

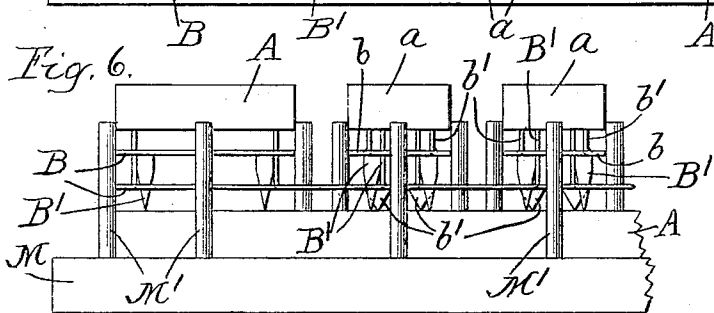
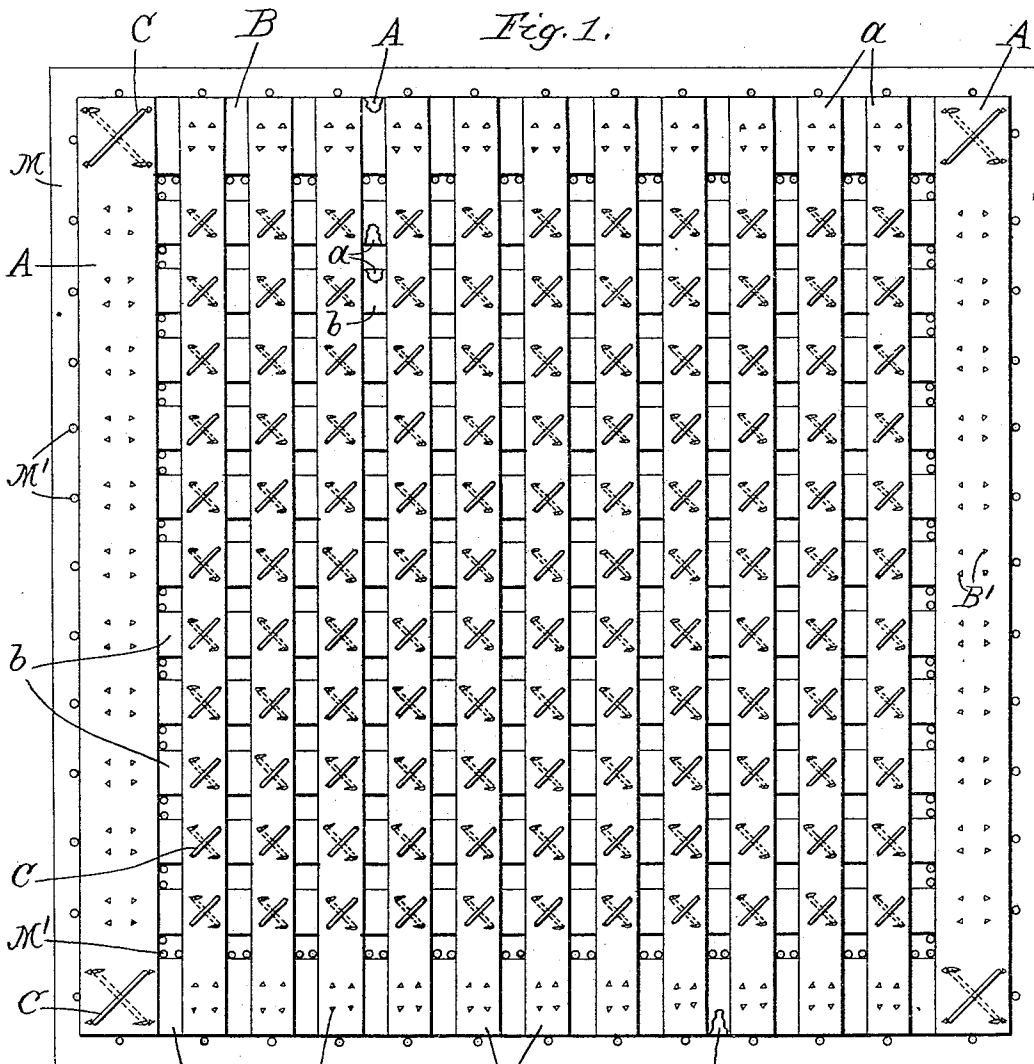
(No Model.)

