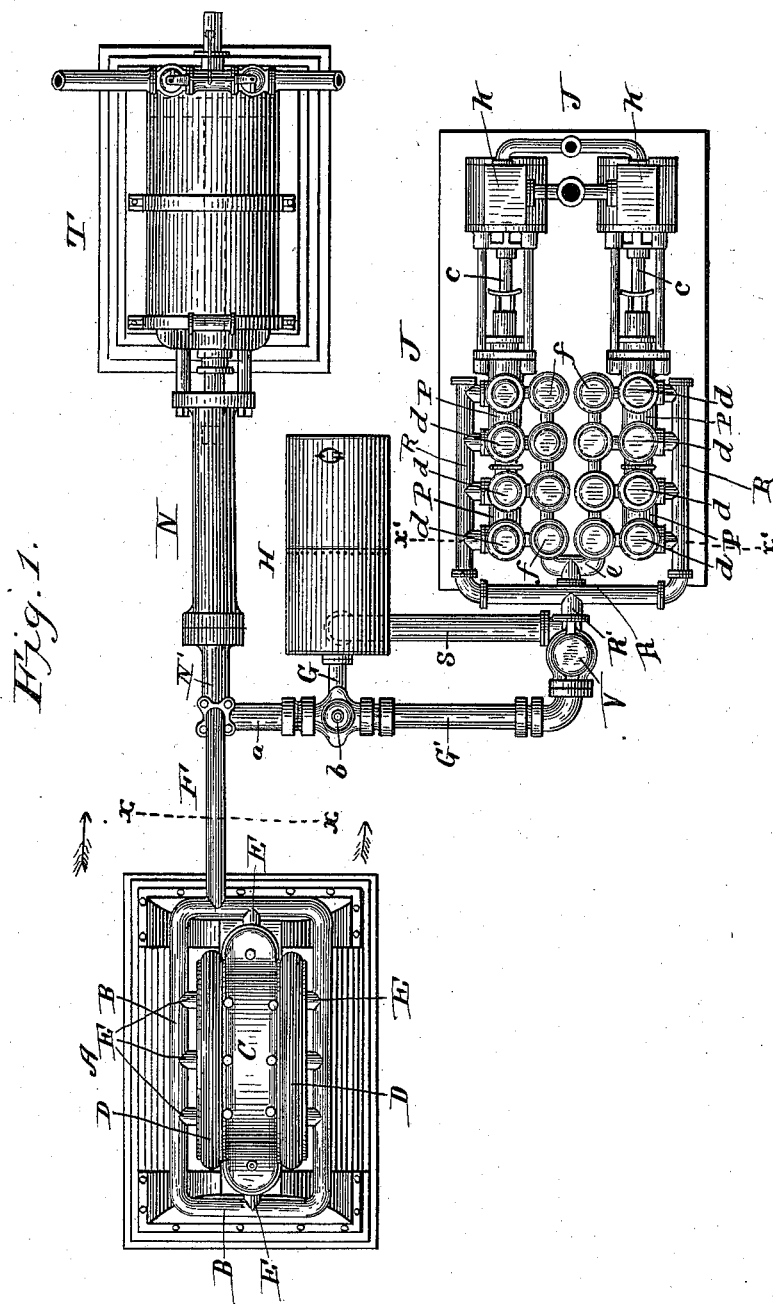


L. MILLER.

COTTON PRESS.

No. 385,193.

Patented June 26, 1888.



Witnesses.
Chas. H. Davis
John S. Finch Jr.

Inventor,
Lewis Miller.
By his Attorney
C. W. Alexander

(No Model.)

