(No Model.) 4 Sheets—Sheet 1.

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Fig. VI.

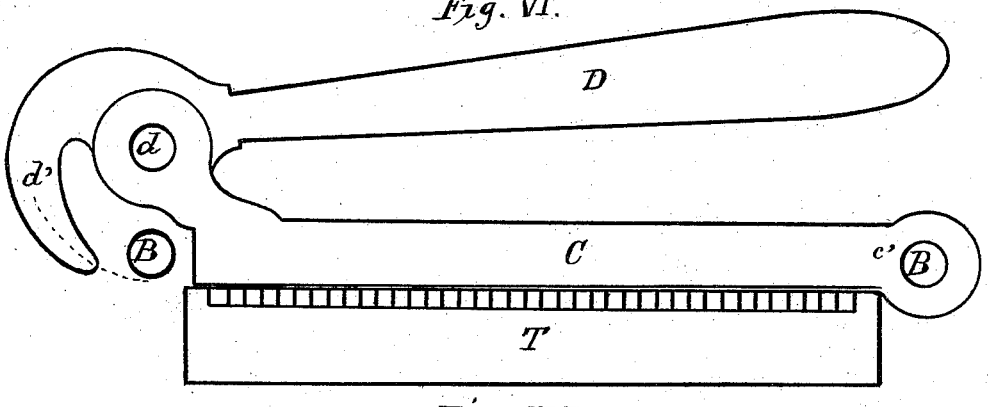


Fig. VII.

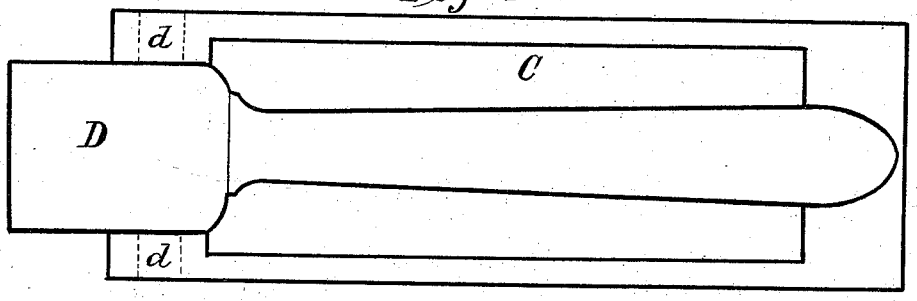
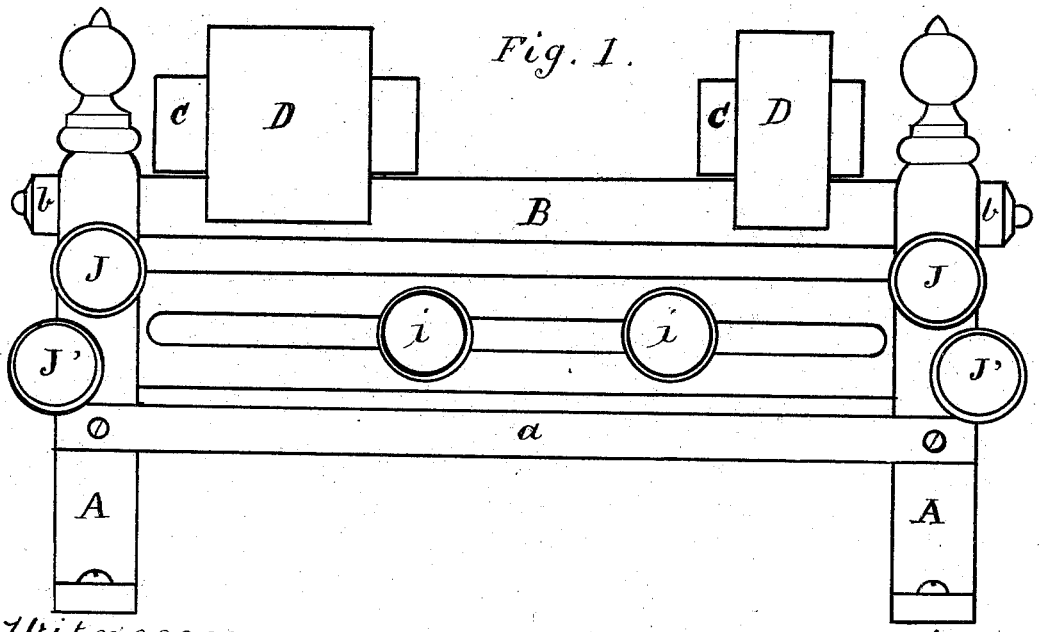


Fig. 1.