2 Sheets—Sheet 1.

J. E. DAVIS.
RACK FOR PRESSES.

No. 569,547.

Patented Oct. 13, 1896.



Witnesses.

E. T. Wray.

Jean Elliott

Inventor.

Jerome E. Dairs
by ^{and} Burton & Burton
his attys.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

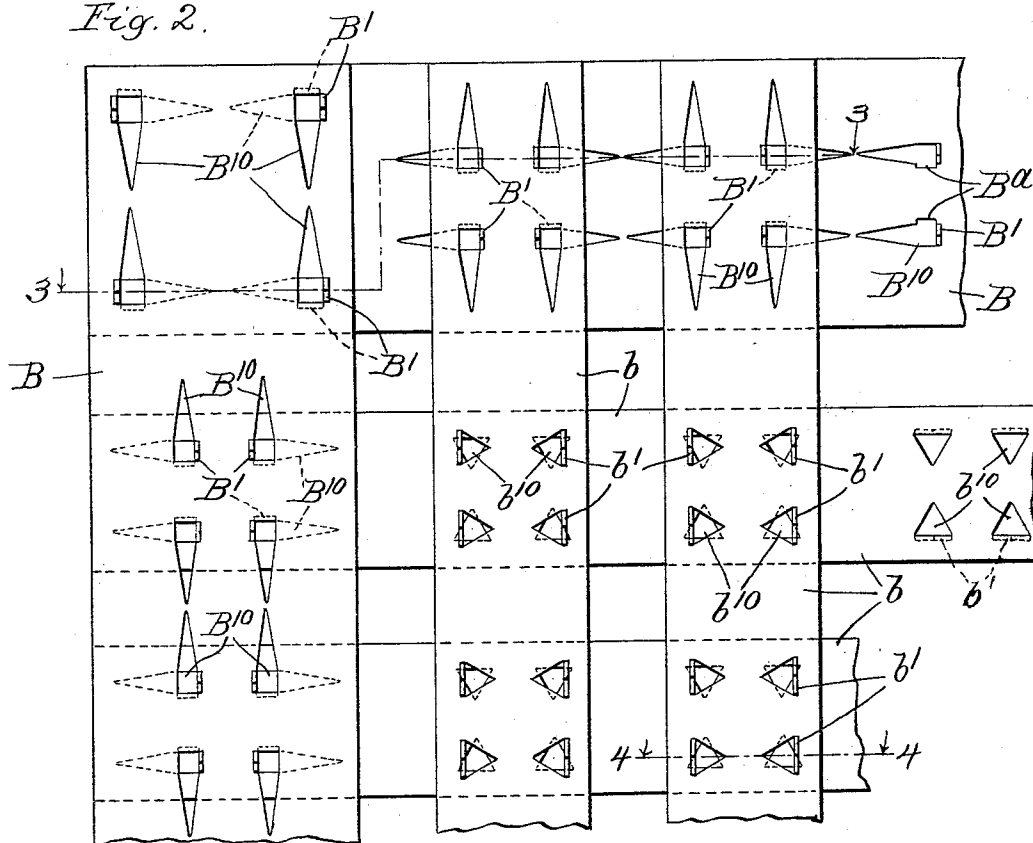


Fig. 3.

