(No Model.) 2 Sheets—Sheet 1.

L. MILLER.

VALVE FOR HYDRAULIC PRESSES.

No. 386,647. Patented July 24, 1888.

Fig. 1.

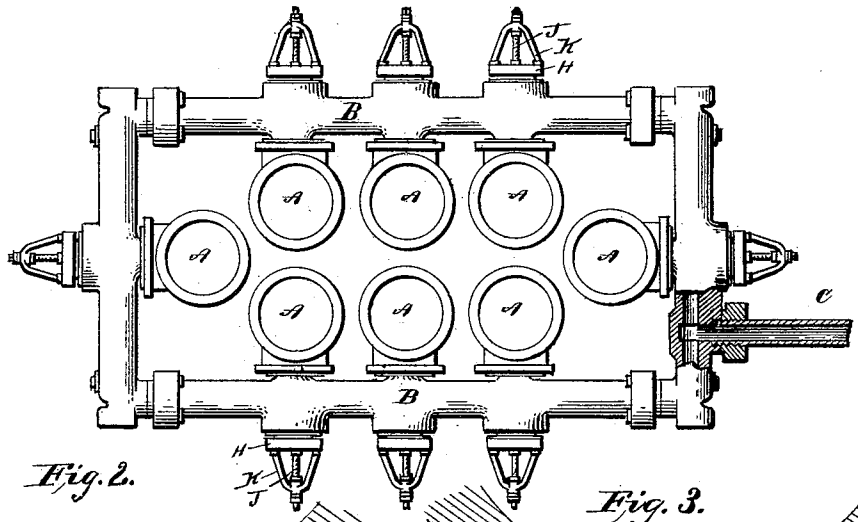


Fig. 2.

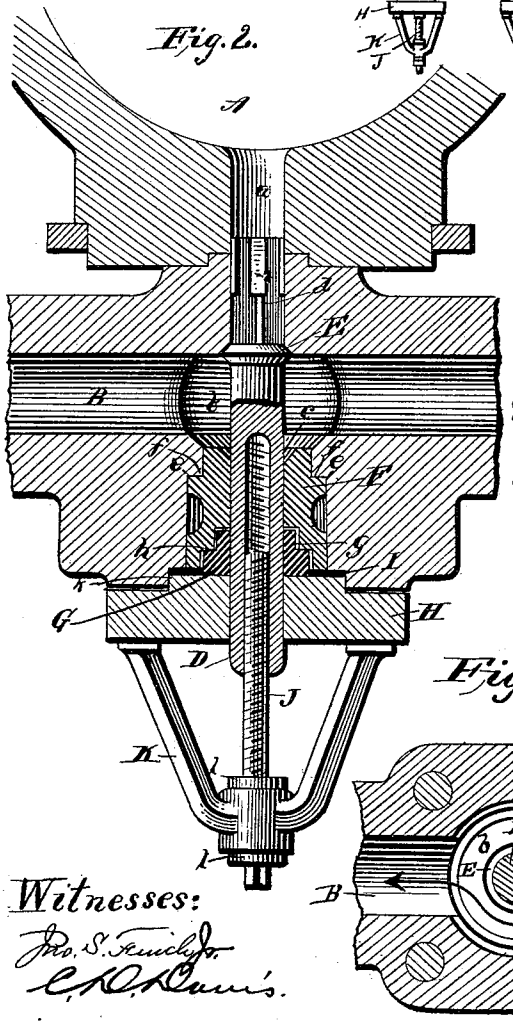


Fig. 3.