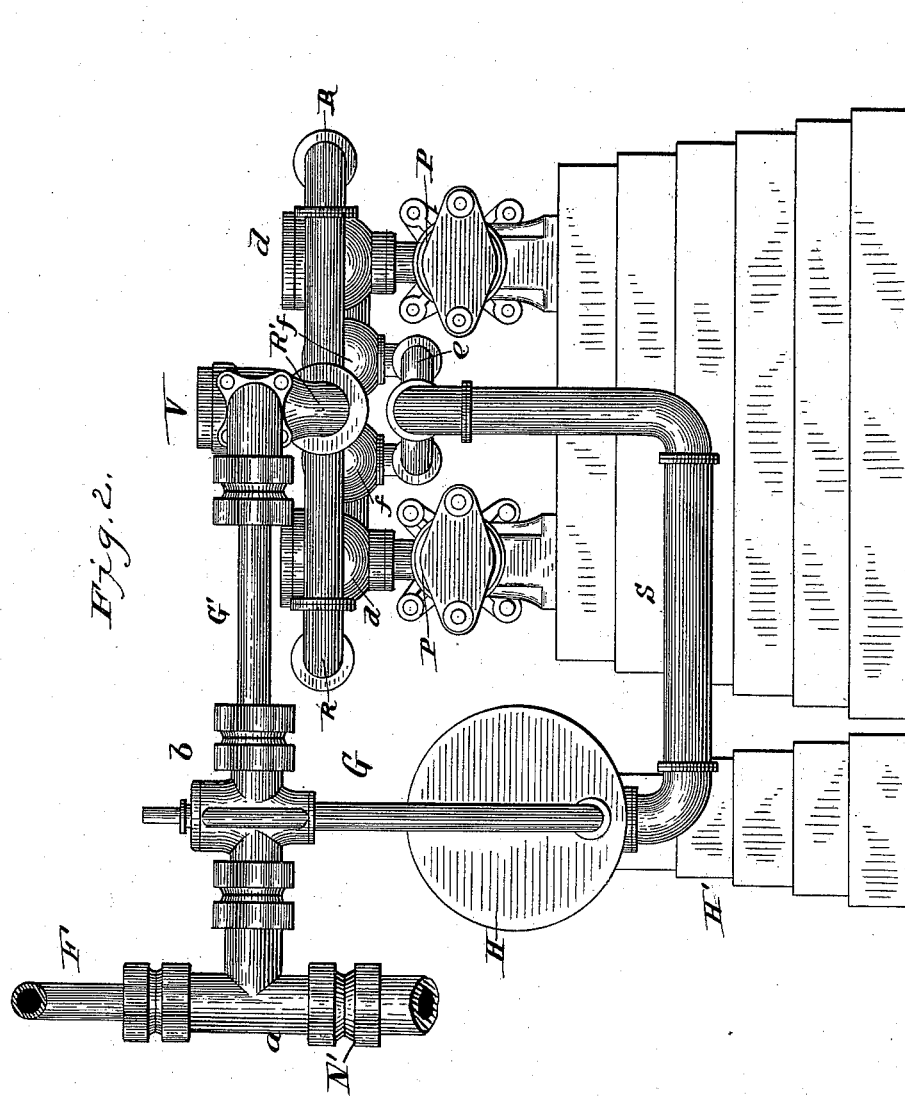
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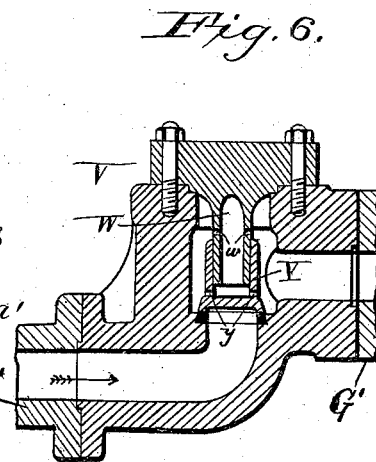
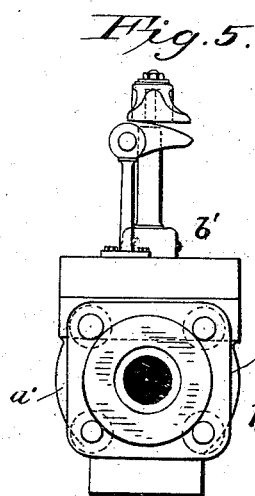
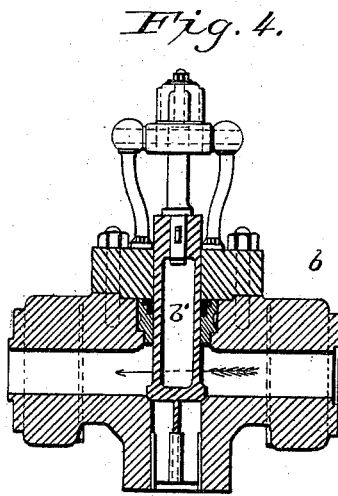
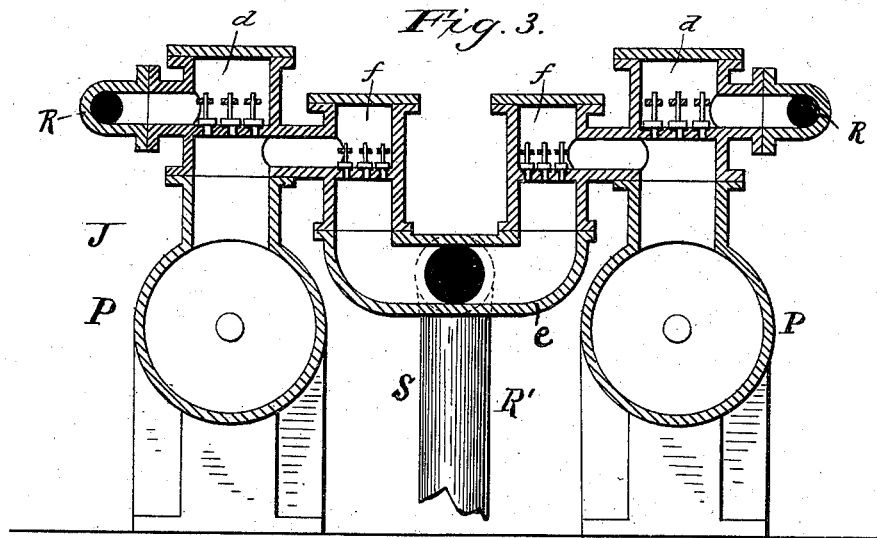
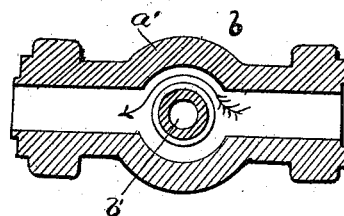


