November 15, 1923. Serial No. 674,823.

To all whom it may concern:

Be it known that I, JOHN J. BERRIGAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Hydraulic Presses, of which the following is a specification.

This invention relates to a hydraulic press. It has for one object to provide in such a press means for heating the same during the pressing operation. Another object is to provide means whereby the cake formed in the press is in such form and size as to be readily removed therefrom. Another object is to provide means whereby the liquor and matter being pressed will be readily discharged and whereby the compression pressure will be equalized and undue strain prevented. Other objects will appear from time to time throughout the specification and claims.

My invention is illustrated more or less diagrammatically in the accompanying drawings, wherein—

Figure 1 is a vertical cross section of one form of my press showing the press open for filling;

Figure 2 is a similar view showing the press partially closed after compression.

Figure 3 is a longitudinal cross section on an enlarged scale showing the heating pipe;

Figure 4 is a transverse vertical cross section through the press;

Figure 5 is a horizontal cross section taken at line 5—5 of Figure 4 showing particularly the cake cutting blades;

Figure 6 is a fragmentary vertical cross section on an enlarged scale showing the floor plate construction.

Like parts are designated by like characters throughout.

A is a frame member upon which is mounted a stationary platen A^1. Secured to this frame member A or to the platen A^1 is a pair of side members preferably in the form of channel sections A^2 A^2. These members are attached at one end to the member A and at the other end to a similar frame member not here shown. Surrounding the press is a housing made up of side walls B B and hinged top covers B^1. These covers are normally held closed by means of clamps B^2 and when opened are supported in the inclined position by supports B^3.

Beneath the press are two or more members preferably in the form of I beams C, C. These beams may be rigidly supported beneath the press in any suitable manner, but in the form shown are carried from the side walls B by means of cleats C^1 C^1.

Within the press is mounted a series of partitions D. These partitions are provided in their sides with notches D^1 D^1 by means of which they may rest upon the channel sections A^2. Each of the partitions D is provided on each of its faces with one or more cutting knives D^5. These knives in the form shown are angle irons secured to the faces of the partitions D and are all the same depth. They are staggered so that when the press is fully compressed and the partitions are forced together the blades overlap each other and thus cut the cake and render its removal from the press easier. The partitions D are provided with downwardly extending portions D^2 which extend downwardly between the I beams C, and to these portions are attached chains D^3 by means of which, when the press is opened the partitions are evenly spaced. Further chains D^4 are provided adjacent the top and act in a manner similar to the chains D^3 to space the tops of the partitions. For the sake of clearness the blades are not shown in Figures 2 and 3 as the scale there is too small and in order to avoid confusion they are omitted in those figures. They are, however, shown in Figures 4 and 5.

Located centrally in the press and passing through a suitable perforation in the frame A and the platen A^1 and slidably mounted therein and passing through the perforations in the partitions D is a double steam pipe. This pipe is formed of a centrally closed portion E to which steam is lead by any suitable conduit E^1. This pipe is closed at its outer end, preferably by means of a member E^2. Surrounding the pipe C is a perforated jacket E^3 to which steam is conducted by any suitable conduit such as E^4. The jacket E^3 is provided with perforations E^5 through which steam may escape to the interior of the press when supplied to the jacket.

Between each pair of partitions I insert loosely a floor plate F. This plate when the press is fully opened lies in a sloping position as indicated in Figure 1, and as the press is closed it will move under the pres-

sure of material which lies against it gradually to a steeper slope and will finally move over to the vertical position indicated in Figure 2 where it lies flat against the partition. Each of the partitions is provided toward its lower edge with a thinner downward portion D^6 of such thickness that when the plate assumes the vertical position shown in Figure 2 the combined thickness of the plate F and the portion D^6 will be equal to the thickness of the upper part of the partition. This is advantageous as it insure pressing all parts of the cake to an equal degree. The plate F is provided with an upper annular edge F^1 and has formed on its upper face one or more knife blades F^2 corresponding in thickness and depth to the knife blades D^5 above described.