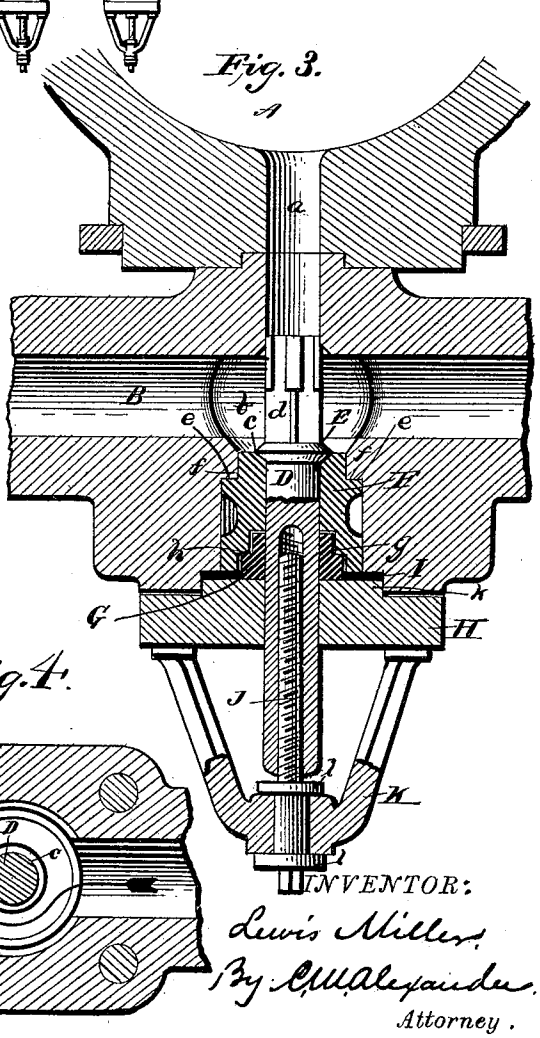


Fig. 4.

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(No Model.) 2 Sheets—Sheet 2.

L. MILLER.

VALVE FOR HYDRAULIC PRESSES.

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Fig. 5.

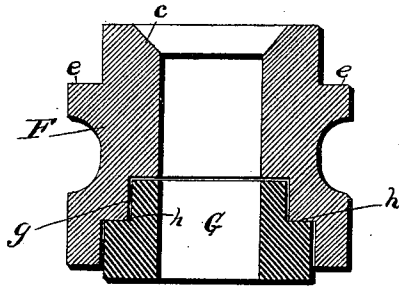
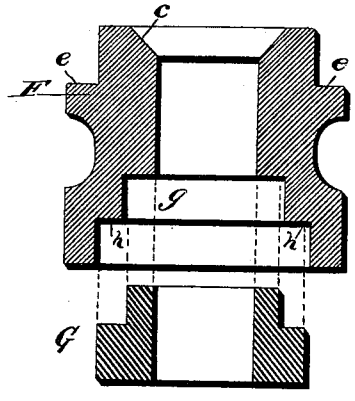


Fig. 6.



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UNITED STATES PATENT OFFICE.

LEWIS MILLER, OF PHILADELPHIA, PENNSYLVANIA.

VALVE FOR HYDRAULIC PRESSES.

SPECIFICATION forming part of Letters Patent No. 386,647, dated July 24, 1888.

Application filed April 12, 1888. Serial No. 270,472. (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 Valves for Hydraulic Presses, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has relation to certain new and useful improvements in hydraulic presses of that type or class described in Patent No. 367,220, issued to me on the 26th day of July, 1887, wherein the lower platen is operated by means of pistons working in vertical pressing-cylinders erected upon a stationary upper platen, the pressing-liquid being conducted to the several pressing-cylinders through a conduit which encircles and is common to all of them.

The especial object of this invention is to provide a hydraulic press employing a number of pressing-cylinders with reciprocating valves adapted to work in the conduit supplying the pressing-liquid, one valve being employed for each cylinder, whereby any one of the pressing-cylinders may be readily shut off from communication with the main conduit whenever desired without stopping the operation of the press, as will more fully hereinafter appear.

