

No. 697,287.

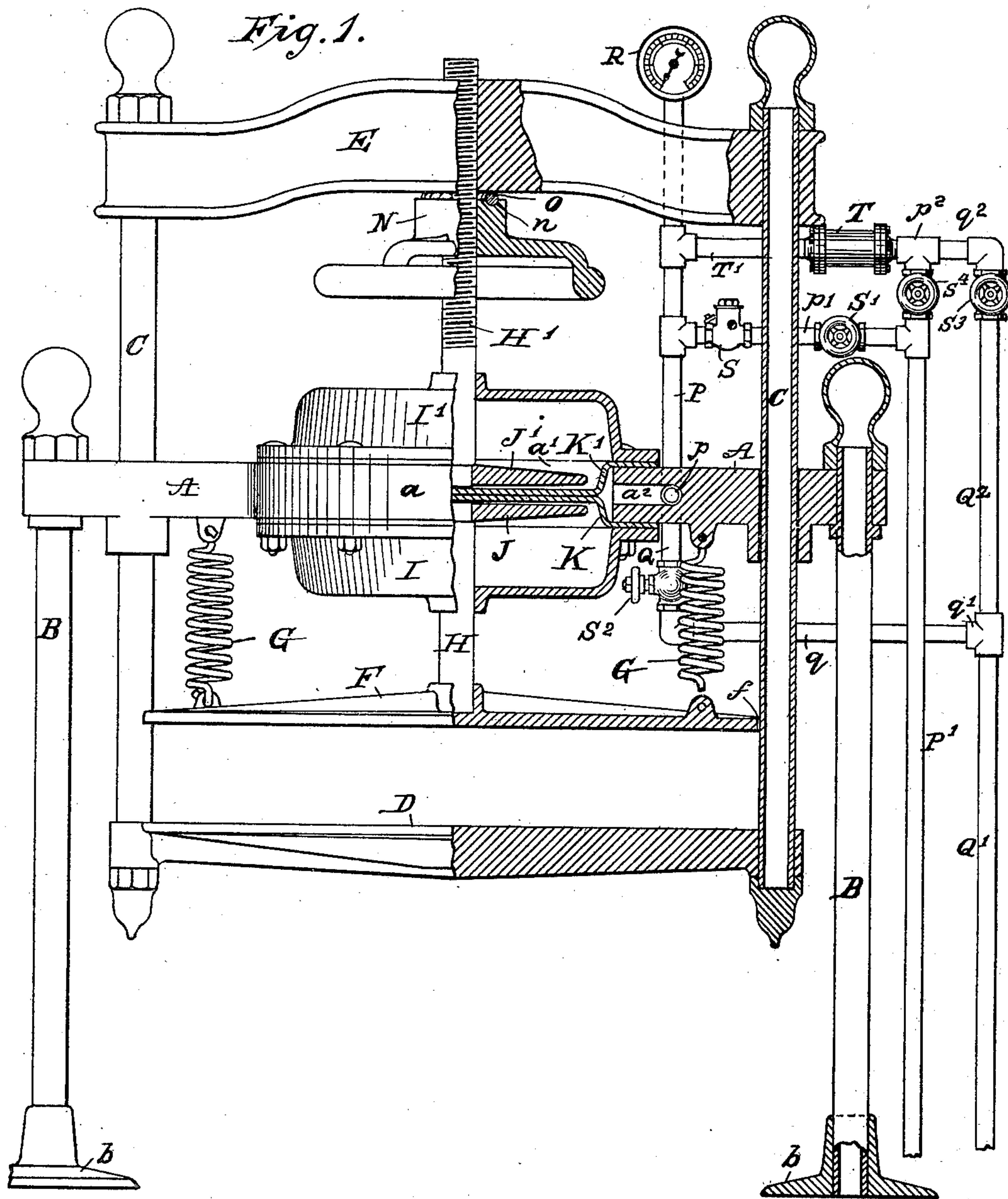
Patented Apr. 8, 1902.