Mounted in the press for reciprocation therein is a removable platen G. This platen is connected to a shaft G^1 which shaft is pressed forward and drawn back by a hydraulic cylinder or other suitable pressure exerting means.

Although I have shown an operative device, still it will be obvious that many changes in size, shape and arrangement of parts may be made without departing materially from the spirit of my invention; and I wish therefore that my showing be taken as in a sense diagrammatic.

The use and operation of my invention are as follows:

When the press is to be used, it is mounted in the position generally shown in Figure 1. Material to be pressed is then run into the press so that the spaces between all the partitions are filled. The movable platen is then moved forward so as to press the material. Where the class of material being pressed makes it advisable, steam is introduced to the steam pipe, and for some purposes it may be introduced only to the inner closed pipe thus heating the press. For other purposes it may also be introtroduced to the outer perforated jacket, and steam is thus introduced into the material being pressed and passes off through it and the entire body of material within the press is heated by the discharge of the steam. The pressing process continues during the heating and gradually the floor plates assume a steeper angle and presently they are forced by reason of pressure on one face and by reason of lack of pressure on the other face into vertical position, and in operation they slip or jump into this vertical position, which is illustrated in Figure 2. This movement permits the cake to expand downwardly and tends to relieve the danger of rupture or distortion of the parts due to excessive pressure. It also, of course, permits free discharge of liquor from the press through the bottom.

As the movable platen moves toward the fixed platen it contacts the closed end of the steam pipe assembly, and since the assembly is slidably mounted in the fixed platen, it is gradually pressed outward through it with the movement of the moving platen.

When the pressing operation is complete the partitions are forced together to such an extent that the knife blades on each partition overlap to some extent with those on the next partition and thus the cake is cut into several strips or pieces. At this point in the operation the movable platen is withdrawn and with it the partitions are spread apart again, since they are fastened to it. The steam pipe, however, remains in its previous position and is not withdrawn. Thus the cake is carried longitudinally away from the steam pipe and practically all of its is freed from it. Thus when the press is opened the cake can readily fall downward through the bottom without interference from the steam pipe which has been left behind.

When it is desired to use the press again, the steam pipe is pushed back into the press, the floor plates are replaced in the position shown in Figure 1 and the press is again filled.

I claim:

1. In a press members adapted to be moved together, and a floor plate adapted to retain the contents of the press placed between said members in an inclined position and adapted as the members are moved together to have its angle of inclination increased until it reaches the vertical.

2. In a press members adapted to be moved together, and a floor plate adapted to retain the contents of the press placed between said members in an inclined position and adapted as the members are moved together to have its angle of inclination increased until it reaches the vertical, and lies flush against one of said members.

3. In a press, members adapted to be moved together, blades projecting outwardly from the face of each of said members, and a floor plate loosely placed between said members in an inclined position and adapted as the members are moved together to have its angle of inclination increased until it reaches the vertical.

4. In a press members adapted to be moved together, blades projecting outwardly from the face of each of said members, adapted when the members are in their closest position to overlap each other, and a floor plate loosely placed between said members in an inclined position and adapted as the members are moved together to have its angle of inclination increased until it reaches the vertical, and means for heating the interior of said press.

5. In a press, members adapted to be moved together, blades projecting outwardly

from the face of each of said members, and a floor plate loosely placed between said members in an inclined position and adapted as the members are moved together to have its angle of inclination increased until it reaches the vertical, and means for heating the interior of said press, said heating means including means for discharging heated fluid into the interior of said press, and means for circulating a heating medium through a closed circuit within said press.

6. In a press, platens adapted to be moved together and a partition between them each provided with a blade extending outwardly from its face, in combination with a loose plate forming the floor of said press, lying normally in an inclined position and adapted as the press is closed to assume a steeper angle of inclination and adapted finally to move to a vertical position.

