

(No Model.)

2 Sheets—Sheet 1.

H. P. CHAMBERLAIN.
FILTER PRESS PLATE.

No. 586,593.

Patented July 20, 1897.

FIG. 1.

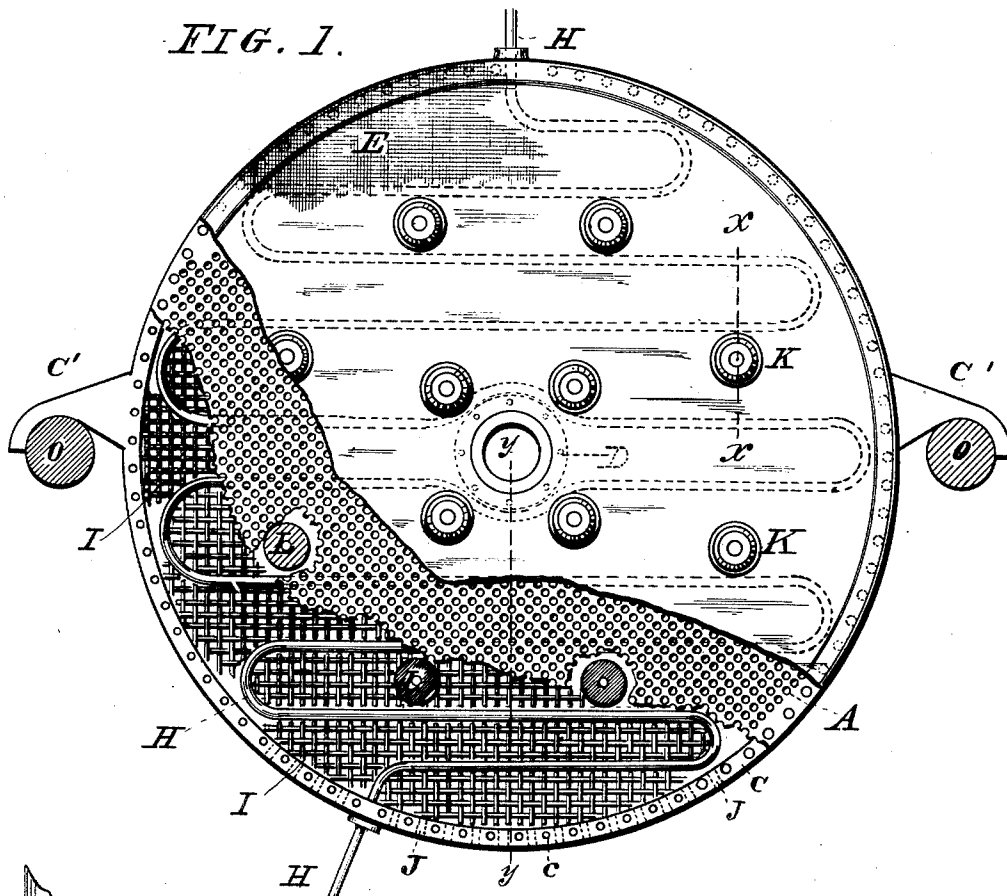
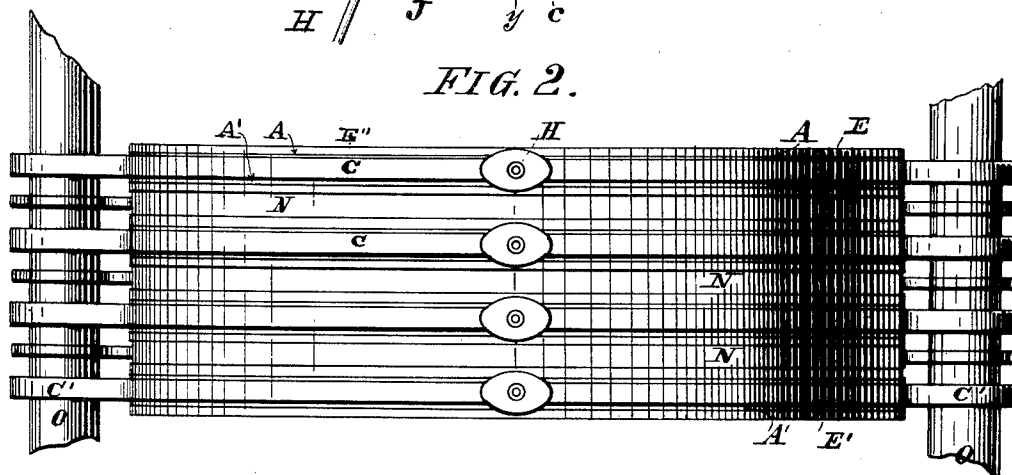


FIG. 2.