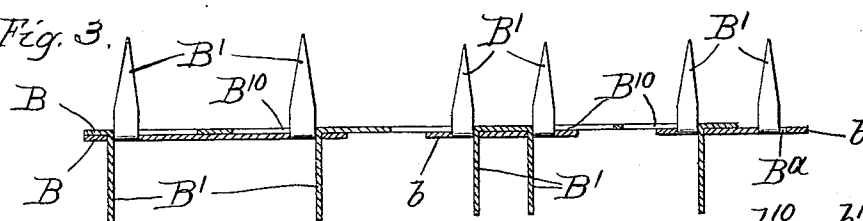
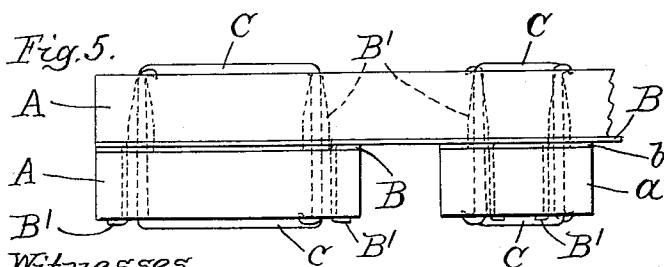


Fig. 5.

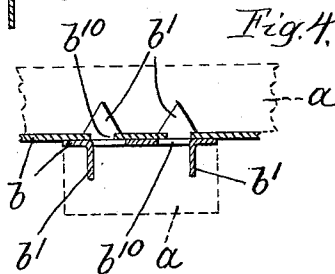


Witnesses.

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Fig. 4.



Inventor.

Jerome E. Davis
by Burton & Burton.
his attys.

UNITED STATES PATENT OFFICE.

JEROME E. DAVIS, OF OAK PARK, ILLINOIS.

RACK FOR PRESSES.

SPECIFICATION forming part of Letters Patent No. 569,547, dated October 13, 1896.

Application filed November 25, 1895. Serial No. 570,056. (No model.)

To all whom it may concern:

Be it known that I, JEROME E. DAVIS, a citizen of the United States, residing at Oak Park, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Racks for Presses, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates to racks used in presses to separate and retain the bags or straining or filtering cloths in which pulp or other liquid or semiliquid material is inclosed for the purpose of pressing the liquid therefrom through the filtering-cloths in a manner which is well understood and familiar in the art.

The invention consists in improvements in the form and means of fastening together of the wooden and metal bars which compose the rack, as more particularly set out in the claims.

In the drawings, Figure 1 is a plan of my improved rack having some of the wooden bars partly broken away to show other details of construction. Fig. 2 is a detail plan of one corner of the rack having the upper wooden bars removed. Fig. 3 is a section at line 3 3 on Fig. 2. Fig. 4 is a section at line 4 4 on Fig. 2. Fig. 5 is a detail edge elevation of two intersections. Fig. 6 is a detail elevation showing a mode of assembling and forcing the parts together in a press.

Two difficulties have been experienced in the use of racks of this class and for the purpose indicated. First, the pressure, amounting sometimes to several hundred pounds per square inch, to which the racks are subjected in use being experienced by the intersecting bars chiefly at their surfaces in contact where they cross, and operating at those surfaces with a crushing tendency, operates with a shearing tendency at the edges of the intersections, causing each bar to tend to cut off the bars which it crosses. In addition to this shearing strain a second difficulty arises from the fact that the pressure to which the semiliquid contents of the bags or filtering-cloths is exposed being transmitted equally in all directions, according to the law governing the transmission of pressure in liquids, operates with lateral pressure upon the several bars of the frame because the cloths sag between

them. This lateral pressure tends, first, to cause the bars to separate laterally, and in order to do so either to tear away from the fastenings employed at their intersections, or, second, to stretch and ultimately rupture the transverse bars by the longitudinal strain. Both effects are observed in practice, and ultimately the wood of the several bars in each direction, becoming weakened by the soaking and drying to which it is subjected, gives away, apparently under the longitudinal strain due to the pressure exerted laterally against the transverse bars. I seek in my improved rack to overcome both these effects; and my invention consists in the details of formation of metal bars with which the wooden bars are lined or faced and the mode of attaching the several bars together at their intersections, as hereinafter explained, and particularly set out in the claims.

