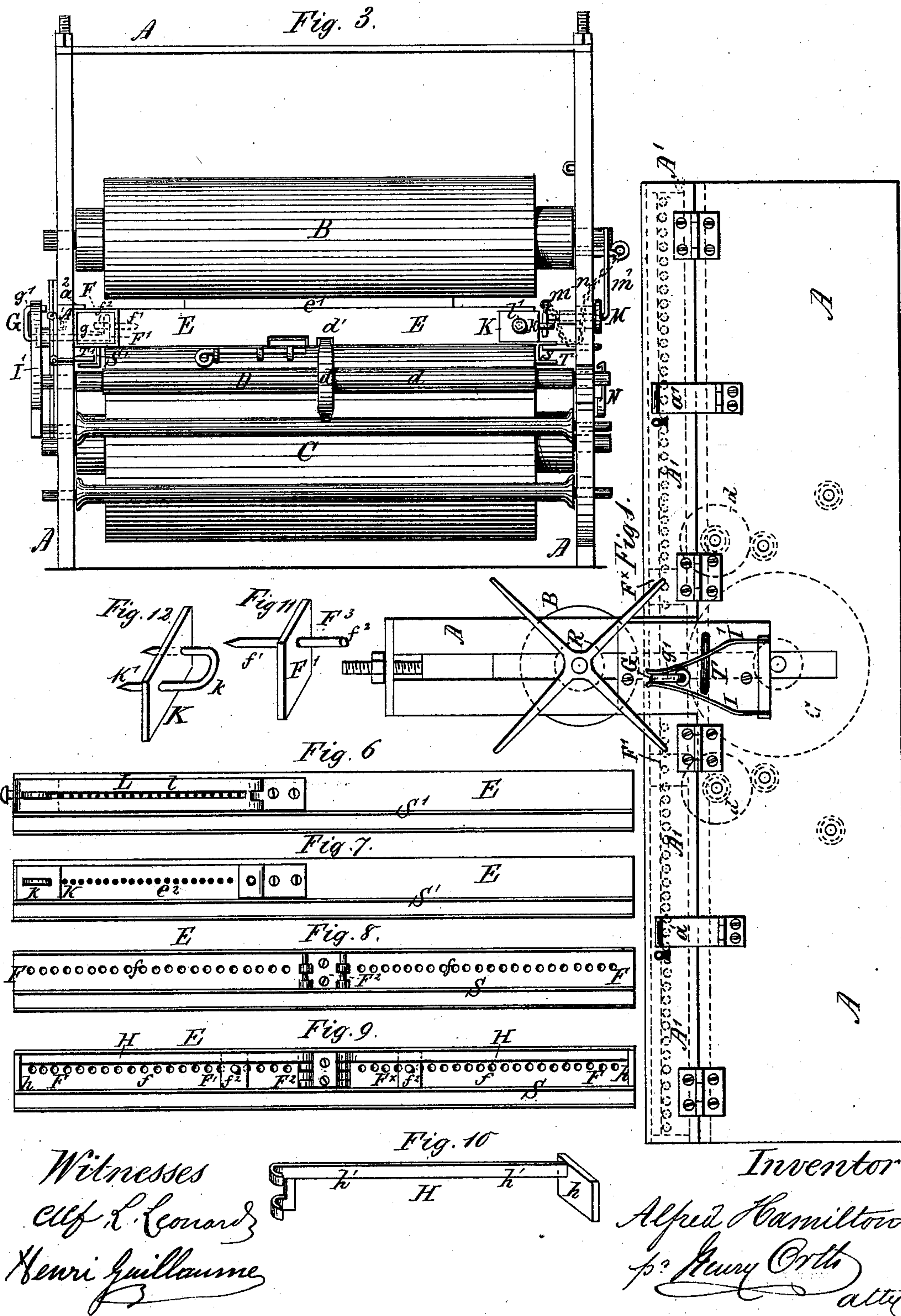


A. HAMILTON.
Plate-Printing Machine.

No. 216,397.

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UNITED STATES PATENT OFFICE.

ALFRED HAMILTON, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN PLATE-PRINTING MACHINES.

