(No Model.)

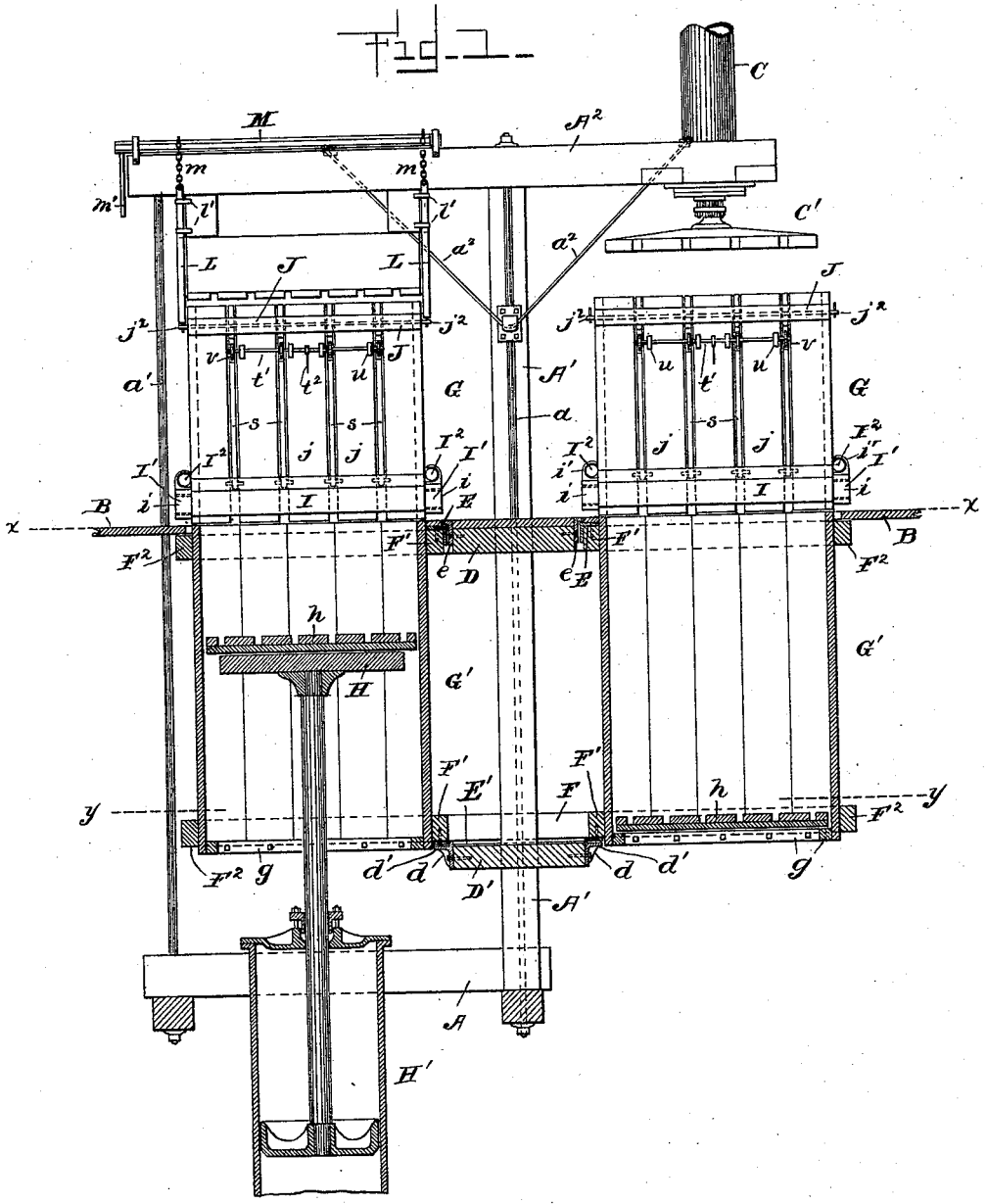
4 Sheets—Sheet 1.

W. S. LIDDELL.

COTTON PRESS.

No. 522,220. Patented July 3, 1894.

Fig. 1.



WITNESSES:

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ATTORNEYS.

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Fig. 2.