It is desirable to make such racks with the metal bars of heavier material than can be readily penetrated by a nail which might be driven through the bars at their intersection to secure them together in a manner now customary in making such racks. It is also desirable to secure the racks at their intersections by at least two penetrating points, rather than by one only, since thereby the racks are prevented from being distorted, as they are liable to be when only one nail or other securing device is inserted at each intersection; and the most desirable form of securing device for this purpose is a staple or double-pointed nail penetrating both the bars at their intersection, and even when the lighter strap-iron is used for the metal strips it is difficult to drive the double-pointed nail or staple through such metal strip without having previously perforated the strip for the purpose. In order to manufacture such racks rapidly, as they must be in order to be made as cheaply as necessary, not only must the process of perforating the strips be as cheap as possible, but the perforations must be such and so placed that they shall with certainty register with each other where the strips cross, else the nails will have to be forced through one or the other strip, even though entering the perforations in one of them. It is also important that the location of the perforations should be positively known, notwithstanding

the fact that they are covered or hidden entirely by the wooden bars at the time the nails are driven, so that the operator may start the nails in the wood at the proper point to pass through the apertures in the metal after the wood is penetrated. It is also desirable, in order to rapidly manufacture such racks, that the assembling of all the bars properly crossing each other should be rapidly done and the position of all the bars thus assembled easily maintained while the nails are driven successively at the intersections, so that it may not be necessary to secure the intersections as fast as the bars are placed, which necessitates alternating the process of placing them with the process of nailing them, which is inconsistent with the most rapid work.

It is also an important feature of my invention that the metal bars of each series are respectively stopped laterally on the metal bars of the other series; that is, so that a tendency to move laterally under the lateral-transmitted pressure above referred to shall be checked and not transmitted to the fastenings of the bars in the wood. With all these requirements in mind the purpose of the details of my invention, which I will now describe, may be appreciated.

In the drawings I have shown in one rack several variations of the devices by which the metal bars are secured to the wooden bars and stopped with respect to each other. In all the various forms, however, the essential principles are the same, though some of the forms are effective for all the purposes above specified, while others are effective for only a portion of the purposes.

A A and a a are the wooden bars of a rack, which are arranged in two series of parallel individuals, said two series crossing each other at right angles. B B and b b are metal bars with which the bars A A and a a, respectively, are faced on their inner surfaces. In the rack shown, though not necessarily for the purpose of my invention, the outside bars A A and B B are wider than the intermediate bars a a and b b. I take advantage of this circumstance merely to illustrate in one rack certain minor variations in the mode of forming the fastenings, as will hereinafter appear; and I desire to have it understood that any one of the fastenings shown in this rack might be employed through the entire rack, if in any case it should be considered desirable to have at every intersection all the advantages of the best and most complete form of fastening, or if it should be considered unnecessary at any intersection to have all said advantages. In all the forms of fastening the metal bars are apertured at suitable points for fastening nails or staples, so that such fastenings may be employed wherever desired, the apertures being made by striking up the metal in the form of a tang or lug which remains integral with the metal at one edge of the apertures.

b' b', &c., are such tangs in one of the forms used, b¹⁰ b¹⁰, &c., being the apertures produced by striking up such tangs or lugs b' b', &c. As shown, and preferably, these and all other tangs and lugs illustrated, are struck up a little distance back from the lateral edges of the strips, so that the apertures are not mere notches in the edges, although the device would be efficient to a large degree, even though the apertures should extend to the edges of the strips and become thereby mere notches. B' B', &c., represent tangs of a modified form, adapted to be employed in a slightly-different way, as will hereinafter be described, but having the same general purpose—to wit, producing apertures B¹⁰ B¹⁰, &c., in the metal and a tooth or tang integral with the metal adapted to be driven into the wood. The tangs or lugs b' b', &c., are designed not to penetrate the wood, but only to enter it and form fastenings of the metal strip to the wood bar which it faces, and this form of lug is therefore struck up from the metal bar with its base or undetached edge parallel with the edge of the bar, and therefore with the grain of the wooden bar into which it is to be driven, so that it has the least possible tendency to split the wood. The tang or lug B' is designed not only to secure the metal bars to the wooden bars, but also in addition to assist in securing the two transverse series of bars together in the form of a rack, and these tangs are designed, therefore, to be driven not into the wooden bars to which they are applied lengthwise, but into the wooden bars which cross the former, and they are designed, moreover, not merely to enter said wooden bars, but to penetrate them and be clenched on the opposite side. These tangs B¹⁰, therefore, are struck from the metal bars with their base or undetached edge transverse to the length of the metal bar, so that it will be parallel with the grain of the transverse wooden bar which the tang is to penetrate.