In the accompanying drawings, Figure 1 represents a plan view of an eight-cylinder press of the character illustrated in my patent above mentioned, the main conduit and the pressing-cylinders simply being shown; Fig. 2, a horizontal sectional view of a portion of the main conduit and one of the adjacent cylinders, communication therewith being shut off by my improved valve; Fig. 3, a similar view with the valve drawn back to permit the free access of the pressing-liquid to the cylinder; Fig. 4, a detail vertical sectional view of the main conduit, taken through one of the valves therein; Fig. 5, a detail sectional view of the bushing and packing-ring, the latter being inserted in the recess in the bushing; and Fig. 6, a similar view with the ports separated from each other.

Referring to the drawings by letter, A designates the pressing-cylinders, to which are securely bolted the main conduit B for the pressing-liquid, the main conduit in this instance encircling the cylinders and communicating therewith by means of the horizontal independent passages *a*. In the press shown in the annexed drawings eight pressing-cylinders are employed; but it is evident that a greater or less number of cylinders may be used. The pressing-fluid is supplied to the conduit through the pipe C, which communicates with the forcing-pump and ram used for filling the cylinders. To each one of the horizontal passages *a*, which establish communication with the pressing-cylinders, I apply one of my improved horizontally-working valves D, which operates in an enlarged chamber, *b*, formed in the conduit, whereby the pressing-liquid will not be obstructed in its passage through the conduit.

The valve D is provided with a double-beveled head, E, which, when the valve is closed, fits closely upon a beveled seat at the outer terminus of the passage *a*, and when open fits closely against a beveled seat, *c*, formed in the inner end of a bushing, F, through which the stem of valve D works, the stem fitting closely in the central opening in this bushing. The valve D is also provided with a radially-winged spider, *d*, on its inner end, which fits closely in the passage *a*, and thereby guides the valve truly to its seats, while at the same time the pressing-liquid is permitted to flow freely into the cylinder when the valve is open. The valve stem passes closely through the annular bushing F, which fits snugly in a cylindrical opening in a boss formed on the outer side of the conduit. This bushing has formed on it an external annular shoulder, *e*, which sets against an internal shoulder, *f*, projecting into the opening in which the bushing rests. In the outer end of this bushing F is formed a central circular recess or depression, *g*, internally shouldered at *h*, this central depression surrounding the valve-stem, as shown. Into this circular recess *g* is placed an externally-shouldered packing-ring, G, adapted to closely fit the valve-stem. This packing-ring is made a little smaller in diameter than the depression *g* in the bushing, and therefore fits loosely therein, and its external shoulder rests on the internal shoulder, *h*, projecting into the recess, the smaller portion of this annular packing-ring being of such a length as not to reach

quite to the bottom of the depression *g*, for a purpose to be presently stated. It will thus be seen that a small space is left between the outer walls of this annular packing ring and the inner wall of the depression in the bushing, and also that the external shoulder on the packing-ring rests snugly against the internal shoulder in the depression.

The bushing is pressed closely to its seat *f*, and the packing-ring is also held tightly against its seat *h* in the bushing by means of a gland, H, firmly and strongly bolted to the boss on the conduit and pressing directly on the outer end of the packing-ring, and through the medium of a thin packing-ring, I, upon the bushing F also. This gland H is perforated centrally for the passage of the stem of the valve, (which it embraces closely,) and is provided with a circular raised portion, *k*, on its inner face, which raised portion fits in a similarly-shaped recess in the face of the boss on the conduit and presses against the packing-rings I and G, as shown clearly in Figs. 2 and 3. By means of this gland it is evident that the packings and bushing may always be kept tightly and closely to their seats.