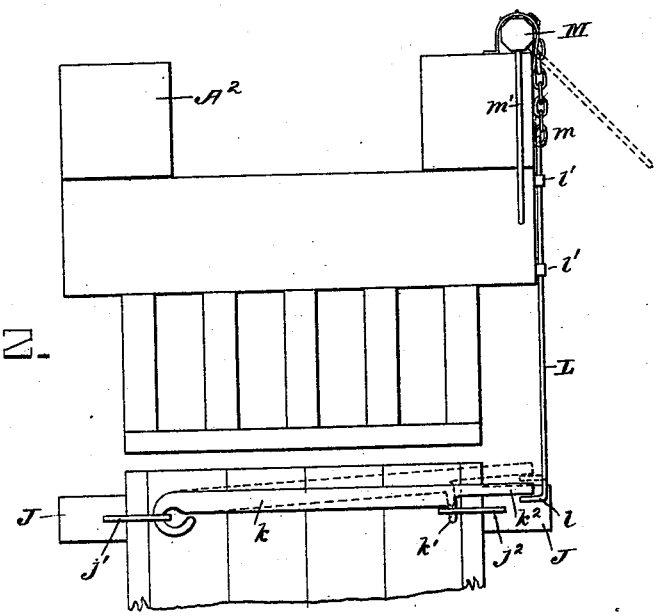
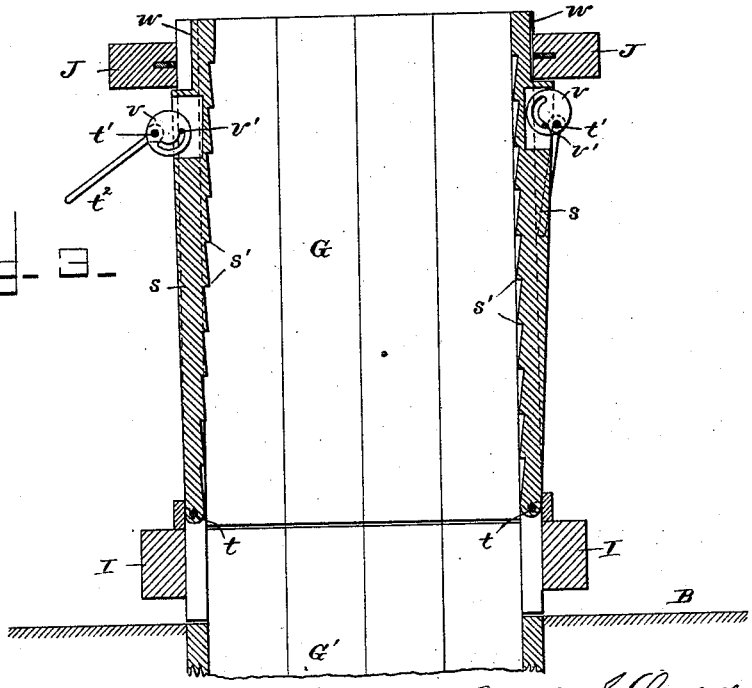


Fig. 3.



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(No Model.)

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W. S. LIDDELL.

COTTON PRESS.

No. 522,220. Patented July 3, 1894.

Fig. 4.