Specification forming part of Letters Patent No. **216,397**, dated June 10, 1879; application filed February 19, 1879.

To all whom it may concern:

Be it known that I, ALFRED HAMILTON, of the city of Washington, District of Columbia, have invented new and useful Improvements in Printing-Presses, of which the following is a specification.

My invention relates more particularly to improvements in devices for recording the number of impressions taken from a plate, and to means whereby the registering devices may be secured from being tampered with, as hereinafter described, and shown in the accompanying drawings, in which—

Figures 1 and 2 are opposite side elevations, and Fig. 3 an end elevation, of so much of a hand-press as will be necessary to fully illustrate my invention. Fig. 4 is an under-side view of the plank or traversing bed, and Fig. 5 is a section of the same on line *xx* of Fig. 4. Figs. 6 and 7 are elevations of one side of the plank, illustrating the devices for locking the same in position. Figs. 8 and 9 are like views of the opposite side of the plank, illustrating the adjustable registering devices; and Figs. 10, 11, 12, and 13 are detail views.

In printing-presses provided with mechanism for registering the number of impressions taken from a plate, as heretofore constructed, said mechanism is operated from either the upper pressure-roll or the lower supporting-roll, which is undesirable in many respects, but chiefly because the printer has no means to adjust either of the rolls or the blankets on the pressure-roll, or even the plate and lifters, without thereby affecting the registering mechanism; nor did such machines afford the necessary safeguards against the tampering with the registering devices, either during the operation of printing or after the printer has ceased to work.

In the printing of bank-notes, securities, or other like evidences of indebtedness, an accurate registering of the number of impressions taken, as well as absolute safeguards against the tampering with the registering devices either during or after working-hours, is a great desideratum.

The object of my invention is not only to provide means for recording the number of impressions, but also to place the press in full control of the printer for the adjustment of

any part of the operating mechanism without thereby affecting the registering devices, or enabling the operative to tamper with the latter, and to secure said registering devices from being tampered with after working-hours; and to that end my invention consists, first, in operating the registering devices from the plank or traversing bed, to permit of the adjustment of rollers, blankets, plate, and lifters without affecting said registering devices; secondly, in means for adjusting the registering devices to the dimension or fractional dimension of the plate from which the impressions are taken; thirdly, in means whereby said devices, when once set or adjusted, may be locked in position and be safe from being tampered with except by the person or the consent of the person superintending the printing; fourthly, in means whereby the traversing motion of the plank may be arrested in proper time, according to the size of plate from which the impressions are taken; fifthly, in making the stops of the plank adjustable thereon, so as to set them according to the size of plate from which the impressions are taken, and when so set lock them in position safe from being tampered with except by the person or the consent of the person superintending the printing; sixthly, in means whereby the traversing bed may be locked against vertical displacement without thereby interfering with its traversing motion; seventhly, in means whereby said traversing bed may be locked against horizontal motion, and so held until released by the person or the consent of the person superintending the printing; and, lastly, the invention consists in certain details of construction and arrangement, all as hereinafter fully set forth.

In the accompanying drawings, A represents the main frame, constructed of any suitable material, and adapted to receive and support the operating devices. B represents the upper pressure-roll; C, the lower supporting-roll, and D D the guide-rolls, carrying the anti-friction pulleys or disks *d d*, traveling in a groove, *d'*, in the under side of the traversing bed, all of which are mounted in the main frame, as usual.

E represents the traversing bed; *e*, the plate from which the impressions are taken, and *e'*

e^1 the lifters, all arranged and adjusted upon the bed in the ordinary way.

F represents a casing formed on or attached to one side of the bed E, and extending the whole length thereof. The casing is open in front and at both ends, except when locked, as hereinafter described. It is provided with two series of pin or bolt holes, f , on opposite sides of a central hinge-plate, F^2 , said holes penetrating into the traversing bed for the reception of the ends f^1 of the pins or bolts F^3 , projecting inwardly from one side of the register-plates $F^1 F^x$, as shown in dotted lines, Fig. 1, and full lines, Figs. 8, 9, and 11, whereby said plates $F^1 F^x$ may be adjusted along the bed according to the dimension, or fractional dimension, of the engraved plate, while the ends f^2 of the pins F^3 project outward from the opposite sides of plates F^2 into the casing F.

