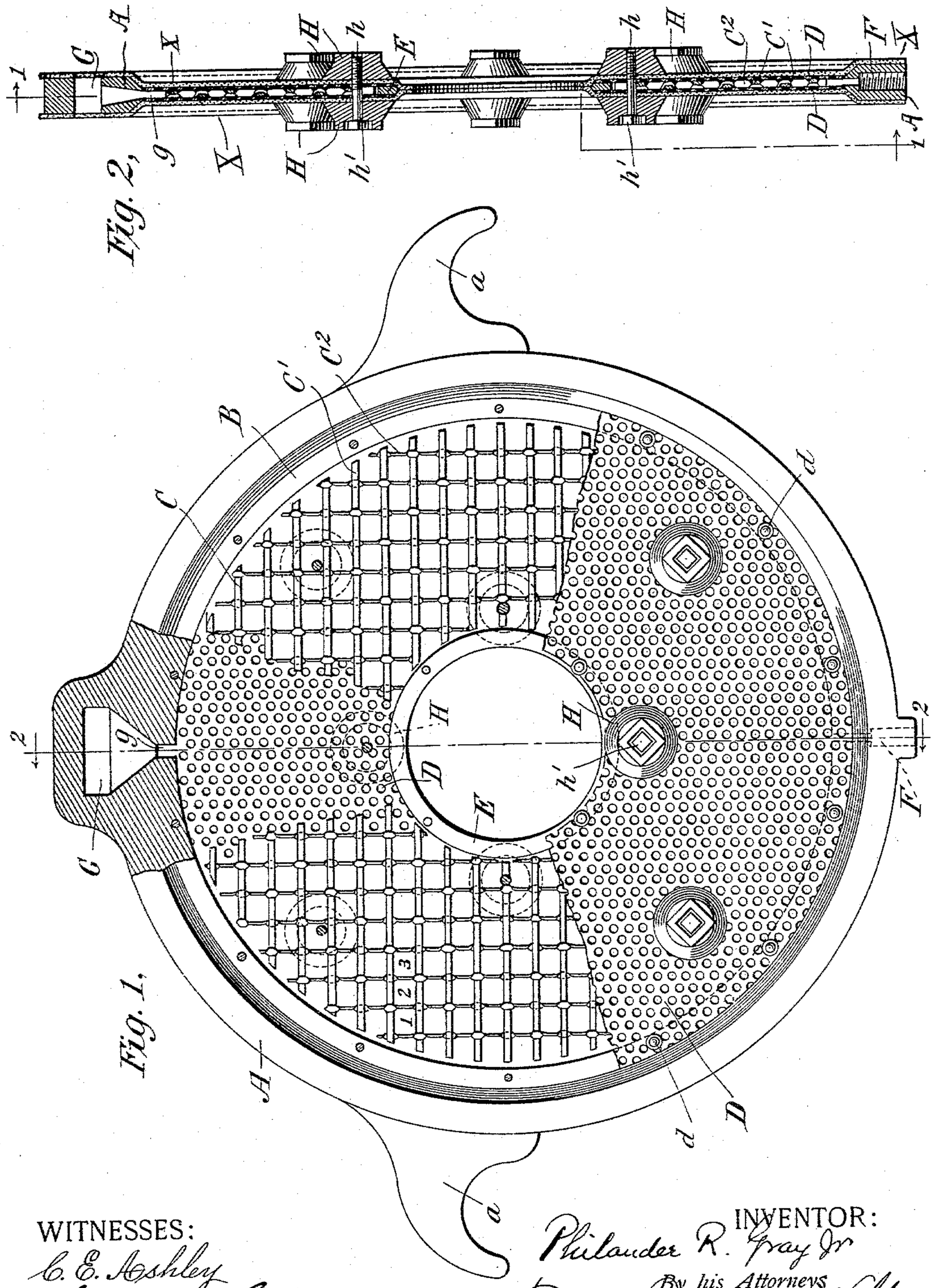
(No Model.) 2 Sheets—Sheet 1.