W. L. SPAULDING.
PRESS.

(Application filed Oct. 8, 1900. Renewed Sept. 5, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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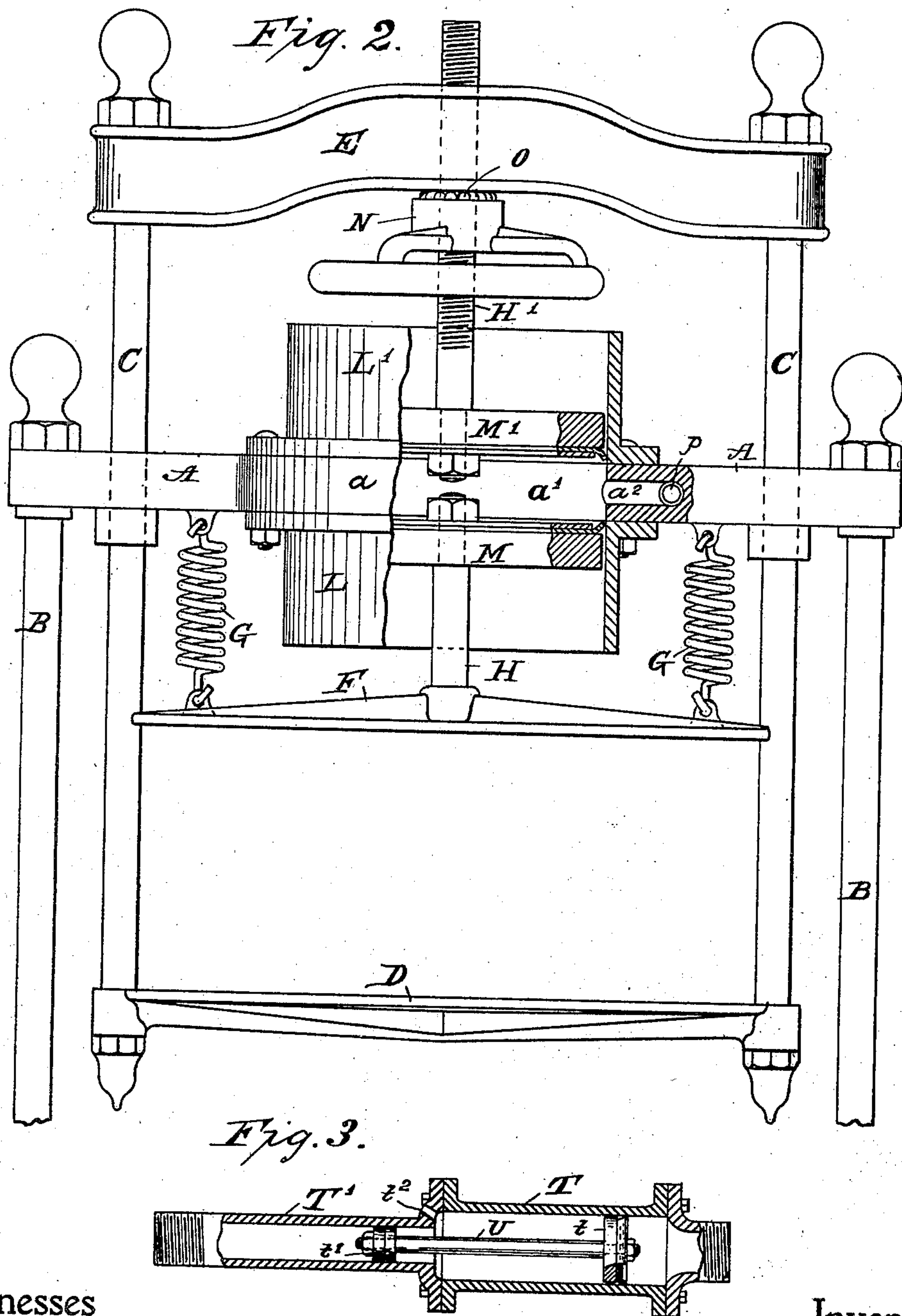
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UNITED STATES PATENT OFFICE.