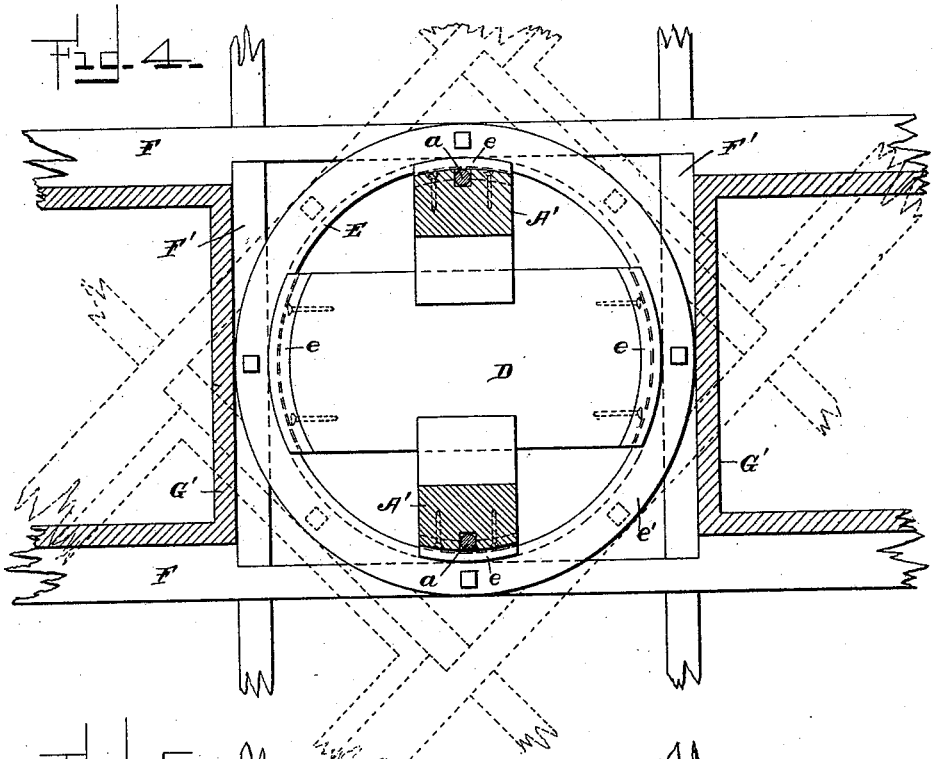
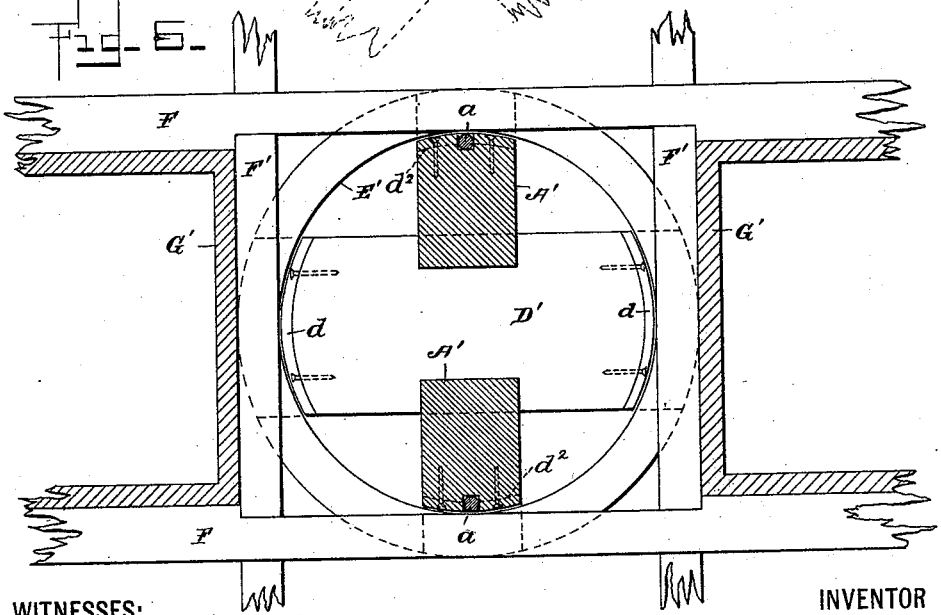


Fig. 5.