It will be understood from the foregoing description that the tangs B', since those pertaining to each metal bar protrude in the direction to penetrate a transverse wooden bar, must penetrate also the transverse metal bar; and they are so formed and located, therefore, that they may pass through the apertures in the transverse metal bars which are produced adjacent to and in the process of forming the corresponding tangs of the transverse metal bars. Inspection of Fig. 2 will make it apparent that in order that the metal bars may be formed all alike and assembled with their tangs respectively protruding from each series toward the transverse series and through the apertures in the transverse series said apertures must include a recess B³ in the aperture produced by the striking up of the metal to form the tang. Such notch or addition to the aperture B¹⁰ is readily formed by the same stroke by which the tang itself is cut and struck up, as will be understood by

mechanics familiar with that art; and my invention not being concerned with the mode of producing the tang, the form of die and punch necessary for the purpose need not be

herein set forth.

Preferably, for reasons which will be stated, but not necessarily for the main purposes of my invention, the tangs B' B' are struck from the metal bars in such manner as to leave two apertures which are in a longitudinal line parallel with each edge of the bar at each of the intersections, such apertures extending from the bases of the two tangs, respectively, toward each other; that is, the metal for the tangs is struck out of the "lap" of the metal bar on its intersecting bar, rather than out of the metal beyond the lap, as it conceivably might be. The objection to the latter formation is that since the tangs of this form are longer than the distance of their bases back from the edge of the transverse bar which they penetrate the apertures left by cutting them would extend across the shearing-line, that is, past the edge of the intersecting metal bar, if the tangs were not struck out of the lap metal. In case of narrow bars it may not always be possible to preserve this advantage, and it is pointed out merely because it is desirable when possible; but in the transverse bars *b* shown the tangs are cut projecting away from each other.

The mode of assembling and fastening the bars of racks embodying the invention as above described is seen in Fig. 6, wherein the metal bed of a press of size corresponding to the rack is employed as a nailing-bed. Such bed is shown at M in Fig. 1.

M' M', &c., are pins assembled and inserted in marginal rows in the bed M in position to permit the bars of the rack to be lodged between them, respectively, as seen in the drawings. The order of assembling the parts would be: First, the lower series of the wooden bars A *a* will be placed on the bed between the proper pins determining their position; second, the lower series of metal bars B *b* will be distributed between the pins above the wooden bars, respectively. The tangs *b'* of these bars will at this stage rest point downward upon the upper surface of the wooden bars; third, the upper series of the metal bars will be placed transversely with respect to the lower series, the tangs B' of each series passing through the apertures B¹⁰, and, specifically, through the notches B^a in said apertures of the other series. The metal bars will thereby be located and retained accurately at their intersections with each other independently of any other means, since they are prevented from sliding at their intersections by the engagement of the tangs B' of each in the apertures B^a of the other. Next the upper series of wooden bars will be put into position. They will rest upon the upwardly-projecting points of the tangs *b'* of the upper series of metal bars. The head of the press being now brought down upon the assembled rack and