WESLEY LINCOLN SPAULDING, OF MANCHESTER, NEW HAMPSHIRE.

PRESS.

SPECIFICATION forming part of Letters Patent No. 697,287, dated April 8, 1902.

Application filed October 8, 1900. Renewed September 5, 1901. Serial No. 74,390. (No model.)

To all whom it may concern:

Be it known that I, WESLEY LINCOLN SPAULDING, a citizen of the United States, residing at Manchester, in the county of Hillsboro and State of New Hampshire, have invented certain new and useful Improvements in Presses; and I do hereby 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.

Heretofore it has been impossible to maintain a given or uniform pressure upon certain work—such as books, leather goods, belting, cloth, or veneering—by means of a hand-press which is actuated by either screws or cams, for two reasons. The power thus applied will vary when the screw or cam is operated by different individuals. Then, again, such materials as above mentioned after remaining under pressure a few moments will have become so much contracted as to render it an easy matter to further adjust the screw or cam in a manner to increase the pressure. This is especially true in relation to goods which are glued or cemented together and require to be pressed, as the surplus glue or cement will ooze more or less from between the sheets, and unless the pressure is increased as the materials under pressure may contract much of the vitality of the adhesive materials is lost by reason of the diminution of the pressure before the adhesives have become firmly set. By the use of my improved press these conditions are impossible, as a continuous pressure is provided following that which at first seems to be the limit.

The object of the invention is to provide a pneumatic or hydraulic press having a movable bed and pressure-plate, both being actuated by pistons or diaphragms capable of adjustment before applying pressure to materials of varying thickness and capable of hand manipulation and having an auxiliary pneumatic or hydraulic supply capable of increasing the pressure from pounds to tons.

The invention consists in the novel construction and adaptation of parts whereby a press is rendered double-acting, capable of ready adjustment to work of varying thickness, and adapted to be operated by hand-

screws or hydraulic power independent one of the other, as will be fully set forth in the following specification and claims and clearly illustrated in the drawings accompanying and forming a part of the same, of which—

Figure 1 is a broken elevation showing one of my improved double-acting presses. Fig. 2 is a similar view showing modifications of my invention. Fig. 3 is a broken elevation showing in detail the auxiliary connection whereby the applied pressure may be increased.

Similar reference-letters denote corresponding parts in all the views.

A represents the bed-plate, which is provided centrally with a circular portion a , having a large central opening a' , as shown, and supported upon suitable standards B, and the plate A is also perforated at a^2 at opposite sides of the part a for the reception of the bars C, which form a portion of a vertically-sliding frame, said bars being attached at their lower ends to a movable bed D and at their upper ends to the yoke E of the improved press.

The pressure-plate F is provided with a notch f at each end for the reception of the bars C, which serve as guides for said pressure-plate, which plate is supported by helical springs G, connecting said plate with the under side of the stationary plate A, as shown.

By the peculiar construction and arrangement of the various parts comprising my improved press when in operation the plate D is caused to move up and the pressure-plate F to move down or toward the plate D, and this may be accomplished by means of piston-rods H H', the former being connected to the said plate F and the latter to the yoke E, the adjacent ends of said piston-rods H H' passing, respectively, through the caps I I', secured to opposite sides of the circular portion a of the stationary bed-plate A and provided with moderately-thin disks, respectively J J', between which rest a pair of flexible diaphragms K K', firmly attached to the opposite sides of said part a , as seen in Fig. 1; or should it be desired to increase the adjusting capacity of the press caps L L', of increased length, may be substituted for the caps I I', said caps being bored perfectly true, and pis-

tons MM' , closely fitting the bore of said caps, may be attached, respectively, to the piston-rods HH' in substitution of the disks JJ' , as shown in Fig. 2. In either construction a suitable hand-nut N will be threaded to the piston-rod H' and adapted to bear against the under side of the yoke E for adjusting the space between the plates D and F , and the contact-surface of this nut N may be grooved, as at n , for the reception of balls O , as shown in Fig. 1, if desired.