Witnesses:

Ch. Stark.
Julian Stark

Inventor :

Horace P. Chamberlain
by Michael J. Stark & Sons
Attorneys.

(No Model.)

H. P. CHAMBERLAIN.
FILTER PRESS PLATE.

2 Sheets—Sheet 2.

No. 586,593.

Patented July 20, 1897.

FIG. 3.

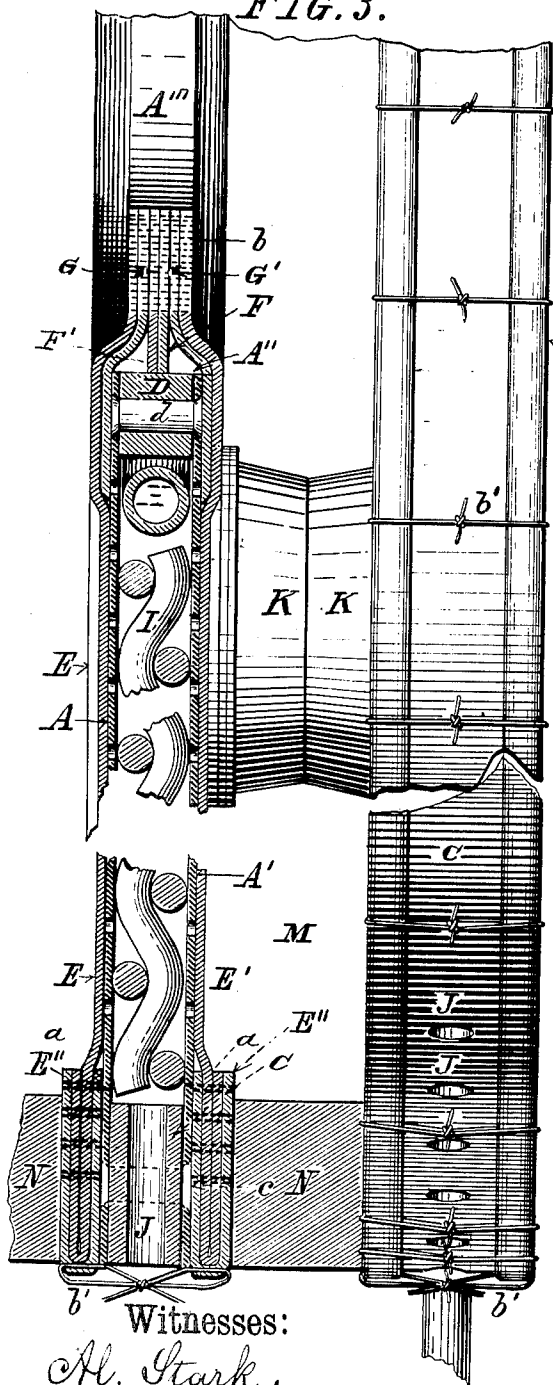


FIG. 4.

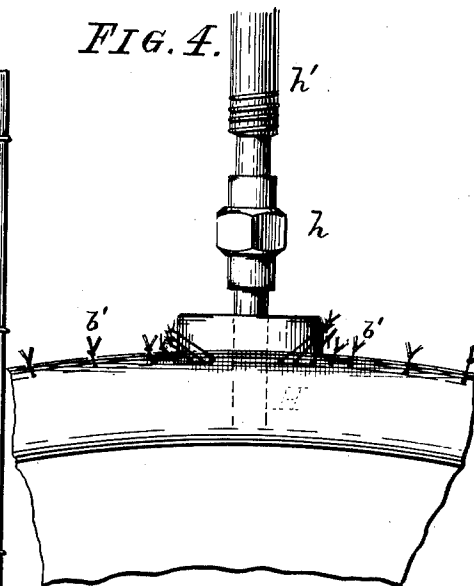
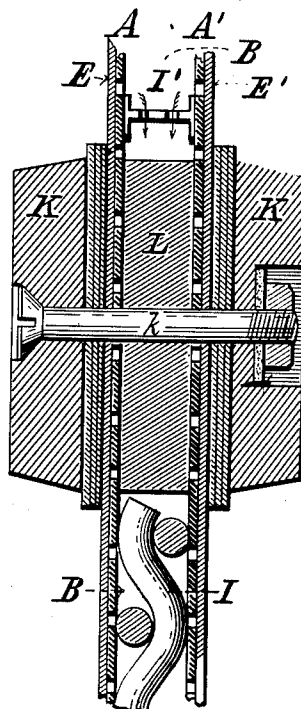