proper pressure applied, the entire rack will be pressed together, the long tangs B' being first forced into the wooden bars which they are designed to penetrate, and when the wooden bars have been thus forced toward each other far enough the shorter tangs *b'* will be driven into their respective wooden bars, and the pressure still continuing, the long tangs being driven entirely through the wooden bars, will be clenched down upon the opposite sides, and the rack, when the pressure is finished, will not only be assembled, but securely fastened together. The apertures in the metal bars of the two series, respectively, register with each other, and double-pointed nails or staples C C, &c., will be driven at all the intersections requiring such further fastenings. They are shown in the drawings as applied to all the intersections, including those which would be already securely bound by the interlacing and clenched tangs B'; but it may not always be considered necessary to employ them in addition to such tangs. When, however, the tangs are of the form *b'*, the staples are necessary. For very strong racks staples may be driven from both sides, as illustrated; for it will be observed that there are four apertures through each of the metal bars at each intersection, located at the four corners of a square which is centrally located within the square lap of the bars upon each other, and a staple may be set through from each side diagonally with respect to such square, the points of each staple being formed to clench upon the opposite side inward and crosswise of the grain upon the wooden bar upon which it is clenched.

It will probably be understood without special mention that the use of the metal sheathing-strips of the form and having the purpose shown is not limited to their association with wooden bars, for any other material than wood, subject to the same objections or involving the same defects when used alone, would offer the same occasion for the use of the metal reinforcing-bars to offer by their tensile resistance protection against rupture of the rack by reason of their laterally-transmitted pressure and to afford by their transverse resistance to shearing protection against the danger of shearing off the strained bars by reason of the direct cutting-pressure to which the rack is subjected in use. Bars of vulcanized or indurated rubber in different forms and probably other material suitable for use in the manufacture of racks may be considered as equivalents of wooden bars for the purpose of this invention, and the term "wooden" used in my claims is designed to include all material which is equivalent to wood in requiring reinforcement for the purposes specified.

I claim—

1. A rack for presses comprising in combination, wooden bars sheathed with metal strips on their inner or facing surfaces; such

metal strips having lugs struck from their substance projecting from their faces forming apertures through the metal strips; the nails which secure the parts together being
5 driven through the wooden bars and passing the metal strips at such apertures substantially as set forth.

2. A rack for presses comprising in combination two transverse series of wooden bars;
10 metal strips with which the bars respectively are armored at their inner faces; said metal strips having tangs struck from their substance projecting from their faces forming apertures in the strips; said tangs being
15 driven into the wooden bars, the two series of armored bars being assembled with the apertures of one series registering with the apertures of the other series at their intersections, and nails or staples which secure said series
20 together driven through the wooden bars at such registering apertures in the metal strips.

3. A rack for presses comprising wooden bars arranged in two transverse series, in combination with metal strips with which
25 such bars are armored on their faces; said bars having tangs struck from their substance and projecting from their faces; said tangs being adapted to penetrate the wooden bars respectively and thereby to indicate the location of the apertures formed in the metal
30 strips by striking up such tangs, and the staples or nails which secure the parts together driven through the wooden bars at the location of said apertures.

35 4. A rack for presses comprising in combination wooden bars sheathed with metal strips on their inner faces, such strips having lugs

struck from their substance projecting from their faces; apertures in the strips adjacent to the lugs; the strips being assembled with the lugs of each series projecting toward the transverse series and into the apertures thereof, whereby the metal bars of each series are laterally stopped on the transverse metal bars respectively.

5. A rack for presses in combination, wooden bars arranged in two transverse series and metal strips which sheath the inner faces of such bars; the metal strips having tangs struck from their substance and projecting from their faces and apertures adjacent to the roots of such tangs; the strips being assembled with the tangs of each series of metal bars projecting toward the transverse series and into the apertures thereof, thence into the opposite wooden bars, whereby the tangs of each metal strip secure it to the transverse wooden bar and stop it laterally on the transverse metal bar and the two transverse series of bars are secured together at their intersections by the lap of the metal bars.

6. A rack for presses comprising bars faced with metal as described, the tangs struck from the metal bars at the intersections being made from the lap metal and folded up away from each other.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 21st day of November, 1895.

JEROME E. DAVIS.

Witnesses:

CHAS. S. BURTON,
JEAN ELLIOTT.