a^2 represents a right-angled water or air passage leading from one side of the part a into its opening a' and thence to the caps II' or cylinders LL' , and into this passage a^2 is threaded a pipe p , which connects with the supply P and drain-pipe q . The supply-pipe P extends upward and may be provided with a pressure-gage R , as seen in Fig. 1, for the purpose of determining the pressure to which any particular work is subjected, and between the pressure-gage and the pipe p is connected a short pipe p' , which is provided with a check-valve S and the main supply-valve S' , which latter controls the supply of water or air from the main supply-pipe P' . The drain-pipe Q is provided with a valve S^2 , as shown, and below this valve the drainage passes through a short pipe q to the main drain-pipe Q' .

The pipes and valves just mentioned are sufficient to operate the press when only ordinary pressure is required; but in case an increased and continuous pressure is desired I may connect the pipe q to the pipe Q' by a T-coupling q' and attach the pipe Q^2 , provided with a valve S^3 , to said coupling q' and to a short pipe q^2 , connecting with a T-coupling p^2 , to which is attached one end of the auxiliary pressure-cylinder T , and with the auxiliary supply-valve S^4 , which controls the supply of water or air from the main supply-pipe P , the opposite end of the auxiliary pressure-cylinder T' being connected to the supply-pipe P at a point above the pipe p' , as shown.

The standards B rest upon base-plates b , which may be bolted to the floor, and said standards support the entire weight of the press.

The auxiliary pressure device comprises a pair of cylinders $T T'$, connected in alignment, and the latter being smaller than the former, and each containing pistons, respectively $t t'$, connected by a piston-rod U , upon the ends of which either piston is mounted, as shown in Fig. 3.

To operate my improved double-acting press, the books or other work to be pressed is placed upon the bed-plate D and the valve S' opened, thus admitting the pneumatic or hydraulic force from the main supply-pipe P' to the pipe P , the passage a^2 , and thence between the diaphragms KK' (seen in Fig. 1) or the pistons MM' , (seen in Fig. 2,) thus forcing the plates $D F$ toward each other, the pressure indicated by the gage R showing

the power developed per square inch of area in either the diaphragms or pistons. If more power is required, or a following pressure for such work as bookbinding or other glued work, (which becomes necessary for the reason that glue in drying shrinks to a certain extent,) the valve S^4 is also opened, admitting pneumatic or hydraulic force to the larger cylinder T , causing the piston t to force the piston t' against the pneumatic or hydraulic force already expended against the diaphragms KK' or pistons MM' with greatly-increased power, the check-valve S preventing all escape. The area of the cylinder T' being smaller than that of the cylinder T , any desired pressure may be attained in addition to that available from the direct head or supply. To release the pressure against the plates $D F$, the valves $S^2 S^3$ are opened, thus permitting the escape of the pneumatic or hydraulic force, and to insure and facilitate the easy movement of the pistons $T T'$ one or more perforations are provided in the enlarged or flanged portion of the part T , as shown at t^2 in Fig. 3, at which point said perforation t^2 will be out of the way of the pistons.

My improved construction possesses advantages over the construction shown and claimed in my United States patent numbered 633,665 and dated the 26th day of September, 1899, for the reason, first, that it will accommodate itself to and take in work as thick as it would be practical to operate upon; second, that a continuous pressure is maintained with pneumatic or hydraulic force so long as the valve supplying the force is left open, and, third, that not only is the necessary adjustment of the pressure and bed plates accomplished by a threaded screw and hand-nut fitted thereto, but the threaded screw and hand-nut are so arranged as to convert the press at any moment into a simple hand-press, the single screw H' and hand-nut N causing the simultaneous movement of both plates $D F$, thus permitting its use both as a hand or power press, as occasion may require, the one power being independent of the other.