G is a crank-lever, pivoted in the main frame, whose crank-arm g lies in the center, or about the center, of the path of the traversing bed. Said arm projects into casing F, and lies in the path of the register-plates $F^1 F^x$, on opposite sides of arm g of lever G, as shown in dotted lines, Figs. 1 and 3. The arm g' of lever G is connected, in any usual manner, with the train of gearing of any of the well-known registering or recording gears, and the arm and gearing are, as usual, inclosed within a locked casing, to prevent their being tampered with.

As arranged and shown in dotted lines, Figs. 1 and 3, if the traversing bed is moved out toward the right, and the plates $F^1 F^x$ properly set, and the inked plate placed in proper position for printing, the pin of the plate F^1 will, when the traversing bed is now moved toward the left, first actuate the arm g of lever G, causing the arm g' of said lever to move the indicator of the registering device one step. When the traversing bed has nearly reached the limit of its reciprocating motion toward the left, as adjusted by the registering-pins—that is to say, when the plate from which the impression is taken is about to pass from under the roller—the pin of the plate F^x will in its turn actuate the lever G, and cause the indicator to advance a second step. Thus we have each motion of the bed registered, or two steps for each impression, from which the number of impressions after a day's work may be readily deduced. It is evident that if the register-pins were set very far apart toward the opposite extremities of the bed and the plate e were very small, the impressions could not be recorded, as the traversing motion of the bed could then be so limited as to prevent the pin from engaging the lever-arm. On the other hand, when very large plates are employed, upon which separate and distinct evidences of indebtedness are engraved, it is desirable, or may be desirable, that each set should be registered or recorded, which may be readily effected.

In the first case the non-registering is prevented by the superintendent setting the reg-

istering-pins with each plate in such manner that the pin will strike the arm when the plate upon the bed has reached, or is about to reach, the pressure-roll B in the traversing motion both ways; and, in the second case, each section of the plate e may be registered by employing a register-plate, F^1 and F^x , for every such section, and setting them in proper position.

It will thus be seen that the registering devices may be adjusted to the plate, or the sections of a plate, from which the impressions are taken, the registering being therefore governed by said plate.

The arms $g g'$ of lever G, when released by the pins of plates $F^1 F^x$, are returned into their normal position by the springs I I', respectively. (See Figs. 1 and 3.) In order to hold the register-plates $F^1 F^x$ firmly in position when set, I employ straps H, hinged at one end to the central hinge-plate, F^2 , and provided at the opposite end with a plate, h , which latter, when the straps are in position so that the arm h' thereof will be above the pins of the registering-plates $F^1 F^x$, to clamp them to the back of the casing and bed, will accurately fit and close the ends of said casing, (see Figs. 3, 8, 9, and 10,) and prevent any interference with the registering mechanism from those ends.

When the register-plates $F^1 F^x$ have been properly set, the front of the casing is closed by means of a rail or lid, A' , hinged to frame A, Figs. 1, 2, and 3, which overlaps the casing F, as shown in Figs. 2 and 3, at a^2 . This rail or cover may be locked in any desired manner—for instance, by means of latches and padlock, or by means of latches a^1 and keys, or in any other manner—to prevent their being opened without the consent of the superintending officer.

The top of the casing F may be provided with a series of index lines or numbers corresponding in location with that of the holes f , whereby the register-plates $F^1 F^x$ may be set more readily.

Instead of the strap H, constructed as described, and shown in Fig. 10, a strap of a width equal to, or nearly equal to, that of the casing F may be employed, said strap being provided with a longitudinal slot, through which the registering-pins project when the strap is in position to lock the plates $F^1 F^x$, as will be readily understood.

