

(No Model.)

2 Sheets—Sheet 1.

W. E. PAGE & L. J. BUCHANAN.
PNEUMATIC LETTER PRESS.

No. 474,401.

Patented May 10, 1892.

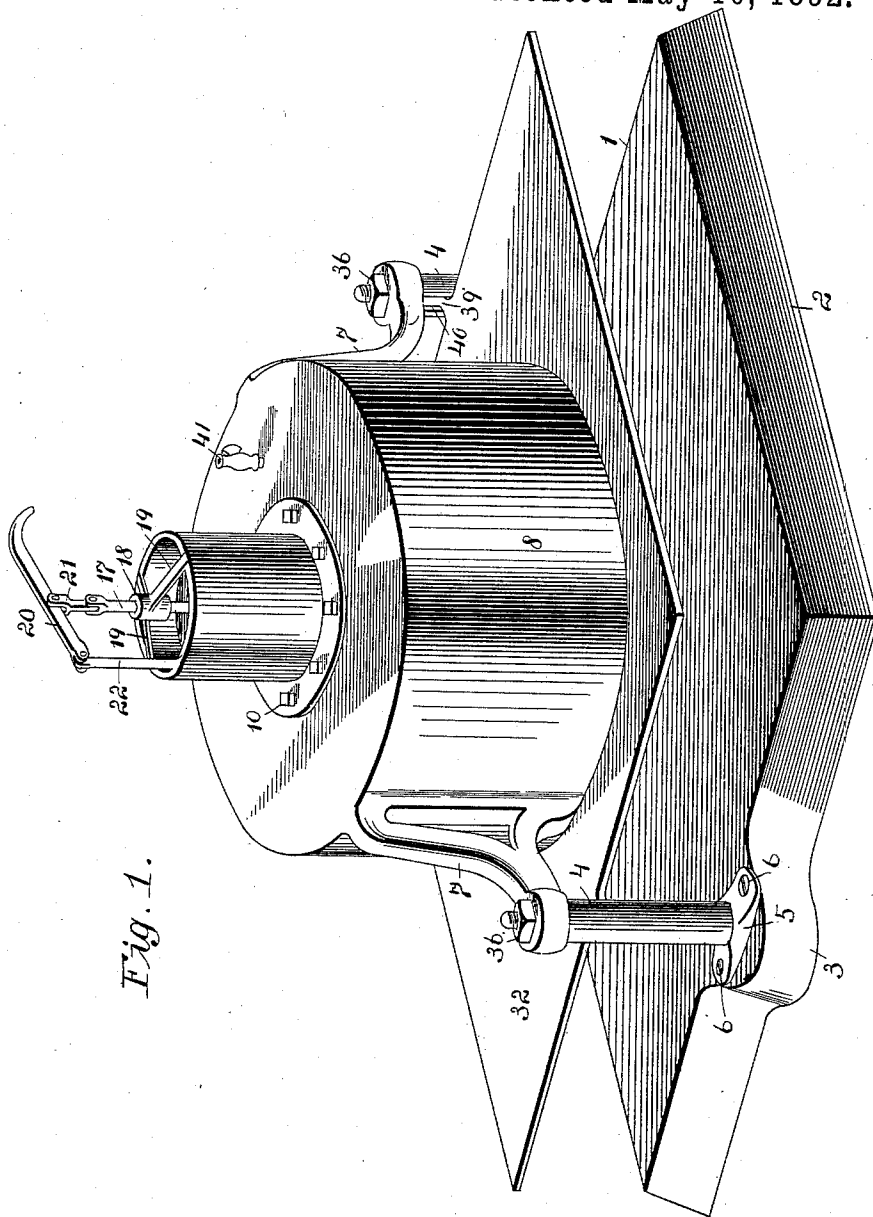


Fig. 1.

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2 Sheets—Sheet 2.

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Fig. 3.

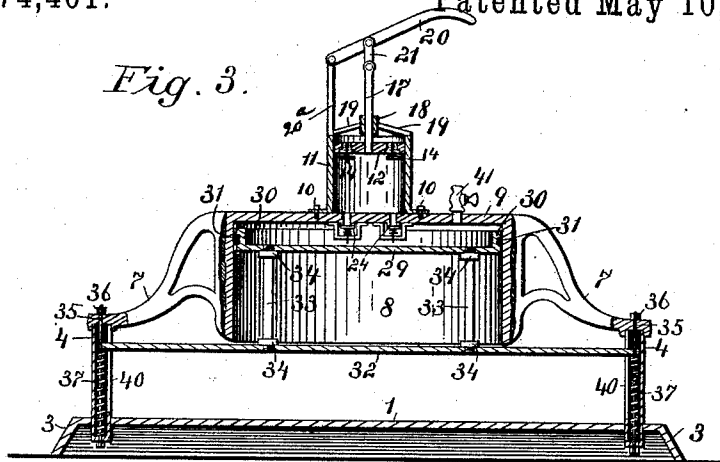


Fig. 2.