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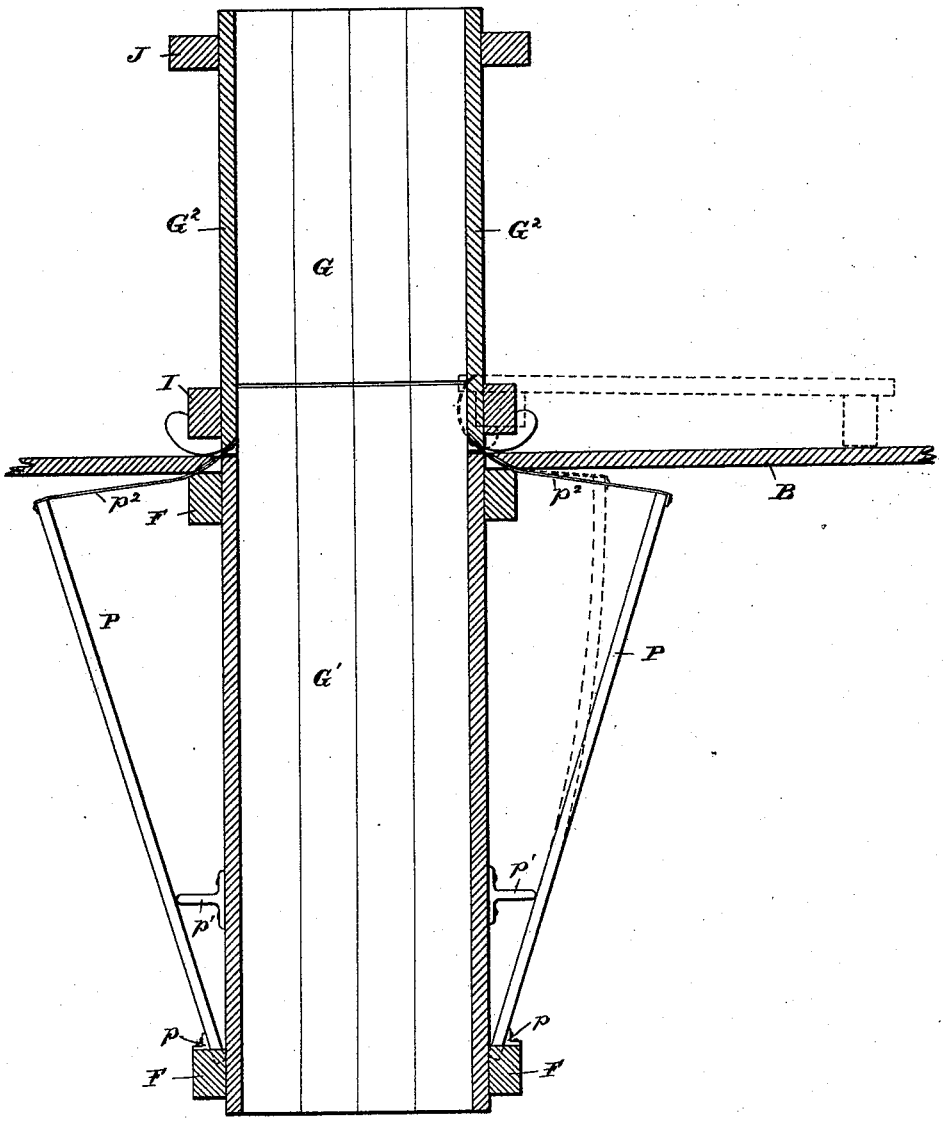
(No Model.) 4 Sheets—Sheet 4.

W. S. LIDDELL.

COTTON PRESS.

No. 522,220. Patented July 3, 1894.

Fig. 6.



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UNITED STATES PATENT OFFICE.

WALTER S. LIDDELL, OF CHARLOTTE, NORTH CAROLINA.

COTTON-PRESS.

SPECIFICATION forming part of Letters Patent No. 522,220, dated July 3, 1894.

Application filed March 14, 1894. Serial No. 503,624. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. LIDDELL, a citizen of the United States, and a resident of Charlotte, county of Mecklenburg, and State of North Carolina, have invented a new and useful Improvement in Cotton-Presses, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to a novel construction of the press frame and press boxes, with a view to compactness of arrangement, facility of handling and the securing of the requisite strength of the various parts, and will be understood from the following description and claims, reference being had to the accompanying drawings, in which—

Figure 1 represents my improved press with the upper press boxes and upper part of the press frame in side elevation and the lower boxes and lower part of the frame and the steam cylinder in section. Fig. 2 shows the upper end of one of the upper boxes and the upper part of the press frame in end elevation, and Fig. 3 is a transverse, vertical section through one of the upper boxes. Fig. 4 shows a horizontal section on the line *x*—*x*, Fig. 1, and Fig. 5 a similar section on the line *y*—*y*. Fig. 6 is a vertical section through the press box, showing the springs for cushioning or counterbalancing the press box doors.

A indicates a strong, rectangular, base frame, which, in practice, may be supported on any suitable foundation, and upon which, at one side, are secured two strong uprights A′, which pass up through an opening in the flooring B of the press room, and have a strong, rectangular frame A^2, secured to their upper ends, by long, through bolt rods *a*, *a*, similar rods *a*′, connecting one end of the frame A^2 with the opposite side of the base frame, as shown. The opposite end of the frame A^2, extends beyond the upright timbers A′ and supports, at its end, the packing, steam cylinder C. The rods *a*, *a*, are let into vertical grooves in the outer faces of the uprights A′, as shown in Figs. 4 and 5 and from said uprights, diagonal brace rods a^2, a^2, extend upward toward the projecting ends of the frame A^2, to which they are secured, thereby materially stiffening and strengthening said frame and giving it the truss form shown.