Witnesses
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(No Model.) 4 Sheets—Sheet 2.

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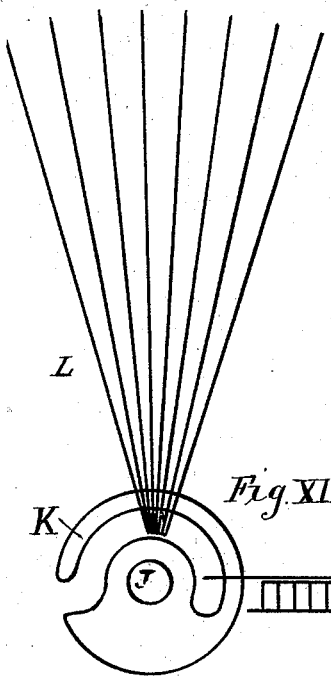


Fig. XII.

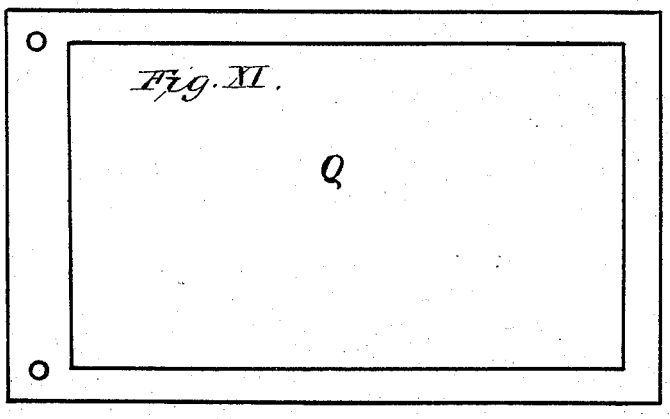
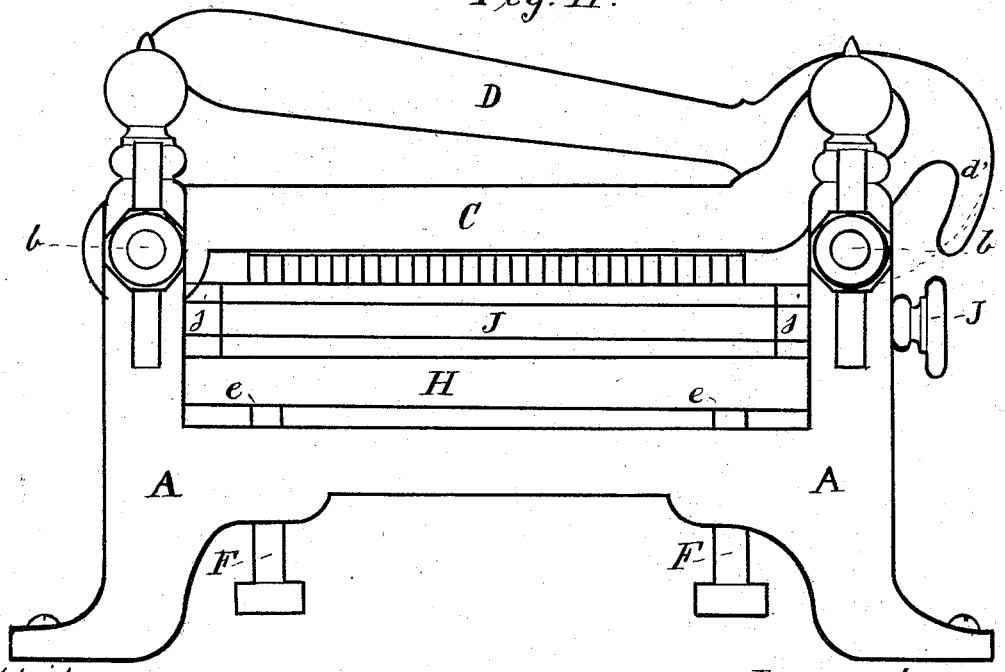


Fig. XI.

Fig. II.



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(No Model.) 4 Sheets—Sheet 3.