P. R. GRAY, Jr.

FILTER PRESS.

No. 596,995. Patented Jan. 11, 1898.



WITNESSES:
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INVENTOR:
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4,

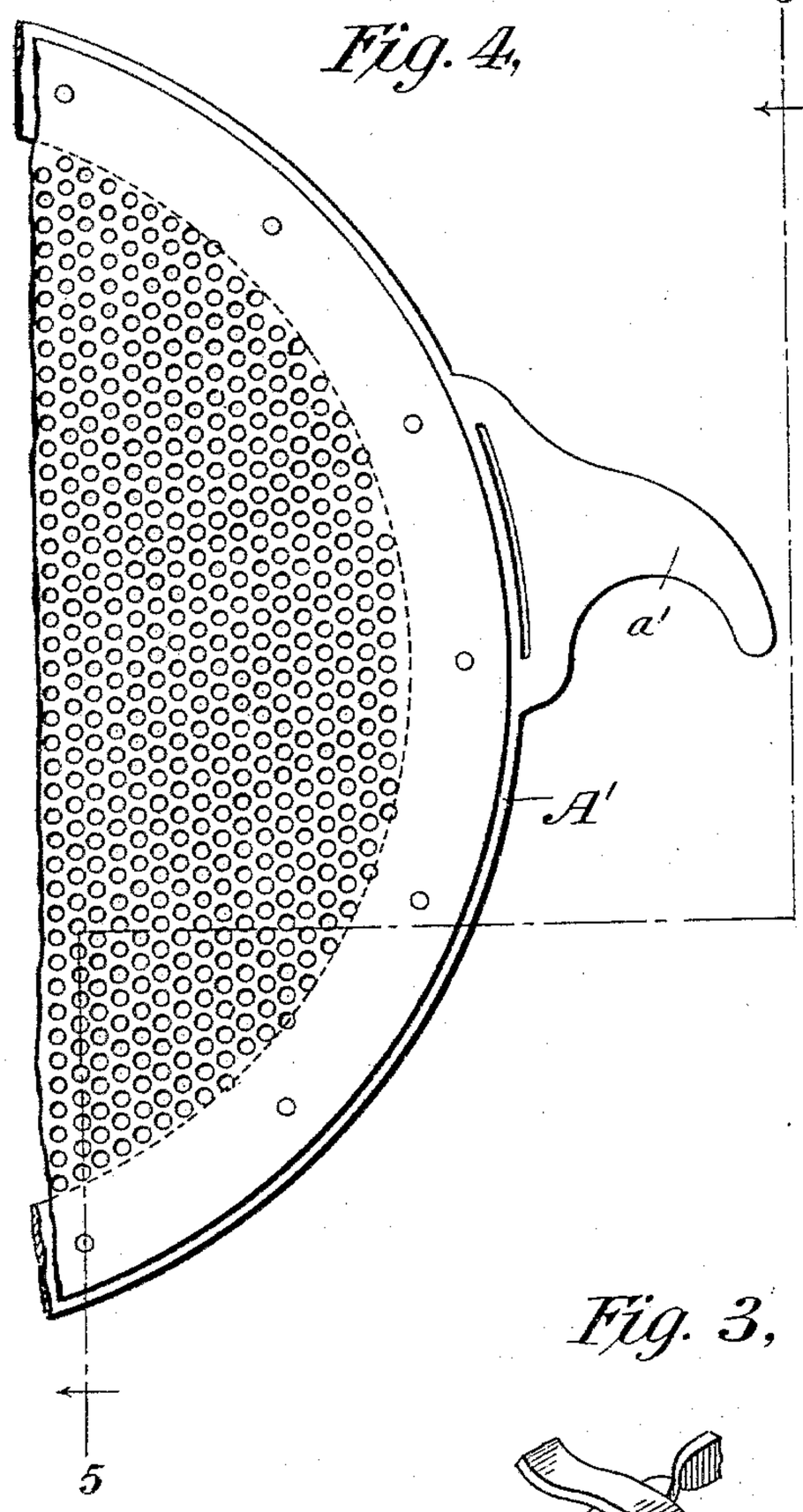


Fig. 5,

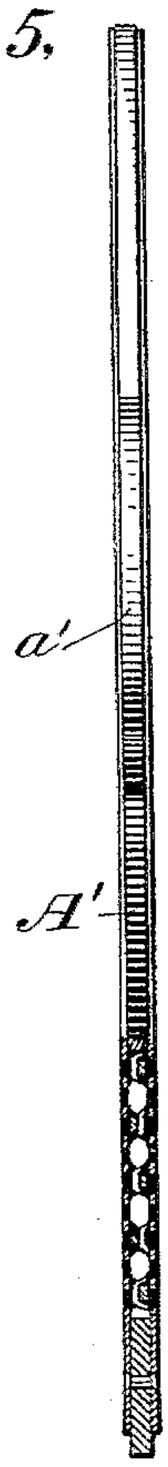
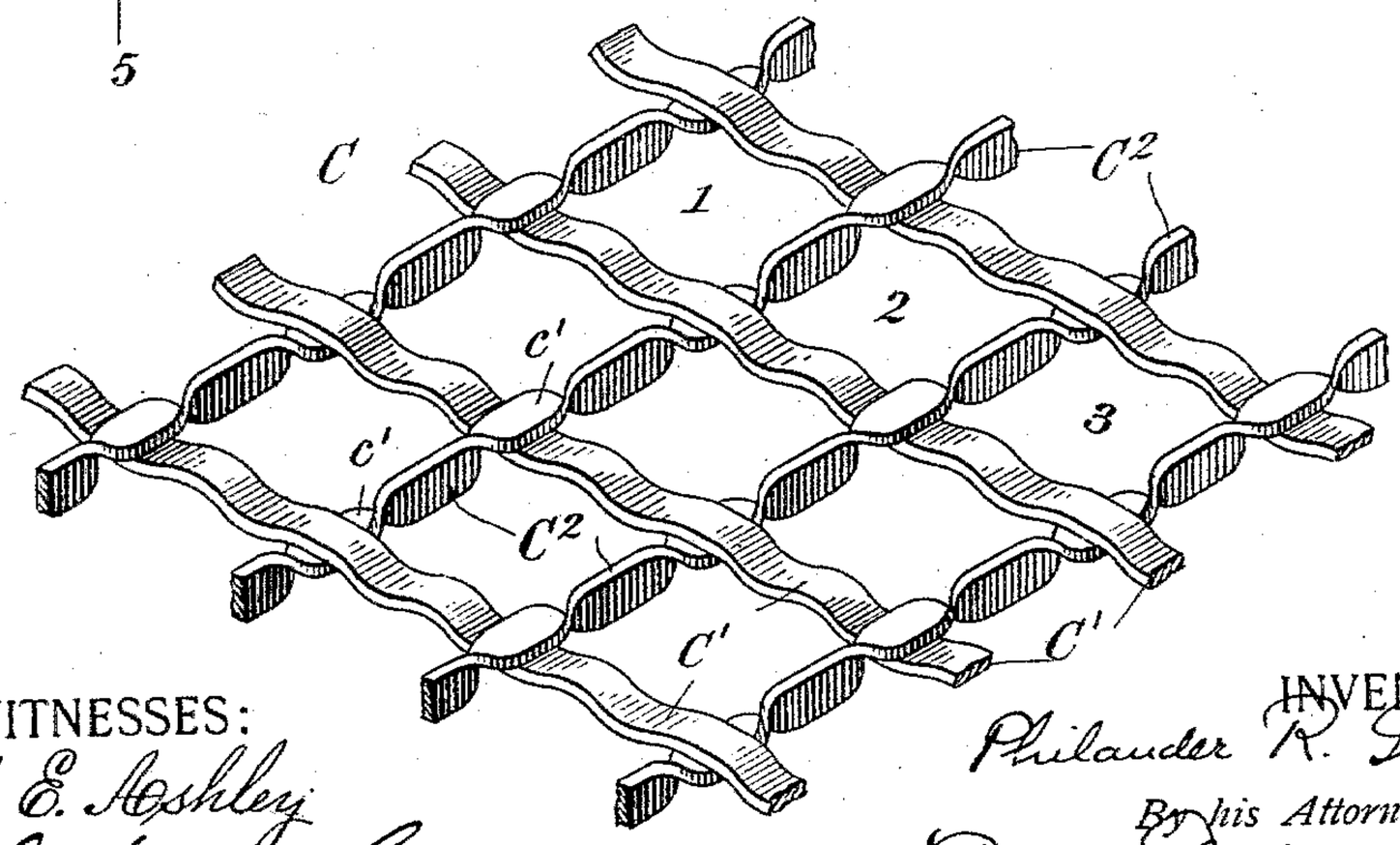