When the printer has ceased to work, the traversing bed is locked to the frame A, in the position he left it, by means of a slotted strap, L, adapted to clamp an adjustable plate, K, provided on one side with a pin or pins, and on the opposite side with a loop or eye, k , adapted to pass through the slot l of the strap L, which latter is hinged to the traversing bed on the side opposite to the registering devices, the bed being recessed to receive the strap, and provided with a series of adjusting-holes, e^2 , for the reception of the pin or pins k' of the plate K. (See Figs. 2, 3, 6, 7, and 12.) The locking is effected by means of a crank-

lever, M, pivoted to the main frame, the arm *m* of which engages with the loop or eye *h* of plate K. The arm *m'* of lever M is arranged to be locked to the main frame by means of a latch and lock or padlock, or in any other convenient manner, to prevent the bed from being released except by the consent of the superintendent.

Instead of making the locking-plate K adjustable upon the side of the bed, the attaching device may be made adjustable. For instance, chains or other like means connected rigidly with the traversing bed on opposite sides of the central standard may be employed and locked to said standard; or the chains may be rigidly connected with the frame and shackled to the bed to lock it in position.

The locking-arm *m* of the lever M, when released from the bed, is held out of the path of the latter by hooking the arm *m'* to spring-lever N, attached to the frame, Figs. 2 and 3, or by means of a chain or cord, *n*, whereby said lever-arm may be hung to a staple on the standards. The hinged strap L is held in position, when unlocked from lever M, by a pin, *l'*, passing through the end of the strap into the bed, as shown by Figs. 2, 3, and 6.

The traversing motion of the bed is regulated by the dimensions of the plate *e*, as follows: The under side of the bed is recessed, and has secured therein centrally a hinge-plate, Q, to which are hinged two slotted straps, P, engaging with the staples *p*, attached to the traversing bed at each end of the recess, which is further provided with a series of pin or bolt holes, *e*³, for the reception of the pin or pins *o* of the adjustable stop-plates O O', Figs. 4 and 5. These plates are mounted and slide to and fro upon the straps P, each plate having a segmental stop, *o'*, upon the face opposite to the pins, these stops being so arranged as to come in contact with the lower supporting-roll, C, when the bed has reached the limit of its traversing motion. (See Figs. 4, 5, and 13.)

By means of the holes *e*³ the stops may be adjusted longitudinally on opposite sides of roll C, according to the dimensions of the plate from which the impressions are taken, to stop the movement of the bed as soon as the roller B has left the plate and has reached the lifters, the position of the stops being regulated by the plate *e*, and consequently by the registering devices.

The straps P are locked to the bed by means of bolts *p'*, passing through the latches or loops *p*, and the former are securely locked to the bed by any convenient means; or the straps P may be provided with hinged latches P', Fig. 5, fitting over the ends of the bed, to which they can be locked by lock and key, and prevent the tampering with the stops when once set.

From what has been said it is evident that the registering mechanism is securely locked or guarded, and cannot be tampered with, except in two ways, and that is by either raising

the upper roll, B, to lift the traversing bed clear of the register-pins, or by depressing the roll C and the bed to clear the arm *g* of lever G out of the path of said pins. I guard against this vertical displacement of the traversing bed by the following devices: S S' are guideways attached to or formed on opposite sides of the traversing bed, and extending the whole length thereof. T T' are pins or bolts secured to the main frame A, or the standards thereof, and project into the guideways S S', respectively. These pins or bolts are so arranged that the bolts T will bear against the inner upper face of guideway S, and the bolts T' upon the inner lower face of guideway or groove S', thereby practically preventing the traversing bed from being either lifted or depressed sufficiently to clear the arm of the lever G out of the path of the register-pins, while the arrangement admits of sufficient displacement vertically of the bed to permit of the adjustment of the blankets, lifters, and plate *e*, as plainly shown in Fig. 3.

It will therefore be seen that the printer has full control of all the operating mechanism of the press to adjust the same when this becomes necessary, and shift both the pressure and supporting rolls in their bearings, to prevent the unequal wear of their shafts, while he has no access to the registering devices.

Having now described my invention, what I claim is—

1. In a printing-press in which each impression or part thereof is registered through the medium of the traversing motion of the plank or bed, the combination, with said bed and the adjustable actuating mechanism connected therewith, as described, of suitable transmitting or recording devices, as and for the purpose specified.