Fig. 7.



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Charles Davis.

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UNITED STATES PATENT OFFICE.

LEWIS MILLER, OF PHILADELPHIA, PENNSYLVANIA.

COTTON-PRESS.

SPECIFICATION forming part of Letters Patent No. 385,193, dated June 26, 1888.

Application filed February 5, 1887. Serial No. 226,675. (No model.)

To all whom it may concern:

Be it known that I, LEWIS MILLER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Cotton-Presses; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention has relation to improvements in cotton-presses, it having particular reference to that class or character of presses covered by Letters Patent reissued to John F. Taylor, April 2, 1872, and bearing the number 4,851, in which the platen of the press is operated by the introduction into the pressing-cylinders of a liquid under pressure, the pressure being communicated to the said liquid by two steam-cylinders, which act alternately, one serving to impart the initial pressure to the bale, when the least power is required, and the other the finishing or final pressure, the exhaust-steam of the latter being used to operate the former, as will be fully understood by reference to said patent.

In constructing hydraulic presses of the character set forth in Letters Patent No. 367,220, issued to me on the 26th day of July, 1887, of large capacity and great power, I have found that it is impractical, and in cases where the press is desired for very heavy work impossible, to construct the cylinder that is used to impart the initial pressure to the bale of sufficient capacity and strength to contain the amount of liquid required to fill the several pressing-cylinders, and at the same time to keep its dimensions within a limit that will permit of its transportation from place to place without great expense and inconvenience, as is evident. Besides this difficulty, which alone is of such a serious nature as to prohibit the building of large presses under the aforesaid Letters Patent, there is another of equal importance, and it lies in the fact that such a vast amount of steam would be re-

quired to fill the initial-pressure cylinder so constructed as to render it necessary to use a boiler of extremely large capacity, which would of course entail the expenditure of such a large sum, both for maintenance and building, as to further detract from the advisability of such a press.