Fig. 3,



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UNITED STATES PATENT OFFICE.

PHILANDER R. GRAY, JR., OF ELIZABETH, NEW JERSEY.

FILTER-PRESS.

SPECIFICATION forming part of Letters Patent No. 596,995, dated January 11, 1898.

Application filed June 4, 1897. Serial No. 639,419. (No model.)

To all whom it may concern:

Be it known that I, PHILANDER R. GRAY, Jr., a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Filter-Presses, of which the following is a specification.

My invention relates to the construction of the plate, and its details are hereinafter set forth.

In the accompanying drawings, Figure 1 illustrates a filter-press plate, partly in elevation and partly in section, on the line 1 1 of Fig. 2; Fig. 2, a vertical section through such a plate on the line 2 2 of Fig. 1; Fig. 3, a view in perspective of a portion of the central member of my improved plate; Fig. 4, an elevation; and Fig. 5, a section therethrough on the line 5 5 of Fig. 4, showing another well-known type of plate constructed in accordance with my invention.

My invention relates to that class of filter-plates in which there is a central member of skeleton formation faced on each side by a perforated plate or member, the whole being inclosed by the usual filter cloth or sack.

The first part of my invention relates to the construction of the inner member of the three plates.

Referring to Figs. 1 and 2, A indicates a ring that may be of cast-iron and has the usual lugs *a* and an internal annular flange B. Within this flange and in the plane thereof is located the central member C of the plate, of a peculiar construction, hereinafter described. On each side of the member B is a perforated plate D, which extends over the inner flange B, to which the perforated plates are secured by rivets *d*. The usual central aperture of the plate is formed by a ring E, which occupies the central opening in the central member C and to which the perforated plates D are riveted, these plates also having central openings coinciding with that of the ring. Through the bottom of the ring A is a discharge-aperture F, leading into the space occupied by the central member C. At the top of the ring is a channel or opening G, connected by passage *g* with the interior space of the ring. Where spacing-rings are used between the plates, they will be formed with a similar channel or aperture G, the purpose being that the assemblage of plates shall thus have a duct or passage G opening to the interior of each plate for the introduction of steam, hot air, or such other medium as may be desired. This feature, however, forms no part of my present invention. The grille or center member of the plate is shown in detail in Fig. 3 and is composed of two series of interlacing flat bars. Those marked C′ are horizontal, while those marked C^2 are vertical. The horizontal bars C′ merely pass over and under the alternate vertical bars, which latter at each crossing are given a quarter-turn, as at *c′*, the parts of the vertical bars between these quarter-turns being flat and standing in planes at right angles to the planes of the perforated plates. Thus there are formed a number of vertical passages 1 2 3, &c., for the free descent of the oil or other fluid which the press is extracting, and which are of such character and dimensions as not to be liable to choke or fill up. Furthermore, the structure is one that affords great strength, since the pressure of the perforated plates is sustained upon the edges of the vertical bars C^2, which being locked by the interlacing horizontal bars C′ are prevented from breaking down or bending. This is the feature constituting the first part of my invention, and it will be perceived that it may of course be applied to plates of somewhat different character from that shown in Figs. 1 and 2. With the plates shown in Figs. 1 and 2 spacing-rings would be employed, and the spacing-rings may be dispensed with by making the ring A thicker or reducing the dimensions of the separating-bungs, which I will presently describe. Another form of plate to which this part of my invention is applicable and to which it is shown applied is illustrated in Figs. 4 and 5, which shows a flat ring A′, having the usual lugs *a′*. The grille or center member C is arranged within this ring and in the plane thereof, while the outer perforated plates or members are riveted to the sides of the ring. Spacing-rings may be employed with this form of plate, and of course whatever form the plate may be the usual filter-cloth (indicated by X in Fig. 2) is or may be employed. The construction of the center