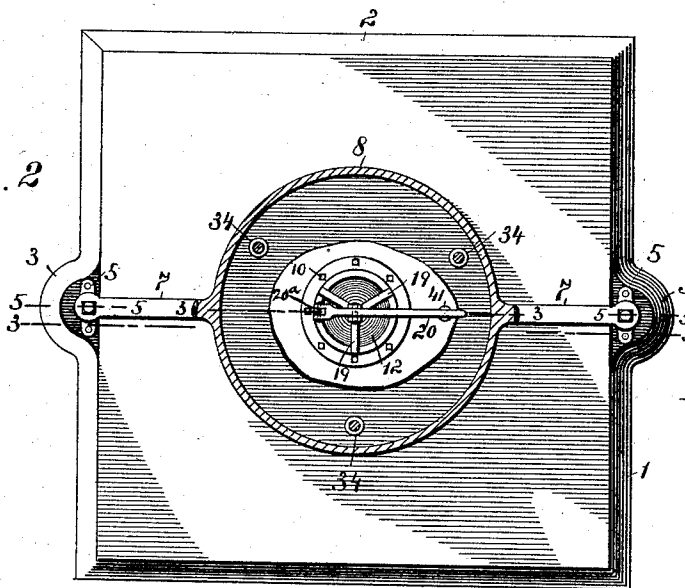


Fig. 7.

Fig. 4.

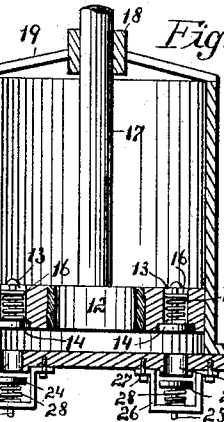


Fig. 5.

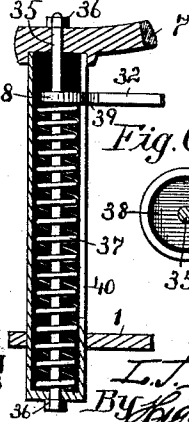
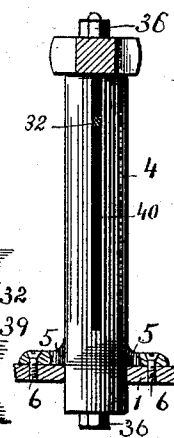


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM E. PAGE AND LAWRENCE J. BUCHANAN, OF KANSAS CITY,
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PNEUMATIC LETTER-PRESS.

SPECIFICATION forming part of Letters Patent No. 474,401, dated May 10, 1892.

Application filed July 30, 1891. Serial No. 401,127. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM E. PAGE and LAWRENCE J. BUCHANAN, of Kansas City, Jackson county, Missouri, have invented certain new and useful Improvements in Pneumatic Letter-Presses, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

Our invention relates to presses to be used in taking copies of written or printed documents and for analogous purposes; and the objects of our invention are to produce a simple, durable, and inexpensive letter-press in which the power for imparting the required pressure to the book or other articles shall be imparted by compressed air, thus greatly reducing the amount of labor required to produce copies and for other similar purposes.

To the above purposes our invention consists in certain peculiar and novel features of construction and arrangement, as hereinafter described and claimed.

In order that our invention may be fully understood, we will proceed to describe it, with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a pneumatic letter-press constructed in accordance with our invention. Fig. 2 is a view of the same partly in plan and partly in horizontal section. Fig. 3 is an irregular transverse vertical section of the same on the line 3 3 of Fig. 2. Fig. 4 is a central transverse vertical section of the compression chamber or cylinder, on an enlarged scale. Fig. 5 is a transverse vertical section of one of the hollow guide-supports on the line 5 5 of Fig. 5. Fig. 6 is a plan view of one of said supporting-guides with its cross-bar removed. Fig. 7 is an inner side elevation of one of said guide-supports.

In the said drawings, 1 designates the base of our improved letter-press, said base being either of rectangular form, as shown, or of any other suitable or preferred form, and being also preferably a metal casting having downwardly-extending marginal flanges 2, so that the body portion of the base shall be elevated somewhat above the table, bench, stand, or other object upon which the press may be

placed. At two of the opposite margins of this base 1 are formed a pair of offsets 3, upon each of which is secured a hollow or tubular vertical guide support or standard 4, the lower end of which extends preferably somewhat below the body portion of the base 1 and which is retained in position by a foot 5, said foot being screwed or bolted or otherwise similarly secured upon the upper side of the base 1, as shown at 6. Upon the upper end of each of these two guide supports or standards 4 rests the outer end of a cross-bar or bracket 7, these two cross-bars or brackets being formed upon or secured to the outer surface or side of a hollow casting 8, to be presently more fully described. Upon the upper side of the top 9 of this casting 8 is bolted, as at 10, or otherwise firmly secured a vertical cylinder or compression-chamber 11. Within this compression-chamber or cylinder 11 works a piston-head 12, which is provided with one or more ports 13, in each of which works a downwardly-opening valve 14, said valve being held normally in open position by a coiled spring 15, surrounding the stem of the abutting-valve and abutting at its upper end against a cross-bar 16 in the opening. The piston-rod 17 of the piston-head 12 works through a hub 18, which is supported by a suitable number of radial arms 19 at the open upper end of the said compression-chamber. To the upper end of this piston-rod is pivotally connected the lower end of a link 21, the upper end of which is forked as shown, and within the forked upper end of this link is pivoted a lever 20, one end of which is pivotally secured at the upper end of a suitable standard 20^a, which extends vertically upward from the compression-chamber or cylinder 11. Through the upper part 9 of the casting 8 are formed one or more ports 23, beneath each of which is placed a downwardly-opening valve 24. The stem 25 of each of these valves works through a bracket 26, which is bolted or otherwise suitably secured to the under side of the top 9, as shown at 27, and the stem of each valve is surrounded by a coiled spring 28, which acts against the bracket 26 to normally retain the valve 24 in its closed position. Within the casting 8 is located a movable diaphragm 29, which is of such area as to fit closely within