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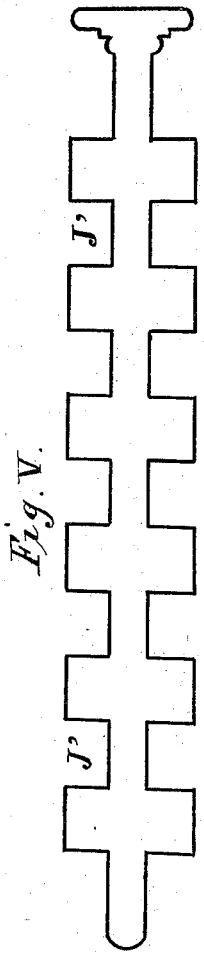

Fig. V.

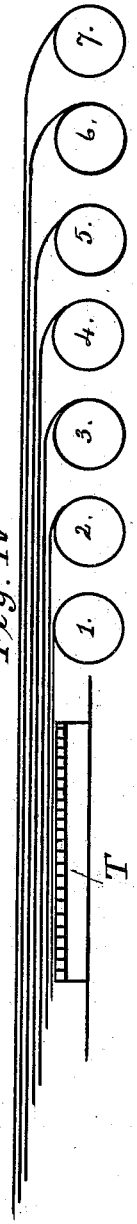

Fig. IV.

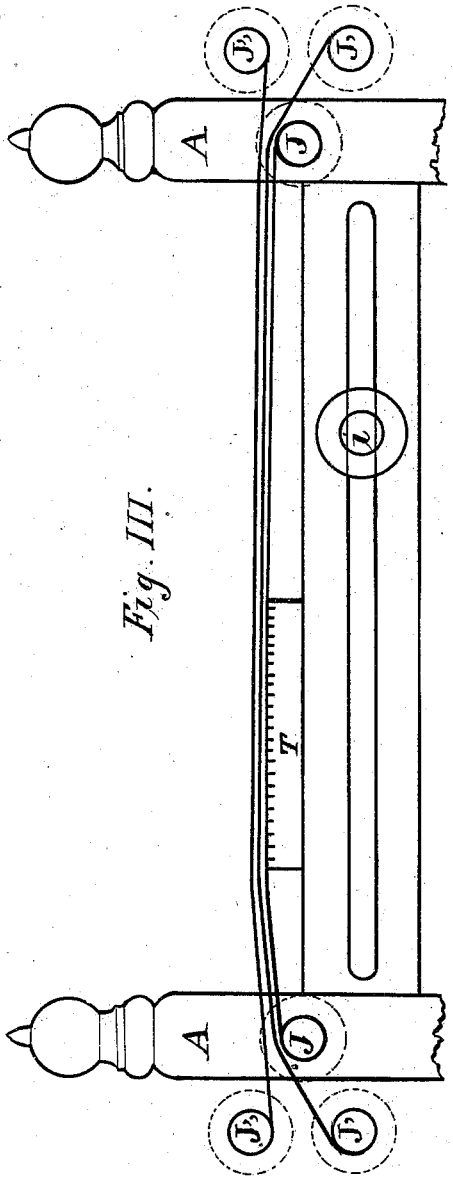

Fig. III.

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(No Model.) 4 Sheets—Sheet 4.

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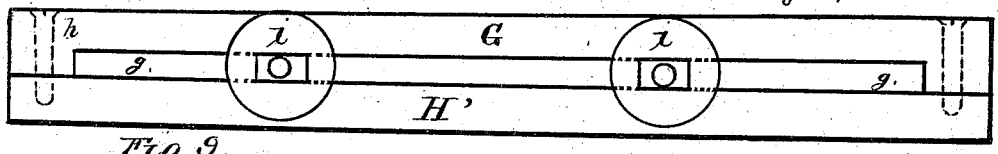


Fig. 9.

Fig. VIII.