member C possesses the advantages of being economical, of great strength, and affording ample vertical channels for the discharge of the liquid.

The next feature of my invention relates to the spacing bosses or hubs H, which may be located, as required, upon the faces of the plates. These bosses are constructed as follows: The section upon one side of the plate is squared exteriorly for the reception of a wrench and is tapped centrally for the reception of the threaded end of a bolt *h*, which passes through the plate through an aperture in the corresponding section of the boss on the other side of the plate, which is also squared exteriorly and has also a square or angular socket in which the angular head *h'* of the bolt is seated. With this construction of the spacing hubs or bosses they may obviously be clamped upon the plate very firmly with the greatest facility and may with equal readiness be removed and are at the same time of such strength and so applied as to resist the strains to which they are subjected. Of course the dimensions of these hubs may be such as to extend beyond the planes of the opposite faces of the ring, as shown in Fig. 2, or otherwise, and of course they may be applied to plates of the type indicated in Figs. 4 and 5, as well as to any forms of filter-plates where their use is required.

I claim as my invention—

1. In a filter-press, the combination of the two outer perforated plates and a central member consisting of interlacing horizontal and vertical bars, the horizontal bars being flat and having the planes of their faces of greatest dimensions parallel with the plane of the plate, and the vertical bars having flat portions parallel with the plane of the plate at each intersection, and between the horizontal bars flat portions standing at right angles to the plane of the plate, substantially as set forth.

2. In a filter-press, the combination of the two outer perforated plates and a central member consisting of interlacing horizontal and vertical bars, the horizontal bars being flat and having the planes of their faces of greatest dimensions parallel with the plane of the plate, and the vertical bars having flat portions parallel with the plane of the plate at each intersection, and between the horizontal bars flat portions standing at right angles to the plane of the plate, in combination with a ring or frame supporting the three members of the plate, substantially as set forth.

3. The combination with the supporting ring or frame and the outer members of a filter-press plate, of a central member consisting of two series of flat bars crossing each other at right angles, the bars of one series being given a quarter-turn at each intersection so that between such intersections their greatest dimensions lie in planes parallel with the axis of the press, whereas the bars of the other series between the intersections have their greatest dimensions in planes at right angles to the axis of the press.

4. The combination with the members of a filter-press plate, of a spacing hub or boss composed of two sections, each exteriorly squared for the reception of a wrench, one centrally tapped to receive a screw-threaded bolt, and the other having a square or angular aperture in its face to receive the square or angular head of the bolt, substantially as set forth.

In testimony whereof I have hereunto subscribed my name.

PHILANDER R. GRAY, JR.

Witnesses:
EDWARD C. DAVIDSON,
CATHARINE GEORGE.