The uprights A′, are notched or grooved transversely on their inner adjacent faces, at the floor (B) line, and at the lower ends of the press boxes, to receive horizontally arranged planks or timbers D and D′, the outer ends of which, as also the outer faces of the uprights A′, in the same plane therewith, are rounded in arcs of a circle, for a purpose which will appear. To the plank D′ are secured curved angle irons or plates *d*, *d*, one at each end and conforming to the curvature thereof and having, near their upper edges, horizontal flanges *d*′, and, to the posts A′ similar flanged irons d^2, are secured, a ring E′ resting on the horizontal flanges of said plates, the vertical portion of which extends above the flange *d*′ forming a curved rim or rib, extending up inside the ring E′ to form a bearing for and prevent displacement of the ring. Plates *e*, *e*, are secured to the upper timber D and to the uprights A′ in the same plane therewith, similar to the plates *d*, except that the upwardly projecting rim or rib is not required. The horizontal flanges resting upon a ring E, having an annular flange *e*′ on its upper edges and said ring being secured to the girders F, F′, which unite the press boxes, prevents them from rising when the bale is being compressed, by coming in contact with the lower sides of the horizontal flanges of the flanged plates *e*, *e*, while the vertical flange or part of the ring rests pendent against the inner curved face of said plates.

To the upper face of the ring E′, and to the lower face of the ring E are firmly bolted the press box frame timbers F, F, and F′ F′, the last named crossing the timbers F, at right angles, as shown and properly framed together to bring those of each series into the same horizontal plane, to receive the rings E and E′, bolted thereto. The bars or timbers F, F, extend beyond the points of intersection with the bars F′ to form the side frame bars to the press boxes and are united at their outer ends by bars F^2, forming the outer or end frame bars to said boxes, as indicated in Fig. 1.

The press boxes are made, each, in two parts, the upper part of each being indicated

at G and the lower part at G′. The latter is preferably made solid; that is to say, the four sides thereof are secured permanently to the press box frame timbers, the boards forming the same, terminating at or near the level of the flooring B, as shown in Fig. 1. To the lower ends of these side boards, on their inner faces, cleats g, g, are secured, adapted to receive and uphold a bottom board, h, of suitable construction to permit the tying of the bale, and to move up through the press chamber, actuated by the platen or follower H, connected with the piston rod of cylinder H′, as indicated in Fig. 1.

The upper part of each press box has the lower frame timbers I, of its sides, or front and rear, provided with round tenons, indicated by dotted lines at i, which are journaled in sockets, in the end, lower bars I′, and which thus permit the side or front and rear doors, composed of upright boards, secured to said bar or timber I, to swing outward and down, until they rest on the floor, as indicated by dotted lines in Fig. 6. The end boards of the box G are secured in like manner to a rod or bar I^2, pivoted in eye brackets i', on the bars I′, and this permits the end walls or doors of the chamber to be also swung outward and downward, entirely freeing the bale for permitting its removal.

The upper side door battens J, J, at the front and rear of the upper part of the press boxes have the boards j, j, rigidly secured to them and are channeled on their inner sides to receive the iron bars j' j^2 having a rectangular hook at each end, the hooks on the rear bar j' having latch bars k hinged to them as shown in Fig. 2. The other ends of the bars k have pendent spurs k' or hooks formed on them, which, when the doors are closed, engage the loops on the ends of the forward bar j^2 and so lock all the doors in their closed position, the inner edges of the hooked bars j' j^2, preventing the end doors from opening, while the hooks are engaged. The free or swinging ends of the latch bars have each, a projecting tongue k^2, which, when the doors are all closed and latched, or locked, overhangs a spur l on the pendent rod or bar L, sliding in loop bearings l', on the upper frame bars A^2. The upper ends of these sliding bars are connected by cords or chains m, with a windlass or rolling bar M, by rotating which, by means of a hand lever m', the attendant can readily raise the swinging ends of the latch bars and so release and unlock the doors, which, by the pressure of the cotton, will be instantly, all thrown open, in a manner that will be readily understood.

For cushioning the fall and counterbalancing the weight of the side doors G^2, G^2, (see Fig. 6) spring bars P, P, are secured at their lower ends to the lower box frame bars F, by means of suitable brackets p, as shown, and are held inclined outwardly, away from the boxes, by suitable bridges p' p'. These spring bars may be made of wood, steel or other suitable material and have straps or cords p^2, attached to their upper ends and extending inward under the lower ends of the doors G^2, to the bottoms of which, at their inner faces, said straps p^2 are attached. By this arrangement, as the doors are thrown outward and downward, the straps are made to draw the spring bars inward, as indicated in dotted lines, thereby increasing the tension on said bars and cushioning the fall of the doors. The spring bars also facilitate the closing of the doors after the bale is removed.