FIG. 5.



Witnesses:

M. Stark.
Julian Stark.

Inventor :

Horace P. Chamberlain
by Michael J. Stark & Sons,
Attorneys.

UNITED STATES PATENT OFFICE.

HORACE P. CHAMBERLAIN, OF BUFFALO, NEW YORK.

FILTER-PRESS PLATE.

SPECIFICATION forming part of Letters Patent No. 586,593, dated July 20, 1897.

Application filed March 8, 1897. Serial No. 626,468. (No model.)

To all whom it may concern:

Be it known that I, HORACE P. CHAMBERLAIN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Filter-Press Plates; and I do hereby declare that the following description of my said invention, taken in connection with the accompanying sheets of drawings, forms a full, clear, and exact specification, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has general reference to improvements in filter-press plates; and it consists, essentially, in the introduction therein of means for heating the space between the adjacent plates, as hereinafter first fully set forth and described, and then pointed out in the claims.

The object of this invention is the production of an efficient and serviceable filter-press plate, and in order to secure this object I construct this device as shown in the drawings already mentioned, in which—

Figure 1 is a side elevation of my improved filter-press plate. Fig. 2 is a plan of a series of these plates suspended from the usual side rods. Fig. 3 is a transverse sectional elevation in line *yy* of Fig. 1 of a portion of two adjacent plates, one of which is shown in end elevation. Fig. 4 is an elevation of the upper portion of a filter-press plate, and Fig. 5 is a transverse sectional elevation of a fragment of the same in line *xx* of Fig. 1.

Like letters of reference denote similar parts in all the figures.

A A' in the drawings designate the two perforated plates of a filter-press plate, which are placed a suitable distance apart, so as to produce between them a chamber B. These plates are riveted at their periphery to a ring C by flush-rivets *c* and near their center to an inner ring D by flush-rivets *d*, there being centrally in said plates an opening or hole A'' for the passage of the liquid to be filtered.

E E' are canvas covers on the outer surface of the perforated plates A A'. These covers are preferably made from four-ply canvas fabric and they are applied to the perforated plates in the following manner: Circular

disks of canvas of sufficient diameter are doubled up at their outer edges, as shown at *a* in Fig. 3. Rings of canvas E'' are also doubled up, so as to have a U-shaped transverse section, and these rings are slipped over the outer doubled-up edge of the canvas disks and the edges of the canvas rings E'' are then sewed to the disks E E', as clearly indicated in said Fig. 4, which completes the outer periphery of the said canvas covering. In the center of these canvas disks E E' there are circular openings smaller in diameter than the openings in the perforated plates A A'. Two rings F F' of canvas are provided, having central openings corresponding to the openings of the canvas disks E E' and an outside diameter coinciding with the openings in the perforated plates, and two further rings G G', having also central apertures corresponding to those of the other canvas rings and the canvas disks, but whose outside diameter is larger than the central openings in the perforated plates, are placed into position in the following order: The rings F F' are placed centrally into the central opening of the perforated disks, then the two rings G G' are placed on each side of the rings F F', after which the canvas disks E E' are pulled over the rings G G' and the whole canvas structure thoroughly sewed or stitched around their central openings at *b* to unite the several layers and thereby to adapt them to resist the considerable pressure exerted upon them by the liquid to be filtered.

In order to prevent misplacement or disarrangement of the canvas layers at the outer periphery of the filter-plates when removed from the filter-press, the periphery of these canvas disks are connected together at suitable intervals by stitches or cords *b*, as clearly illustrated in Figs. 3 and 4.