said casting, and the margin of which is formed with a flange 30, in which is set a packing-ring 31.

32 designates the platen of the press, and 5 this platen is connected to the diaphragm 29 by three or any other suitable number of rods 33, the upper and lower ends of which are preferably right and left screw-threaded and enter similarly-threaded openings in the diaphragm and platen. Washers 34 are secured 10 upon the upper and lower parts of these rods, and thus the diaphragm and platen are strongly connected together. Through each of the vertical guide-supports or standards 4 15 extends a vertical rod or bolt 35, which also extends through the outer end of the corresponding cross bar or bracket 7 and through the lower end of the support or standard 4. Nuts or heads 36 upon the ends of these rods 20 35 serve to secure the cross bars or brackets in strong connection with the supports or standards 4, and each of said rods 35 is surrounded within the support 4 by a coiled spring 37, the lower end of which rests upon 25 the lower end of the said support. The platen 32 is formed at two of its opposite sides with two offsets or projections 38, which correspond in form with the transverse internal area of the corresponding support or standard 4, and the neck 39 of which extends 30 through a vertical slot in the inner side of said support or standard. These offsets loosely surround the rods 35 and rest upon the upper end of the springs 37. A suitable 35 valve 41 is tapped into the top 9 of the casting 8.

The operation of the above-described mechanism is as follows: The book or press-copying paper or other article is placed upon the 40 base 1, the platen 32 being at the uppermost limit of its movement. The handle 20 is now moved rapidly upward and downward, causing corresponding movements of the piston 12. At each upward movement of the piston 45 12 the valves 14 are moved downward against the action of the springs 16, the action of said springs being to retain the valves in closed position, the valves 24 being simultaneously closed by their springs 26. During this upward 50 movement of the piston 12 a quantity of air is allowed to flow through the port or ports 15 and enters beneath the piston. As soon as the piston begins to descend the valves 14 are closed by their springs 16 and the 55 pressure of air opens the valves 24, allowing the air to flow through the ports 23 in the top 9 of the casting 8 and to depress the diaphragm 29. Repeated operations of the lever 20 thus cause the diaphragm 29 and platen 60 32 to descend until the platen presses powerfully upon the article resting upon the base 1, the descent of the platen also causing the offsets 38 of the platen to compress the springs 37. Meantime the valve 41 has been kept 65 closed, and as soon as the pressure has been completed this valve is opened, allowing the compressed air to escape from above the dia-

phragm and permitting the springs 38 to raise the platen and diaphragm in readiness for another descent.

70 From this description it will be seen that we have devised a very simple, durable, and inexpensive pneumatic letter-press which is capable of exerting a powerful pressure and which requires but little manual labor for its 75 effective operation. It will be further seen that, owing to the described relative position of the several parts of the press, the lever for operating the piston is so located as to be 80 readily grasped and manipulated by the operator, enabling him to exert direct downward pressure upon the lever, and thus materially lessening the labor involved in operating the lever. Furthermore, that said relative 85 arrangement of parts is such that the effective action of the moving parts is downward, the weight of said parts thus aiding the effective pressure of air. Finally, it will be seen that, by virtue of the relative position of the parts 90 of the press, the latter is as a whole without cumbersomeness or complication of construction.

Having thus described our invention, what we claim as new therein, and desire to secure 95 by Letters Patent, is—

An improved pneumatic letter-press comprising a base or bed, a pair of vertical tubular standards rising from said base, an inclosing casing located above the base, a pair of supporting brackets extending oppositely 100 from the casing and resting upon the upper ends of the tubular standards, a vertically-movable platen interposed between the inclosing casing and the base and having a pair of oppositely-disposed projections working 105 through longitudinal slots in the vertical tubular standards, a pair of lifting-springs interposed between the under sides of the platen-extension and the lower ends of the standards, and also located within said standards, a rigid 110 diaphragm located above the platen and connected rigidly thereto by a pair of vertical rods and also inclosed and vertically movable within the casing, a compression-chamber located above the casing and having a 115 vertical standard, an operating-lever pivotally connected to the upper end of the standard, a piston working vertically within the compression-chamber and provided with one or more ports, spring-pressed valves, each operating 120 to close one of said ports, one or more ports in the top of the inclosing casing and establishing communication between said casing and the compression-chamber, and a number of spring-pressed valves, each operating 125 to close one of the last-named ports, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

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