The valve is advanced and receded by means of a screw, J, which is journaled in a bracket, K, bolted to the gland H. The stem of the valve is provided with a central longitudinal screw-threaded recess, into which the screw J extends, the screw being kept in perfect alignment with the said recess in the valve by means of the aforesaid bracket K. The screw is squared at its outer end to permit of the use of a key-crank or wrench in operating the valve, and is provided with collars *l l* on each side of the bearing in the bracket to prevent its longitudinal movement. It will be observed that when the screw J is turned in one direction the valve will be advanced to its seat over the passage *a*, and when it is turned in the opposite direction it will be drawn back to its beveled seat *c* in the inner end of the bushing F. When the valve is drawn back or receded, as shown in Fig. 3, the outer beveled face of the double-beveled head E will fit closely against the beveled seat *c* in the bushing, and thereby serve to relieve and protect the packing-rings when the liquid is under pressure in the conduit, the beveled surface of the head fitting the beveled seat so closely and truly as to prevent the liquid from forcing itself in around the stem. The pressure on the inner end of the valve-stem when it is drawn out will serve to assist in keeping the beveled head tightly against its seat in the bushing, as is evident.

When the valve is advanced to its seat over the passage *a*, so as to cut off one of the cylinders from the main conduit, and the liquid is forced in under very heavy pressure, should the liquid force itself in around the stem of the valve and into the small space between the packing-ring G and the bushing, it will serve as a water-packing, and will have a tendency to press the packing-ring against the stem of the valve and the inner face of the gland H, and thereby insure a perfectly-close joint.

Should any one of the cylinders of the press burst or crack, the valve to that cylinder may be closed to cut the cylinder off from communication with the main conduit and the press operated as before.

In the presses now in use no means are provided for regulating the pressure under which the press shall run; or, in other words, when a press is built of a certain capacity it must always be run under that capacity or not at all. Now, therefore, it is the principal object of this invention to provide a press that may be readily adapted to either light or heavy pressing, as the exigencies of the case may require. Thus should it be desired to adapt the press to light and quick pressing any number of the cylinders may be cut off from the main conduit, according to the degree of pressure desired. The advantages to be derived from this provision are very important, as very frequently in pressing cotton for shipment a shipper does not desire the cotton pressed very heavily, but only wishes the bales reduced to a certain degree of density. With the presses now in use this cannot be done; but by providing the press with my invention the desired pressure upon the bales may be obtained. It is also obvious that when one or more of the cylinders are shut off the press may be operated more rapidly and with a proportionately smaller quantity of pressing-liquid and steam, thus effecting a great saving and rendering it possible to do the pressing at a smaller cost to the shipper. It will also be perceived that a saving will be effected in the consumption of fuel, as the fireman may charge the furnace with just the necessary amount of fuel and no more. As all the cylinders may be capable of exerting a certain determined pressure, it is evident that the capacity of the press may be readily regulated or reduced to the desired degree.

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

1. The combination of the vertical cylinders A, the conduit B, surrounding the cylinders and communicating therewith by means of horizontal independent passages *a*, the horizontal valves D, working in enlarged chambers *b* in the said conduit and adapted to close the said independent passages *a*, these valves being provided with radially-winged spiders *d*, which serve to guide them to their seats, a removable bushing inserted in a recess in the conduit, a packing-ring inserted in the bushing, and a gland bolted to the conduit, substantially as described.

2. The combination of a conduit provided with a lateral passage, *a*, this conduit being provided with an internally-shouldered recess opposite the said passage *a*, an internally and externally shouldered bushing, F, inserted in

the shouldered recess in the conduit, this bushing being provided with a bevel-seat, *c*, in its inner end, a shouldered packing-ring, G, inserted in the bushing F, a valve, D, passing through the packing and bushing and working in an enlarged chamber, *b*, in the conduit, this valve being provided with a double-beveled head, E, adapted to alternately seat itself over the passage *a* and against the bevel-seat *c* in the bushing, a packing, I, and a gland, H, bolted to the conduit and adapted to press directly against the said packing I and packing-ring G, and means for operating the valve D, substantially as herein described.

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

LEWIS MILLER.

Witnesses:

C. D. DAVIS,

JOHN S. FINCH, Jr.