2. In a printing-press, the combination of the plate from which the impressions are taken, the traversing bed, and its actuating mechanism, adapted to be adjusted to the size of said plate or any fraction thereof, as described, of the transmitting or recording devices, as set forth, whereby each impression or fraction thereof is registered and the registering controlled by the plate, substantially as and for the purpose specified.

3. In a printing-press, the mechanism, substantially as described, for limiting the traversing motion of the plank, adapted to be adjusted to the dimension of the plate from which the impressions are taken, as and for the purpose specified.

4. In a printing-press, the combination of the main frame, the supporting and pressure rolls, the traversing bed, the registering mechanism, and means, substantially as described, for limiting the vertical displacement of the bed independently of the supporting and pressure rolls, to prevent the registering devices being tampered with, as and for the purpose specified.

5. In a printing-press, the combination of the main frame, the traversing bed, and mech-

anism, substantially as described, for locking said bed to the main frame against horizontal displacement, in whatsoever position the bed may be upon the supporting-roll when left by the printer, until released by the person in charge or superintending the work of the press, as and for the purpose set forth.

6. In a printing-press, the combination of the main frame, the traversing bed, the registering mechanism, mechanism, substantially as described, for locking the bed to the main frame against horizontal displacement, and the mechanism, as described, for locking said bed against vertical displacement independently of the supporting and pressure rolls, all arranged and operating as and for the purpose specified.

7. In a printing-press, the traversing bed, the registering mechanism connected therewith, the transmitting devices, and the main frame, and means, substantially as described, for locking said traversing bed to the main frame without interfering with its traversing motion, and inclosing the registering devices to prevent their being tampered with, all combined and operating substantially as and for the purpose specified.

8. In a printing-press, the combination of the main frame, the plank or traversing bed, and the mechanism, substantially as described, for registering each impression with the operating or printing mechanism, the plate from which the impressions are taken, and the lifters, all arranged in relation to each other so that the operating or printing mechanism, plate, and lifters may be adjusted without affecting the registering devices, substantially as and for the purposes specified.

9. In a printing-press, the combination, with the traversing bed or plank and the plate from which the impressions are taken, of mechanism, substantially as described, for registering each impression and for limiting the traversing motion of the bed, both adapted to be adjusted to and regulated by the dimensions of said plate from which the impressions are taken, as and for the purposes specified.

10. In a printing-press, the traversing bed E and the adjustable registering-pins F^3 , in combination with the actuating-lever G and the springs I I', whereby the movements of said lever are adapted to actuate a registering apparatus, and the lever returned in its normal

position whenever acted upon by the registering-pins, substantially as described, for the purpose specified.

11. The traversing bed E, provided with a series of holes, f , the casing F, and the removable registering-plates $F^1 F^x$, carrying pins F^3 , in combination with the lever G and springs I I', substantially as described, for the purpose specified.

12. The traversing bed E, casing F, and the registering-plates $F^1 F^x$, in combination with the hinged straps H and their end plates, h , substantially as described, for the purpose specified.

13. The traversing bed E, casing F, registering-plates $F^1 F^x$, straps H, and their end plates, h , in combination with the main frame A and hinged rails or lids A', substantially as described, for the purpose specified.

14. In a printing-press, the traversing bed E, provided on one of its sides with a series of pin or bolt holes, e^2 , the slotted strap L, and locking-plate K, in combination with the lever M and the main frame A, all constructed and operating substantially as and for the purpose specified.

15. In a printing-press, the traversing bed E, carrying on its opposite under sides the guideways S S', in combination with the bolts or pins T T' and the main frame A, for limiting the vertical displacement of the traversing bed, and preventing the tampering with the registering-pins, as set forth.

16. In a printing-press, the traversing bed E, carrying the stops O O', in combination with the supporting-roll C, whereby the traversing motion of said bed is limited, in the manner and for the purposes substantially as described.

17. The traversing bed E, provided with a recess and a series of holes, e^3 , the slotted straps P, and the sliding stops O O', in combination with the staples p and bolts p' , or their equivalent, substantially as described, for the purpose specified.

In witness that I claim the foregoing I have hereunto set my hand and seal this 15th day of February, 1879.

ALFRED HAMILTON. [L. S.]

Witnesses:

HENRY ORTH,
J. MASON GOSZLER.