For the reasons above set forth and others of minor importance, I have devised a system or apparatus for operating hydraulic presses which will embrace the many advantages possessed by the press covered by the patent above mentioned, and which will at the same time obviate or cure the defects found by years of practical experience to exist therein, the principal or most serious of which have been pointed out herein.

To this end my invention consists of the novel arrangement of devices hereinafter fully described, and specifically pointed out in the claim appended.

In order to enable others skilled in the art to which my invention appertains to construct the same, I will now proceed to particularly describe it, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan view of my improved apparatus connected to a hydraulic press. Fig. 2 is a vertical transverse sectional view taken in the plane indicated by the dotted line *x x* on Fig. 1, looking in the direction of the arrows, with the secondary ram removed; Fig. 3, a vertical transverse sectional view through the primary forcing-engine, taken in the plane indicated by the dotted line *x' x'* on Fig. 1, showing its arrangement of valves and a portion of the supply-pipe. Fig. 4 is a vertical longitudinal sectional view of the balance and box-valve placed in the pipe connecting the primary forcing-engine with the press, and lettered *b b'* on the drawings; Fig. 5, an end view of this valve and box; Fig. 6, a vertical longitudinal sectional view of the check-valve which automatically cuts off the primary forcing-engine from the back-pressure of the liquid, and lettered on the drawings *V*; and Fig. 7, a horizontal sectional view of the valve and box shown in Figs. 4 and 5.

Referring to the drawings annexed by let-

ters, A indicates a hydraulic press, preferably of the character covered by my aforesaid Letters Patent. This press being shown in plan view, I have simply represented its head C, endless bands or links D, and the horizontal encircling pipe B, connecting by its branch pipes E with the several cylinders of the press and establishing fluid communication there-with.

Connected to the encircling pipe B, which is in communication with all the cylinders of the press, is a pipe F, which I denominate the "leader," as it is the conduit through which the pressure is communicated to the press from both the primary and secondary forcing-engines. The leader F is properly connected to an elbow, *a*, and this elbow is in turn connected with valve-box *b*, the lower opening in which communicates by means of a pipe, G, with a liquid reservoir or tank, H, supported in any suitable manner—as, for instance, upon a masonry base, H'.

The valve-box *b* is constructed substantially as shown in Figs. 4, 5, and 7—that is, it is enlarged laterally at *a'*, so as to form an enlarged passage-way for the pressing-liquid which will permit of the insertion of a vertically-working balance-valve *b'* without closing or blockading the main passage-way, the said valve being adapted to be operated by hand, and having its seat immediately over the lower opening leading to the supply-tank, so as to cut the latter off from the main passage-way and prevent the pressure from being communicated thereto.

It will be observed by reference to Fig. 4 of the drawings that the diameter of valve *b'* and the outlet in the lower side of the valve-box *b* are practically equal, the object of this being to prevent any downward pressure of the pressing-liquid upon the valve, whereby it is prevented from sticking to its seat and may be readily and easily lifted by the hand, it being by this construction practically balanced.

The secondary forcing-engine or ram T, which is adapted to be operated to finish the compressing of the bale in the press when the greatest power is required, is constructed in the usual manner, and consists of a single large steam-cylinder in which reciprocates a piston, the rod of which works in a suitable cylinder, N, the end of this cylinder being connected to the leader F through the medium of the elbow *a* and a pipe, N', as shown.

The primary forcing-engine J is constructed in this particular instance in a manner similar to the well-known "Worthington" pump; but it may be constructed, as is evident, in any other suitable manner to accomplish the desired purpose. This primary forcing-engine is used to quickly fill the several cylinders of the press and apply the initial pressure to the bale prior to the operation of the secondary ram, which applies the final or greatest pressure. This engine consists, essentially, of the two steam-cylinders K, provided with the

usual piston-rods, *c*, which connect with and operate suitable pumping-pistons in the cylinders P. These cylinders P are provided with valve-boxes *d*, in which work suitable valves well known in pumps, and with these boxes a pipe, R, connects by a number of short branches. This pipe R also connects with a short pipe, R', which in turn connects with a valve box, V, and this box in turn to a pipe, G', leading to and connecting with the valve-box *b*, as clearly shown in Fig. 2.

