

Oct. 13, 1931.

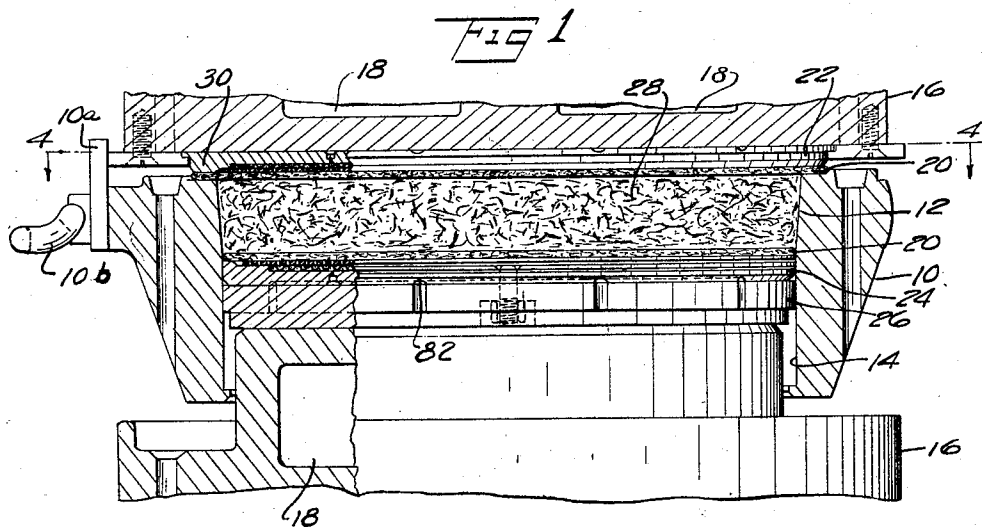
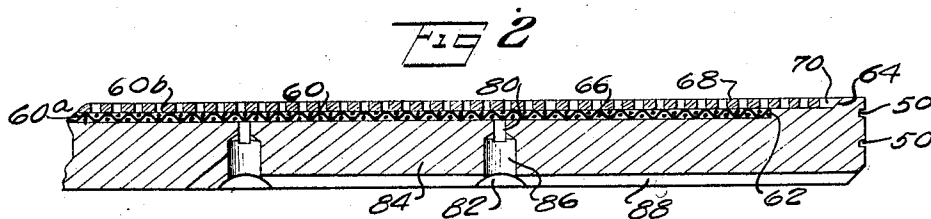
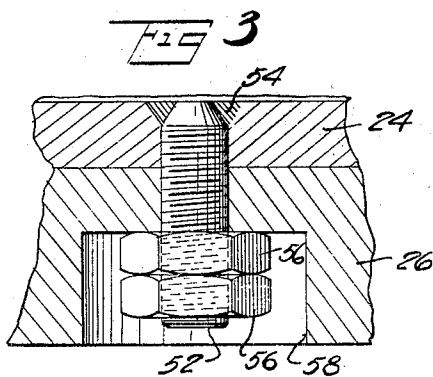
F. S. CARVER