Having described my improvements, what I claim is—

1. In a power-press, a stationary frame, a vertically-movable frame mounted in said stationary frame and supporting a bed-plate, the said bed-plate, a spring-supported pressure-plate, and means for forcing said plates toward each other, said means comprising a diaphragm or piston for each plate mounted within oppositely-disposed caps or cylinders and pneumatic or hydraulic force introduced between said diaphragms or pistons.

2. In a power-press, a stationary frame, a vertically-movable frame mounted in said stationary frame and supporting a bed-plate, the said bed-plate, a threaded shaft and hand-nut fitted thereon for adjusting the frame carrying said bed-plate, a spring-supported pressure-plate, a cylindrical chamber carrying diaphragms or pistons one of which connects

with the movable frame carrying the bed-plate and the other with the pressure-plate, and means for introducing pneumatic or hydraulic force centrally within said chamber for forcing said diaphragms or pistons apart.

3. In a power-press, a spring-supported pressure-plate, a vertically-movable frame carrying a bed-plate, a threaded shaft and hand-nut attached and adapted to adjust said movable frame, a cylindrical chamber provided with an opening for the introduction of pneumatic or hydraulic force, and diaphragms or pistons located within said chamber one piston being connected with said movable frame and the other with said pressure-plate whereby said pistons are forced apart and said plates forced toward each other by pneumatic or hydraulic force.

4. In a power-press, a frame comprising vertical standards supporting a cross-bar, a pressure-plate and suitable springs connecting the same with said cross-bar, a vertically-movable frame mounted in said cross-bar, a bed-plate attached to said movable frame, caps or cylindrical projections secured to opposite sides of said cross-bar, a piston in each cap or cylindrical projection the upper piston being attached to a shaft which is adjustably connected to the movable frame and the lower piston being connected by a shaft with said pressure-plate, and means for introducing pneumatic or hydraulic force simultaneously to said pistons, substantially for the purpose set forth.

5. In a power-press, diaphragms or pistons adapted to operate the pressure-plates for clamping the work, the said pressure-plates, a pair of connected cylinders of unequal diameter and located in the pressure-supply pipe, a piston fitted to each cylinder, a single piston-rod upon which said pistons are mounted, and a supply-opening in the larger cylinder for the admission of pneumatic or hydraulic force, whereby the work in the press may be clamped and a continuous or following pressure maintained so long as the valve controlling the supply is left open.

6. In a press, a frame comprising vertical standards supporting a cross-bar, the said cross-bar, a pressure-plate and suitable springs connecting the same with said cross-bar, a vertically-movable frame mounted in said cross-bar, a bed-plate attached to said movable frame, and a threaded shaft and hand-nut fitted thereto whereby said plates may be forced toward each other, substantially for the purpose set forth.

7. In a fluid-operated press, two pressure-plates, a piston or diaphragm operatively joined with each of the said plates, means for causing fluid to enter between and act upon said pistons or diaphragms to move one away from the other to thereby force said plates one toward the other.

8. In a fluid-operated press, two pressure-plates, a piston or diaphragm operatively joined with each of the said plates, means for causing fluid to enter between and act upon said pistons or diaphragms to move one away from the other to thereby force said plates one toward the other, and auxiliary means for increasing or multiplying the pressure.

9. In a fluid-operated press, a plurality of pressure-plates, a piston or diaphragm in operative connection with each of said plates and located at one side of the horizontal plane occupied by said plates, and means for introducing fluid between said pistons or diaphragms for separating them and forcing said plates toward each other.

10. In a fluid-operated press, a cylinder, a plurality of opposed pistons or diaphragms therein, means to supply fluid to said cylinders between said pistons or diaphragms and pressure-plates operatively connected with said pistons or diaphragms and actuated thereby.

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

WESLEY LINCOLN SPAULDING.

Witnesses:

J. B. THURSTON,

J. EDWIN HARTSHORN.