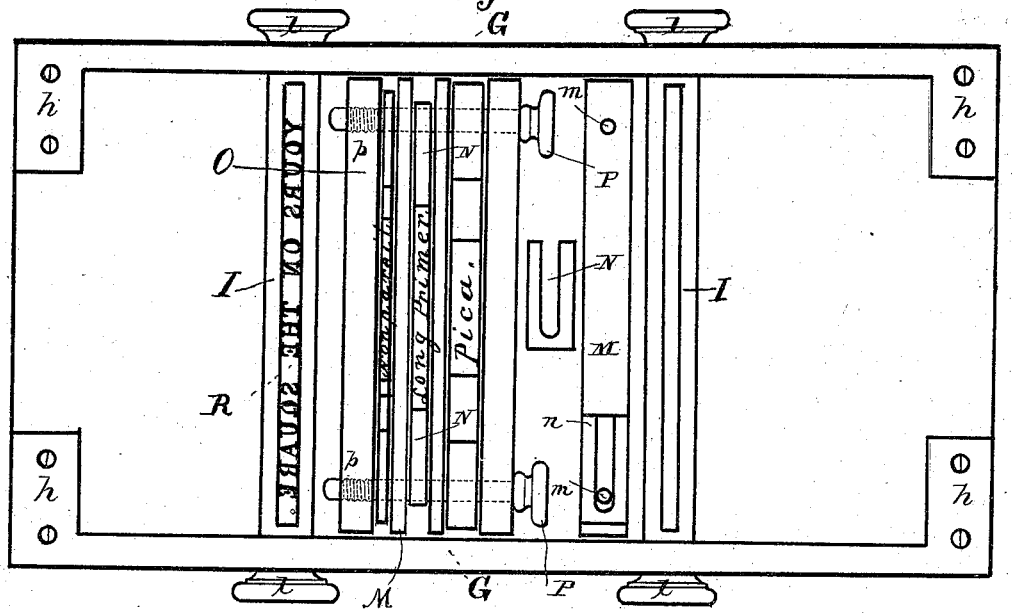
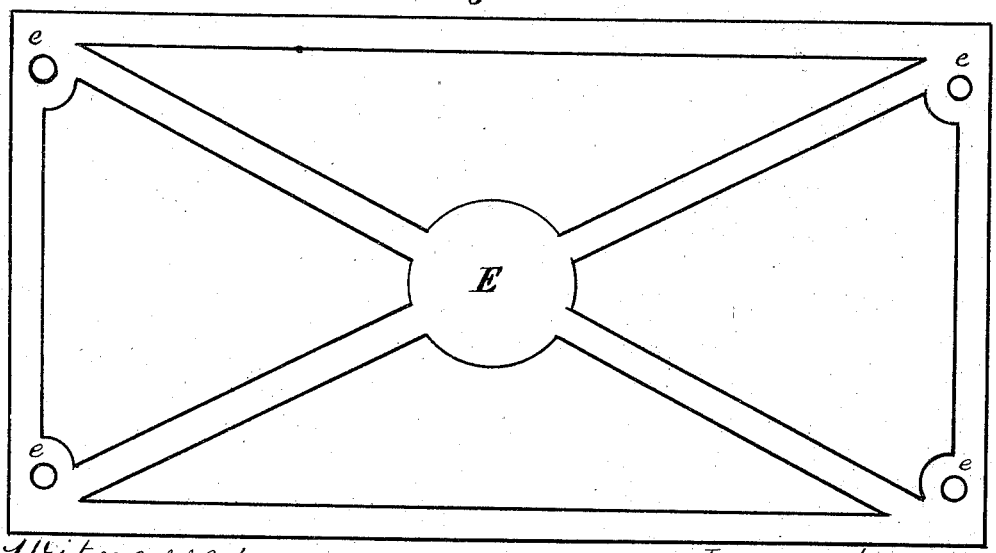


Fig. X.



Witnesses.
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UNITED STATES PATENT OFFICE.

THOMAS D. WORRALL, OF LYNN, MASSACHUSETTS.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 382,345, dated May 8, 1888.

Application filed January 20, 1887. Serial No. 224,968. (No model.)

To all whom it may concern:

Be it known that I, THOMAS D. WORRALL, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Printing-Presses for Printing in One or More Colors, for which I desire to obtain Letters Patent, of which the following is a specification.

My invention relates to improvements in presses for printing in one or more colors, and for printing several sheets of paper from one and the same form, and for devices for holding type in the bed of the said press, as hereinafter described and claimed.

To enable others skilled in the art to construct and use my invention it is herein described as follows.