The hinged sides or side doors G^2, have the upright wall boards separated slightly or provided with vertical slits in which is located a series of narrow bars s, serrated or having teeth s' on their inner edges, which teeth are inclined on their upper faces and square shouldered on their lower faces, as shown in Fig. 3. These bars are preferably made tapering toward their lower ends, which are secured to fixed pivots t, fastened to the wall boards. Near their upper ends the wall boards have eye-brackets u, secured to their outer faces and in said brackets a rock shaft t' is mounted, provided with an operating handle or lever t^2. This rock shaft has a series of slotted, cam disks v, fast on it, arranged in the same vertical planes with the serrated slots or bars s, and connected therewith by pins at v', passing through the slots in the cam disks and fastened to the bars s. The cam disks and their slots being eccentric to the rock shaft, when the latter is rocked, the upper ends of the serrated bars can be swung inward for engaging and holding down the cotton as it is forced downward and packed within the press box, or outward for releasing the cotton and facilitating its upward movement and compression by the compressing piston.

Where the bars s are made tapering, their extreme upper ends, on their outer edges, may be cut away as shown at w, to provide for the outward movement, necessary to free the cotton, as explained.

The packing of the cotton in the press box, is effected by means of the platen C′, operated by the piston rod of the cylinder C, to which steam is admitted, as in the patent to W. J. F. Liddell, No. 381,263, dated April 17, 1888, or in any other convenient manner, and after being thus packed, the press box, so filled, can be swung around over the pressing cylinder H′, the empty box being at the same time swung into place under the packing cylinder C, to be filled, while the cotton in the full box is being forced upward and compressed into and within the upper part G of the press chamber, by the follower H connected with and operated from the steam cylinder H′, to which steam is conveyed in any suitable manner.

The upright frame posts A′, A′, in connection with the four, through rods a, a, and a' a', connecting the upper with the lower or base frame and the manner of bracing the

upper frame, as described, give great strength to the machine frame, and the rings connecting the press box frame with and passing around the posts A′, and rods *a*, *a*, give an extended and very stiff bearing to the press box frame, carrying the press boxes swinging around said posts and rods as explained.

By mounting the ratchet bars *s*, on fixed pivots and swinging their upper ends in and out, they are given an inwardly inclined position, when thrown inward, in which they are found most effective for holding down the cotton as it is forced past the teeth by the packer C′, and, can be readily withdrawn, without tearing the cotton fiber.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a cotton press, the base frame A, the upper frame A^2, the parallel uprights A′, A′, connecting the base and upper frames, the segmental guide plates secured to and the planks D, D′, interposed between said uprights and having the segmental bearing plates, in combination with the press box frame, having the open, rectangular center, through which the frame uprights A′, A′, pass and provided with the rings E and E′ bearing on the segmental guide plates, substantially as and for the purpose described.

2. In a cotton press, the base frame A, the upper frame A^2, the parallel upright timbers A′, A′, the planks D, D′, interposed between said uprights and the flanged, segmental plates, secured to said uprights and interposed planks, in combination with the swinging press box frame, pivotally supported on said uprights and interposed planks and having the open, rectangular, central space, through which the upright timbers pass and the rings connected to said press box frame and bearing on said flanged plates, substantially as described.

3. In a cotton press, the machine frame composed of the base frame A, the top frame A^2, the parallel upright timbers A′, A′, the interposed, connecting planks D, D′, the segmental bearing plates *d* and *e*, on said planks and uprights, the through bolt rods *a*, and the lateral braces a^2, in combination with the press box frame, extended around said uprights A′, A′ and supported by rings E and E′, on the segmental bearing plates, and having the central, rectangular space, through which the uprights pass, the press boxes carried thereon, and the compressing and packing, steam cylinders, all arranged substantially as and for the purpose described.

4. The press sides or doors hinged at their lower ends and provided with the latch bars and hooks or eyes for locking said doors in their closed position, in combination with the sliding bars L, provided with spurs *l*, engaging tongues l^2, on the latch bars and the rock shaft or windlass connected to the machine frame and the sliding bars operated by said windlass for lifting the latch bars, to release the doors, substantially as described.

5. The upper press chamber sides or doors, pivoted at their lower ends, in combination with the spring bars located below the plane of the upper press boxes, and connected to said doors by straps for counterbalancing their weight, cushioning their fall and facilitating their closing, substantially as described.

In testimony whereof I have hereunto set my hand this 6th day of March, A. D. 1894.

WALTER S. LIDDELL.

Witnesses:
J. L. CHAMBERS,
FRANK F. JONES.