7. In a press, platens adapted to be moved together and a partition between them each provided with a blade extending outwardly from its face, means for heating the interior of said press comprising a closed heating circuit in combination with an open means for discharging a heated fluid into the interior of said press, in combination with a loose plate forming the floor of said press, lying normally in an inclined position and adapted as the press is closed to assume a steeper angle of inclination and adapted finally to move to a vertical position.

8. In a press, means for heating the interior thereof comprising a closed circuit through which heated fluid is circulated and an open circuit from which heated fluid is free to discharge into the interior of the press.

9. In a press, means for heating the interior thereof comprising a closed circuit through which heated fluid is circulated and an open circuit from which heated fluid is free to discharge into the interior of the press, said heating means being slidably mounted within said press and adapted in the operation of the press to be partially pushed out therefrom.

10. Means for heating a hydraulic press comprising a pipe assembly slidably mounted therein, said assembly provided with an interior closed heating pipe, means for introducing heat thereto, there being about said closed pipe a perforated surrounding pipe, means for supplying steam to said surrounding pipe, the said pipe being adapted to permit the escape of said steam through its perforations to the interior of said press.

11. In a hydraulic press, a plurality of partitions, each of said partitions provided with cutting blades.

12. In a press a plurality of partitions, each of said partitions varying in thickness from its top to its bottom, and each being provided in each of its sides with a plurality of knife blades, said blades being offset so that those of one partition may overlap those of its adjoining partition when the same are pushed together, said blades being adapted to cut the cake between a pair of partitions into a plurality of portions.

13. In a hydraulic press having an open bottom, one or more loose floor plates, said plates being loosely set into said press and occupying when the press is open an inclined position, adapted as the press closes to increase the angle of said inclination until as the press approaches its inner limit they rise to a vertical position and move over under the influence of the material within the press to lie against one of the partitions, said floor plates provided each with a bevelled upper edge and with one or more cake cutting blades.

14. In a hydraulic press a pair of platens adapted to move towards each other, a plurality of partitions located between said platens, each provided on each of its sides with a plurality of blades extending outwardly toward the adjacent partition, means for heating said press comprising a heating pipe assembly slidable therein and adapted to be pushed out longitudinally by means of the movement of one of said platens, said assembly including a closed heating pipe, means for introducing steam to the same, and a surrounding open heated pipe adapted to discharge steam into the interior of said press, and means for supplying steam to said open pipe, a plurality of loose floor plates mounted one between each pair of partitions, said floor plates adapted when the press is open to lie in an inclined position and adapted as the press is closed to assume a steeper angle of inclination and adapted finally as the press approaches its extreme closed position to move into a vertical position and to lie against one of the partitions between which it is positioned, said floor plates provided with knife blades adapted to serve as continuations of the blades of the compartments within which they lie.

15. In a press, members adapted to be moved together and a floor plate adapted to support the contents of said press placed between said members in an inclined position and adapted as the members are moved together to have its angle of inclination increased.

16. In a press, a pair of members adapted to be moved together and a partition between said members and floor plates on each side of said partition adapted to support the contents of the press and placed in an inclined position and adapted, as the members are moved together, to have their angle of inclination increased until they reach the vertical.

17. In a press, members adapted to be moved together and a partition between

them, floor plates on either side of said partition adapted to support the contents of the press placed in an inclined position and adapted as the members are moved together to have its angle of inclination increased and flexible members beneath said floor plates attached to said press members and to said partitions.

18. In a press means for closing the bottom of said press, including a plate adapted to retain the contents of the press extending laterally across the bottom of said press lying in a generally inclined plane.

19. In a press means for closing the bottom of said press, including a plate adapted to retain the contents of the press extending laterally across the bottom of said press lying in a generally inclined plane, said plate adapted when closed to form a steeper angle of inclination and finally assume a vertical position, and in such vertical position to lie against a transverse wall of said press.

Signed at Chicago, county of Cook and State of Illinois, this 13th day of November, 1923.

JOHN J. BERRIGAN.