Fig. I is a front view of my printing-press. Fig. II is an end view of the same. Fig. III is a section showing the device by which the saturated printing-paper or other fabric and the paper to be printed are fed through the press over the printing-type. Fig. IV are detached rollers or cylinders, showing how a number of sheets can be printed at one and the same operation. Fig. V is one of the rollers for carrying a number of narrow strips of saturated colored paper or other fabric across the face of the type. Fig. VI is a cross section of the movable platen, with its impression-lever, showing the manner in which the printed impression is made. Fig. VII is a top view of one of the movable platens. Fig. VIII is the upper side of the bed with its flanges, movable cross-bars for holding the type in position, and an improved type-holder. Fig. IX is a vertical view of one of the flanges, showing the manner of its attachment to the bed of the press. Fig. X is the under side of the bed of the press. Fig. XI is a skeleton paper-holder or fly for holding saturated printing-paper. Fig. XII is a view of the multiform paper-holder for use when required to print detached leaves of paper, cards, envelopes, &c.

A is the frame of the press, held together by the cross-bars *a* and the cross-rods B, and the latter being held securely in place by the screw-nuts *b*.

c is the front end of the movable platen C. D is an impression-lever journaled into the platen at the dotted lines *d*, Fig. VII, and more clearly seen at *d* in Fig. VI.

At *d'*, in lever D, is a hook or crow-bill with an inner wedge-shaped surface, made to impinge against the under side of the rod B when operated by the lever D and made to engage the rod B. The wedge shape is shown by the dotted line extending from the cross-rod B to the hook or crow-bill, at *d'*.

For convenience in description, I will call the two cross-rods B the "front" and "rear" cross-rods B. The movable platens C C are journaled to the rear cross rod B at *c'*, and are made to move laterally over the whole surface of the bed of the press, so as to enable them to make a printed impression in any desired part of the bed without printing any other part of a sheet that may lay for the time being on the press. There are two or more of these movable platens, one of which may be used to print a letter or bill head, and the other to print the name, date, &c., after a letter has been printed, without again printing the head; or, after the letter has been written by pen or type-writer, the name may be printed at the end thereof in any part of the sheet. These platens, being pivoted on the rear rod B, may be swung upward, so as to admit of laying the sheet to be printed on the face of the type, and then brought down, and when down the lever D is raised, and the hook or crow-bill made to engage with the front cross-bar B, and as the lever is pulled over, the wedge-shaped surface, acting on the under side of the cross-rod, depresses the platen, thus making the printed impression.

It will be seen that in this device I have the advantage of the lever and wedge, the wedge acting on the lower edge of the bar B, forcing down the platen, and thus insuring a good impression.

Fig. X is the under side of the bed of the press, so constructed that it may be raised or lowered, so as to regulate the impression on the type. E are diagonal braces in the casting for strengthening the bed. Four holes —one at each corner, at *e*—are countersunk to receive the ends of set-screws, as seen at F in Fig. II, by means of which the bed is raised or lowered to regulate the impression.

Fig. VIII is the upper side of the bed H, in

which, at G, are provided flanges for holding the form of type in the bed. G, Fig. IX, is a front view of one of these flanges, in which, at *g*, is a recess running nearly across the bed. H' is the edge of the bed, to which these flanges are securely fastened by screws, as seen at *h*. These flanges are secured to the bed so as to be flush with both edges thereof, and thus a slot is formed by the recess *g*.

I are one or more cross-bars, made to slide back and forth in this slot *g* over the whole length of the bed, for the purpose of holding the type in any desired part thereof. These sliding cross-bars are held securely in place by thumb or other nuts, *i*, thus firmly holding the type in position. These cross-bars may be slotted, so as to hold type for the name of a writer, with date or other useful matter, and thus may be made to move to the end of a long or short letter, as may be required, after the letter has been written by pen or otherwise. This device is clearly seen in the drawings, Fig. VIII, at R.

Ink may be applied to the face of the type in this press as in any other; but it is my purpose generally to dispense with its use and to substitute therefor paper, or other fabric saturated in pigment, for dry printing, and which, when dry or partially dry, is placed between the type and the paper to be printed. I do this as follows, viz: At J, Figs. II and III, are seen rollers extending across the press and at both ends thereof. Upon these rollers I wind my prepared paper and let it extend across the whole length of the press, over the face of the type and between the face of the type and the platen. By laying the print-paper on the top of this prepared paper or other prepared fabric over the type and drawing down the platen, as above described, I make my printed impression in one color. At J', I insert a second pair of rollers, turned into a set of continuous reels, as seen at J' in Fig. V. These I fill with narrow ribbons, of paper, silk, or other suitable fabric, saturated in different colors from that of the base paper before alluded to, and stretch them over the face of the first continuous sheet, and by printing, as before, I have printed the base in one and the stripes in many colors. The print-paper can be fed in single sheets by hand, as seen in Fig. XII, or from a continuous roll, as seen in the drawings at J^2 in Fig. III.