1,826,729

PRESS

Filed Dec. 26, 1923

2 Sheets-Sheet 1



INVENTOR
Fred S. Carver.
BY *H. H. Dyke*
ATTORNEY

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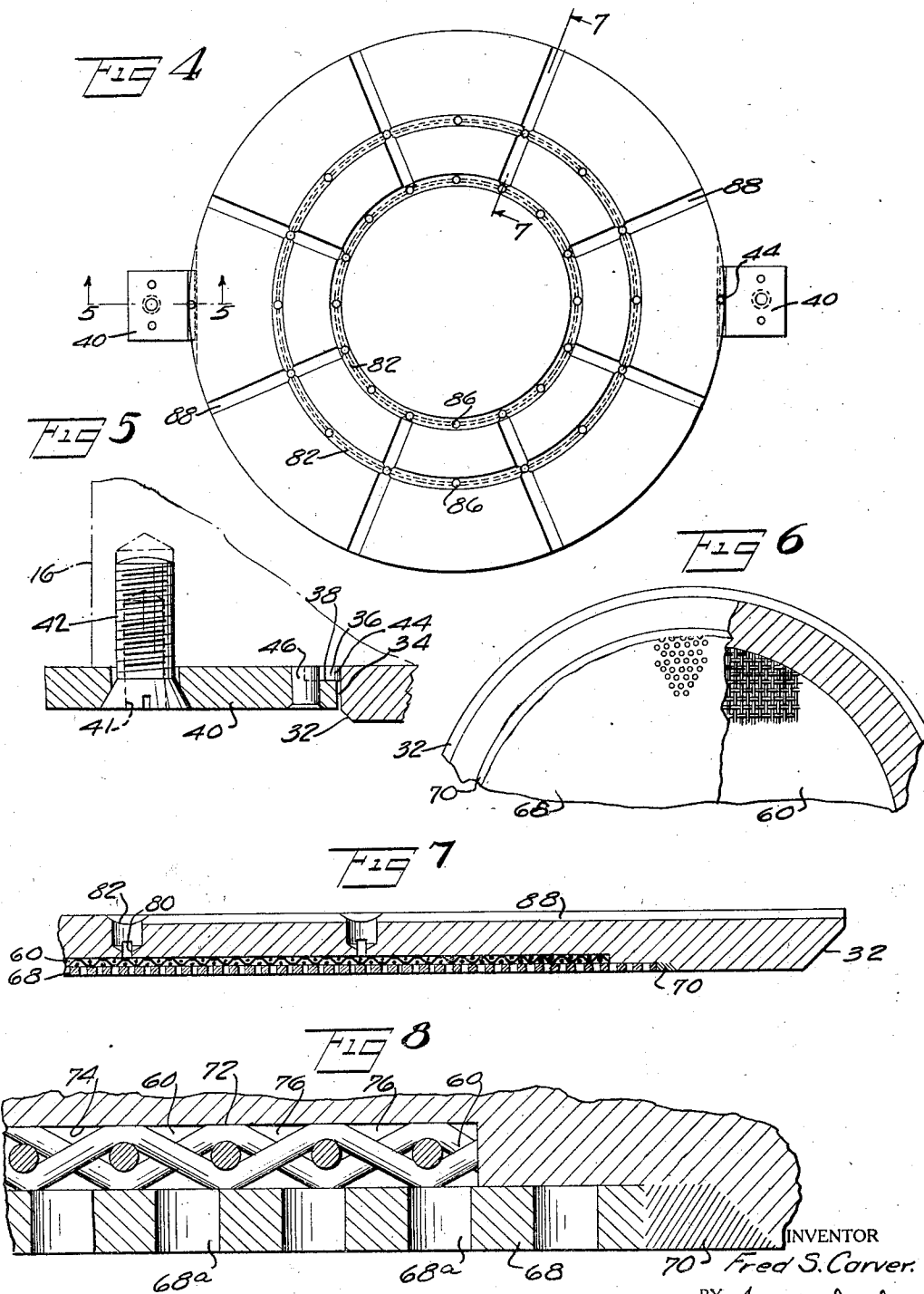
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UNITED STATES PATENT OFFICE

FRED S. CARVER, OF EAST ORANGE, NEW JERSEY

PRESS

Application filed December 26, 1923. Serial No. 682,822.

My invention relates to presses, and particularly to the provision of an improved construction of pressure plate and fluid passages thereof.

5 The invention, while applicable to presses of various kinds, is illustrated herein in connection with a pot press, but without limitation thereto.

10 It has been customary in pot presses to provide the pressure plates with laterally opening passages having small holes drilled through from the pressing face to communicate with such passages. This necessitates the drilling of many small holes at predetermined or "spotted" locations, is expensive and troublesome to produce and is dependent in operation to a large extent upon lateral flow of expressed fluid taking place within the material of the press cake and filter pad, as the drilled holes are in practice at least half an inch apart due to the prohibitive cost of drilling holes more closely spaced than this.

25 These and related difficulties are eliminated and increased extraction obtained in accordance with the present invention. The pressing face of my improved pressure plate is made up of foraminated sheet metal, preferably sheet steel. The closely spaced holes, which may be spaced as close as $\frac{1}{8}$ " , for example, can be cheaply made by punching the thin steel plate, are many times more numerous than can be drilled in to meet internal passages, and provide for the free flow of fluid from all parts of the pressing surface and practically do away with all lateral flow of fluid through parts of the filter pad and press cake.

40 The lateral flow of expressed fluid after passing back through the face plate is secured by providing a supporting backing for the punched steel face plate made of reticulated material, as relatively coarse wire mesh. In order to secure extensive support for the face plate and to prevent crushing under the enormous hydraulic pressure used, which may be as high as 5000-6000 lbs. per square inch, this wire mesh material is rolled or otherwise flattened out under extremely high pressure. I prefer to pass it between pressure

rolls, which are screwed up between passes until it is flattened at the wire crossings to such extent that there will be no further substantial yield when used in a hydraulic press as a backing for the foraminous surface plate of sheet metal. In this way a very extensive support for the face plate is secured, and at the same time ample provision is made for flow of expressed fluid laterally through the interstices and passages in the mesh.