In the valve-box V is located a check-valve, as clearly shown in Fig. 6, which consists, essentially, of a depending tubular portion, W, perforated at *w*, and a tubular valve, Y, perforated at *y* and surrounding the depending tubular portion W, the said valve being thereby adapted to close automatically when the primary pressure has reached its maximum, so that when the ram is brought into action and the main pipes subjected to the greatest pressure the valves of the primary forcing-engine will be protected from injury from the heavy pressure of the ram.

Between the cylinders P is a pipe, *e*, which connects by suitable branches with a series of valve-boxes, *f*, similar in construction and operation to the above-mentioned valve-boxes *d*, the valve-boxes *f* being in turn connected to the cylinders P, as shown in Fig. 3. The pipe *e* communicates by a pipe, S, with the bottom of the reservoir H.

In operation the pistons of the plungers in the cylinders will draw the liquid from the supply-tank H through the pipe S, pipe *e*, and the valve-boxes *f*, and force it through the valve-boxes *d*, the pipes R and R', the valve-box V, the pipe G', around the balance-valve *b'*, and through the leader F to the press. As soon as the primary engine has exerted its maximum pressure upon the bale in the press the check-valve in the box V will automatically close, thus cutting off the primary engine and all its valves from the back-pressure of the liquid. The secondary ram is now brought into operation and the bale given the final or finishing pressure. The balance-valve *b'* is so arranged that it will prevent the pressure from being communicated to the supply-tank, while at the same time it will permit the liquid to pass around it to the press. When the bale has been duly tied with bands in the usual manner, the balance-valve *b'* is raised and the liquid allowed to run back into the tank, to be used over and over again, when the apparatus is ready for another operation, the piston in the large cylinder of the ram having been receded, as shown in dotted lines in Fig. 1.

It is evident that I might with great advantage utilize the exhaust-steam of the secondary ram to operate the primary engine in a manner similar to that set forth in the aforesaid Taylor patent, thereby economizing greatly in the use of steam.

It will be seen by the foregoing that by my improved apparatus I provide means for

quickly filling the several cylinders of the press and applying the initial pressure to the bale when the least power is required, which is a great desideratum in the operation of all hydraulic presses, and particularly those of large size.

The fact that the exhaust-steam of the ram may be used to run the primary engine (which could not be done were a very large cylinder used) is also a great desideratum, for the reason that it will enable me to economize greatly in the use of steam.

Another important feature of the invention is that I provide a supply-tank (connected to the rest of the apparatus by suitable valved pipes) into which the pressing-liquid may be discharged after an operation and be used over and over again without waste, which is an advantage, as the liquid is usually specially prepared for the purpose.

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

The combination, with the hydraulic press, of the hydraulic ram T, connected directly with the leader-pipe of the said press, the primary forcing-pump J, consisting, essentially, of the engines K K, provided with pistons, which operate in pumping cylinders P, the said cylinders P communicating with the outlet

valve-boxes *d* and the inlet valve-boxes *f*, the outlet-boxes in turn communicating, by means of the pipe R, with the pipe R', and the inlet-boxes with a pipe, *e*, the supply-tank connected to the inlet-pipe of this forcing-pump, the pipe G', connecting the outlet-pipe R' of this pump with the leader-pipe of the press, the automatic check-valve V in the pipe G', adjacent to the outlet-pipe R', and adapted to close automatically when the primary pump reaches its maximum pressure, to protect the valves of the pump from back-pressure, the laterally-enlarged valve-box *b*, inserted in the pipe G', between the leader-pipe of the press and the check-valve V, and provided with an outlet in its under side, the vertically-working balance-valve *b'*, closing the lower outlet in the valve-box *b* and passing through the center of the said enlarged valve-box, so as not to obstruct the passage of the pressing-liquid there through, and the return-pipe G, connecting the outlet in the valve-box *b* with the supply-tank H, all arranged as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

LEWIS MILLER.

Witnesses:

CHAS. D. DAVIS,

W. D. ALEXANDER.