I find from experiments made that by duplicating the above arrangement I can print several copies at one and the same time. I do this in the manner illustrated in Fig. IV, in which rollers 1, 3, 5, and 7 carry my saturated paper, and rollers 2, 4, and 6 the paper to be printed. By interposing the narrow strips of paper over the rollers 3, 5, and 7, as in the process above described, I can print several copies in colors at one and the same impression.

Rollers for carrying colored strips can be arranged to carry the strips across the press diagonally as well as longitudinally, and thus give checkered printing in many colors.

Where it is desirable to print a number of copies at one and the same time from single leaves, instead of continuous rolls of paper, I attach to the rollers J or to the frame of the press a number of thin fly or paper frames or holders. Said flies may be made of card-board or thin metal frames, as shown at Q, Fig. XI. Over these flies are stretched the saturated printing-sheets. At the lower end of each of these flies I make two or more perforations, by means of which they are kept in place on an open ring, which acts as a common hinge, holding them in place and admitting of their being lowered or raised, or opened and shut, like the leaves of a book. This device is seen at Fig. XII, in which K is the open ring, two of which are made to slip over the rod or roller J, at *j*, as seen in Fig. II, one at each end of said roller. The aperture *j* in Fig. XII is that through which the roller passes when placing the open rings or fly-holders in position. The flies being threaded or hinged on the open rings are in position to be folded down upon the face of the type T, lying on the bed of the press. In Fig. XII all but one are seen in fan shape standing at L. The one at L' is turned down on the face of the type. One being thus brought down on the type, I now lay on it a loose sheet of paper to be printed. I then bring down a second fly, with its saturated paper, and place it on a second loose sheet of paper to be printed, and so continue until I have brought down as many as can be clearly printed at one operation, and when all are thus ready I bring down the platen and make the impression in the manner previously described.

By stretching the narrow ribbons across alternate flies printing in colors can be done as in the above-described method; but in order to do printing either on rolls of paper or loose sheets both devices are necessary in every press—one for rolls and one for loose sheets.

One object of my invention is to supply a press for office or popular use; and to this end I have endeavored to simplify the method of holding type in the bed of the press, by inventing a new and useful type-holder, which consists of any desired number of strips or plates of metal, in each end of which I drill holes, through which connecting screw-rods are passed. The outside plate is tapped at each end to receive the screw-rods. I divide these strips by means of slotted plates of the exact thickness of the type to be used, leaving the openings to receive the type, and I make them changeable, so as to receive different kinds of type. The short dividing-plates are slotted, so as to admit of their being pushed against the rows of type to hold them securely in place, and the slots are open at one end, so that the plates can be readily withdrawn and others of greater or less thickness inserted, as the different thickness of type may demand.

When the desired form is set up, it is securely locked by means of the rod running through the whole. This device is shown in its true place—on the bed of my press, O, Fig. VIII, in which M is one of the plates, lying on its side, with the holes drilled through the two ends *m m*.

N is the slotted dividing-plate, also lying on its side. At *n*, in M, the slotted plate is seen in position.

P P are the connecting and locking rods, passing through the series of plates to *p p*, where they are tapped into the plates. The writing on the form is designed to show how the dividing slotted plates are used for different thicknesses of type.

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

1. The combination, with the type-bed, of a platen, pivoted, substantially as described, so as to be capable of lateral as well as vertical movement.

2. The combination, with the type-bed, of a series of independently-pivoted platens.

3. The combination, with the type-bed, of a series of independently-pivoted and laterally-movable platens.

4. The combination, with the pivoted platen and adjustable bed, of the operating-lever pivoted directly to the platen, and the cross-rod extending the whole length of the press-frame, the lever engaging the rod after the manner of a wedge.

5. In combination with the bed and platen a series of holders furnished with saturated paper or strips, the strips being of different colors, whereby several impressions in one or more colors may be made at once.

6. In combination, the slotted bed-frame and the laterally-adjustable type-holders.

7. The type-holder composed of perforated bars, interposed slotted adjustable and interchangeable strips corresponding to the thickness of the type, and the clamping or locking-up screws.

THOS. D. WORRALL.

Witnesses:
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