60 The discharge passages back of the reticulated mesh material may be made in any desired way, so long as a firm substantial structure is obtained which will not give way under the very high pressure. I prefer to form same as narrow grooves in the back of the pressure plate, and partly radial and partly concentric outlet grooves are preferably used, the former to carry the liquid to the discharge outlets and the latter to establish communication with the radial outlet grooves. With such arrangement the holes leading to the narrow grooves formed in the pressure plate behind the reticulated disk may be made quite large and only a comparatively small number thereof are required to drain the expressed liquid from the space behind the reticulated disk to the outlet grooves.

75 With pressure plates such as described, the customary filter pads, such as filter pads of camel's hair, are made use of, and the passage of expressed fluid is substantially directly through the pad, the close spacing of the holes in the sheet metal eliminating any necessity for travel of expressed fluid laterally through the filter pad and press cake.

80 In the accompanying drawings I have illustrated the invention as embodied in a pot press. In said drawings, Fig. 1 is a section through a pot having top and bottom pressure plates made in accordance with my invention. Fig. 2 is a section of the pressure plate of my invention forming part of the slidable pot bottom. Fig. 3 is a detail section showing a preferred mode of securing the pressure plate to the pot bottom. Fig. 4 is a section on line 4-4, Fig. 1, and showing the back of the top pressure plate. Fig. 5 is a section on line 5-5, Fig. 4. Fig. 6

is a fragmentary face view of a pressure plate with parts broken away to show the interior construction. Fig. 7 is a transverse section of the top pressure plate taken on line 7-7, Fig. 4, and Fig. 8 is an enlarged detail section showing how the reticulated backing has been rolled or otherwise flattened prior to insertion in the pressure plate.

The press pot 10 may be of any usual construction, but is preferably made with the upper part 12 of the otherwise cylindrical bore 14 enlarged on a taper in accordance with my U. S. Patent No. 1,247,078 of Nov. 20, 1917.

The press platens 16, 16 are likewise of any usual construction and may include interior heating chambers 18, 18. The customary camel's hair filter pads 20, 20 are likewise used, in which respect this application is distinguished from my Patent No. 1,771,526, dated July 29th, 1930, application for which was filed on even date herewith.

The invention of the present application resides in the construction of the top and bottom pressure plates 22 and 24, the former of which 22 is secured to the under side of the platen 16, and the latter 24 is secured to the slidable pot bottom or platen 26, and which under actuation by a ram serve to impart pressure to the pot contents 28, such as ground cocoa beans, copra meal, etc.

Pressure plates 22 and 24 are of like construction so far as channels for outlet of expressed fluid are concerned, and differ only in details of construction due to the fact that the top plates 22 are secured to the bottom of press platens 16, and the bottom plates 24 are secured to the press bottoms 26.

The top press plate 22 extends outwardly over pot 10 as shown at 30 to make a seal with the upper camels hair pad 20 interposed therebetween. Its under margin is preferably tapered as shown at 32.

Means are provided for securing the pressure plate 22 to the under side of press platen 16. In the form shown the tapered margin 32 is milled away each side as shown at 34, leaving a fin 36 adapted to be received in a notch 38 formed in the holding block 40, which is secured to the under side of platen 16, as by screw 41 and pins 42. Fins 36 have central notches 44 adapted to receive the rivets 46 in blocks 40, and thereby position the pressure head 22 with respect to blocks 40 and the under side of platen 16. So supported the plate is accurately positioned and firmly held without making any screw holes in it, or otherwise deforming or defacing the smooth face to be contacted by the filter pad, or bringing the filter pad into contact with fastening devices which might become loosened, but the plate can nevertheless be taken out when desired by removing the screws in supporting blocks 40. One of the blocks 40 may conveniently serve as a

stop for pot 10 as same is slid in from its rack, the pot being stopped and positioned in proper place by the lug 10a on pot handle 10b coming to rest against one of the blocks 40, as shown in Fig. 1.

The bottom pressure plate 24 fits the cylindrical bore 14 of pot 10 and has one or more grooves 50 in its edges, which serve as packing grooves when filled with the solid part of material being pressed. This bottom plate 24 is preferably secured to the pot bottom 26 by a central bolt 52 screwed and welded in plate 24, the material of the weld being indicated at 54 (Fig. 3) and lock nuts 56, 56 being applied to the end of bolt 52 within a recess 58 in the lower side of pot bottom 26. The welded end of bolt 52 is milled or ground flat as shown.