H is a coil of pipe placed between the perforated disks A A' in the chamber B in a series of return-bends, as shown in dotted lines in Fig. 1. One end of this pipe passes through the highest part of the filter-plate and is provided with a coupling *h*, by means of which and a hose *h'* it is connected with any suitable source of heat, while the opposite end of this pipe H passes from the filter-plate, near its lowest part, as shown in said Fig. 1.

I is a series of a wire or rod fabric placed into the chamber B to fill the same as much as possible. This wire or rod fabric serves as a filler for the space between the two adjacent perforated plates to prevent them from collapsing or being pressed toward each other when the filter-press is in operation. They are of a woven or interlaced structure to enable the liquid substances passing through the canvas and perforations of the plates to pass through the chamber B, from which exit is had through a series of apertures J in the lower portion of the outer ring C, to which the perforated plates A A' are riveted.

K are a series of separating-disks suitably disposed upon the plane surfaces of the filter-press plates. They are constructed substantially as shown and described in Letters Patent of the United States granted to me January 26, 1897, No. 575,875, except that in this present instance they are placed between the perforated plates A A' in the chamber B, further separating plates L to sustain the perforated plates A A' when the separating-disks K are fastened to the press-plates by the bolts k.

The operation of these filter-press plates is substantially as follows: Steam, hot air, or any other suitable heating medium is passed through the heating-coil H to heat the chamber B and by conduction of the filler fabric I the perforated plates A A'. The liquid to be filtered is passed through the central aperture A''' in the press-plates and passes into the space M, Fig. 3, between the adjacent filter-press plates, from which the liquid passes through the canvas covers and the perforated plates to the chamber B, and thence escapes through the discharge-openings J, the solid matter remaining in the space or chamber M.

In the production of stearic acid and other substances and the filtering of tar, &c., it is at present impossible to produce perfect results, owing to the fact that these semifluid substances will not pass through the filter under any pressure that can be applied thereto. This difficulty I have overcome by the application of heat to the filter-press plates, which liquefies these substances and thereby enable the separation of the liquid from the solid portions thereof.

Instead of a woven or interlaced filling I, I may substitute perforated or notched bars I', as shown in Fig. 5, to form a backing to the perforated plates and at the same time provide for means for the passage of the liquid or liquefied substances. While thus answering the purpose, I prefer the interlaced or reticulated rod structure, owing to the fact that it is easily produced, capable of being readily placed into position, and forms an ex-

cellent conductor of heat, thereby producing an even temperature in the entire structure.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent of the United States—

1. A filter-press plate consisting of two perforated plates separated a suitable distance, as described, a canvas covering on the outer sides of these plates, a heating-coil between these perforated plates, and a filling between the plates adapted to sustain the plates against pressure, and to permit the passage of the filtered substance, as and for the object specified.

2. In a filter-press plate, a heating-coil between two adjacent plates, a separating-ring between the said plates, and a filling of reticulated fabric, between the said plates and around the said heating-coil, as set forth.

3. A filter-press plate composed of two perforated plates, an outer ring to which the two plates are secured at their periphery, an inner ring to which the two perforated plates are affixed around their central openings, a canvas covering on the outer sides of said perforated plates, a heating-coil, and a filling between said perforated plates, as and for the object set forth.

4. In a filter-press plate, the combination, with two perforated plates separated by an outer and inner ring, of two canvas covers, one on each side of the said perforated disks, said canvas covers having their outer periphery doubled, a U-shaped ring of canvas passed over the doubled-up portion of said covers and stitched thereto, a series of canvas rings interposed between said canvas covers near their central openings and stitched together as described, said canvas covers being tied together at their periphery, as and for the purpose stated.

5. A filter-press plate consisting of two perforated plates, an outer and an inner ring to which said plates are affixed, a heating-coil and reticulated rod fabric between said perforated plates, canvas covers on the outer sides of said perforated plates, a series of separating-disks on the outer surface of the canvas covers, and a like series of filling-disks between the perforated plates, said separating-disks and filling-disks being secured in position by bolts passing through the separating and filling disks, as and for the object set forth.

In testimony that I claim the foregoing as my invention I have hereunto set my hand in the presence of two subscribing witnesses.

H. P. CHAMBERLAIN.

Attest:

C. O. STILLMAN,
HENRY BABEL.