The inner sides or faces of the pressure plates are formed with a recess 60, which is preferably stepped at its margin, as shown at 62, 64. The deeper relatively narrower recess part 60a is for receiving the reticulated disk 66 and the shallower relatively wide recess part 60b for receiving the foraminated surface disk or plate 68.

The reticulated or mesh wire disk 66 is originally of a thickness at the wire crossings considerably in excess of the height allowed therefor in recess part 60a, but before being put into place same is thinned down or flattened as by rolling between pressure rolls until its gage is approximately the same as the depth of the recess part 60a into which it is inserted after being suitably trimmed to shape.

After the reticulated disk 66 is in place the foraminated plate or disk 68 is inserted in its recess part 60b and is secured in place therein, preferably by welding, the welding material 70 being finally machined or ground off to provide a plane smooth surface or face for the pressure plates in order to avoid injury to the expensive camel's hair pads.

It will be seen that the numerous and extensive flats 72 at wire crossings of the reticulated disk 66 afford a support between foraminated plate 68 and the bottom wall 74 of recess 60, which keep these parts strongly and firmly spaced apart and at the same time there is ample room, as at 76, Fig. 8, for passage laterally to suitable outlets of all fluid entering through the numerous holes 68a in the face plate 68.

The drain passages in plates 22 and 24 may be of various forms. In the construction shown relatively narrow circular grooves 80 are formed in the bottom wall 74 of recess 60 and registering wider and shallower concentric grooves 82 are formed in the back wall 84 of the pressure plates, and grooves 80 and 82 are connected by a relatively few and comparatively large drilled holes 86, and the expressed fluid is led to the margin of the pressure plates and discharged by radial

grooves 88 formed in the back wall 84 of the pressure plates and communicating with the concentric grooves 82.

It will be seen that the invention involves numerous features of advantage. The punched plate and mesh backing disk are relatively inexpensive, the construction involves simple machining and welding operations, the outflow of expressed fluid is practically uniform throughout the surface of the pressure plate and greatly increased efficiency is obtained, together with a substantial saving in manufacturing cost.

It is to be understood that the apparatus shown is intended merely for the purpose of illustrating and affording an understanding of the invention, and is not intended for limiting the scope of the invention, which is as defined in my claims.

I claim:

1. A press plate for presses to be used in conjunction with filter pads, having a stepped recess in the side adjacent to the filter pad, a face plate of foraminous sheet metal welded in place in the outer part of the recess and flush with the margin of the pressure plate, a reticulated backing disk in the inner part of the recess of wire mesh normally of greater thickness than the depth of inner part of the recess, but flattened out so that its thickness is substantially the same as the depth of the inner part of the recess, fluid outlet grooves provided in the pressure plate and opening into the recess, outlet grooves provided in the back of the pressure plate, and passages provided in the pressure plate to connect said first and second named grooves.

2. A top pressure plate for pot presses, having fluid outlet passages therein and comprising thinned and notched edge parts, and means for suspending said plate comprising notched members, the notches whereof are adapted to be entered by the thinned parts of the plate, and studs intersecting said notches in the notched members and adapted to be received in the notches in the edges of the plate.

3. A pot bottom for pot presses, comprising a base part and a pressure plate having outlets for fluid passages, said pressure plate having a recess therein and having a disk of foraminated sheet metal and a backing of wire mesh in said recess, and a bolt connecting said plate with said base part, the bolt being welded in the pressure plate flush with the inner wall of the recess therein.

4. In a filter press, a press member for applying pressure through a removable filtering medium comprising a main pressure plate with flow openings therein and open at a face thereof, a coarse reticulated member engaging said face and bridging the openings in the main plate, and a finely foraminated strong metal plate over the reticulated mem-

ber and bridging the openings thereof, the relation of the successive passages so provided being such that the expressed liquor has progressively greater freedom of flow in passing through the passages in the foraminated plate, reticulated members and main plate successively.

5. A pressure plate for high pressure presses, comprising a face plate of closely perforated steel, a wire mesh backing behind the face plate, a metal plate backing behind the wire mesh and provided with narrow channels for fluid passage in communication with the passages in the wire mesh, said channels being bridged by said wire mesh backing, and said metal plate having fluid outlet passages in the rear thereof, and transversely extending holes bringing said rear outlet passages into communication with said narrow channels.

In testimony whereof, I have signed my name hereto.

FRED S. CARVER.