

(No Model.)

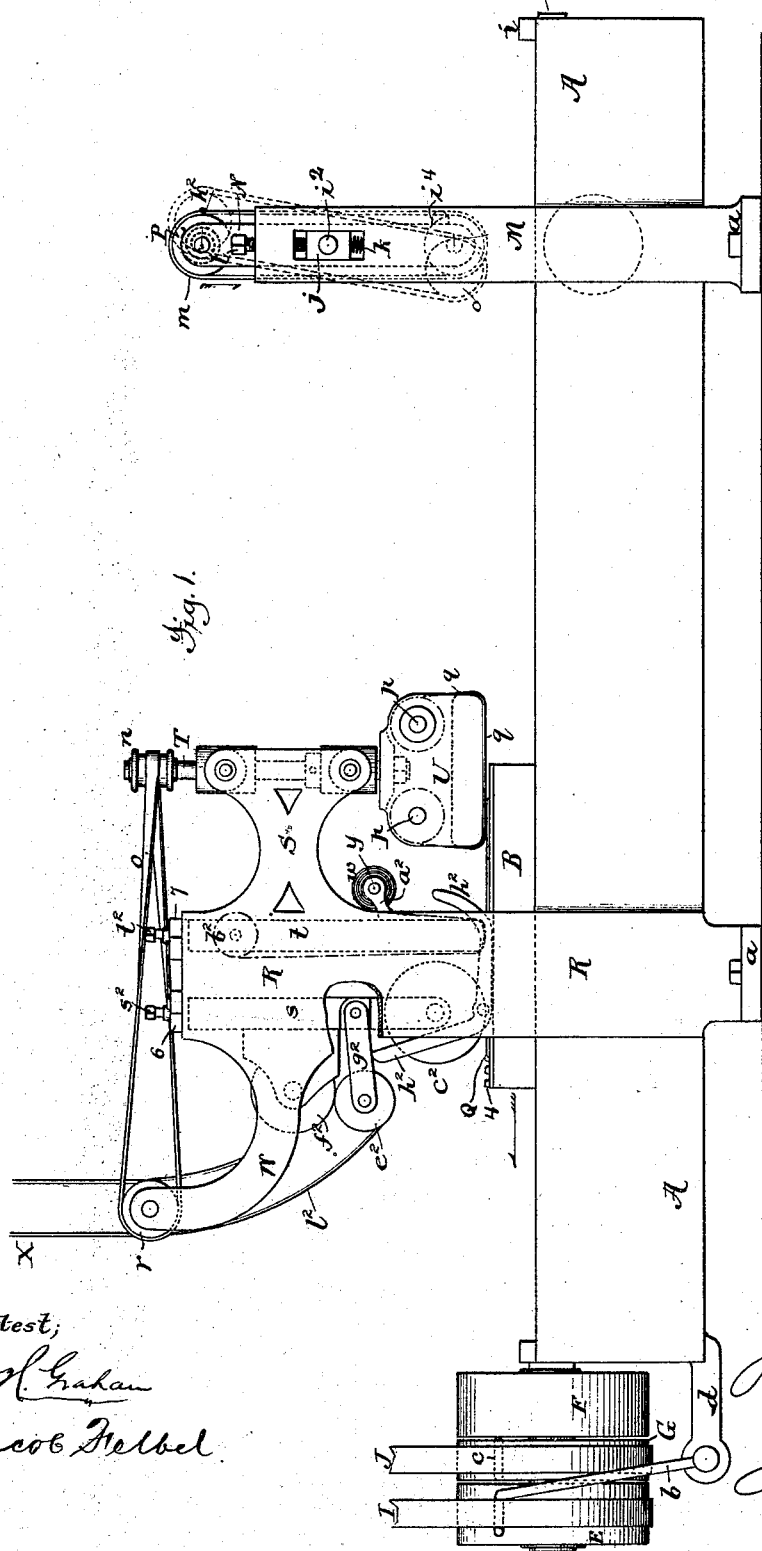
4 Sheets—Sheet 1.

J. S. IVES.

PLATE PRINTING MACHINE.

No. 261,927.

Patented Aug. 1, 1882.



Attest;
Edw. Graham
Jacob Helbel

Inventor,
J. S. Ives.
per
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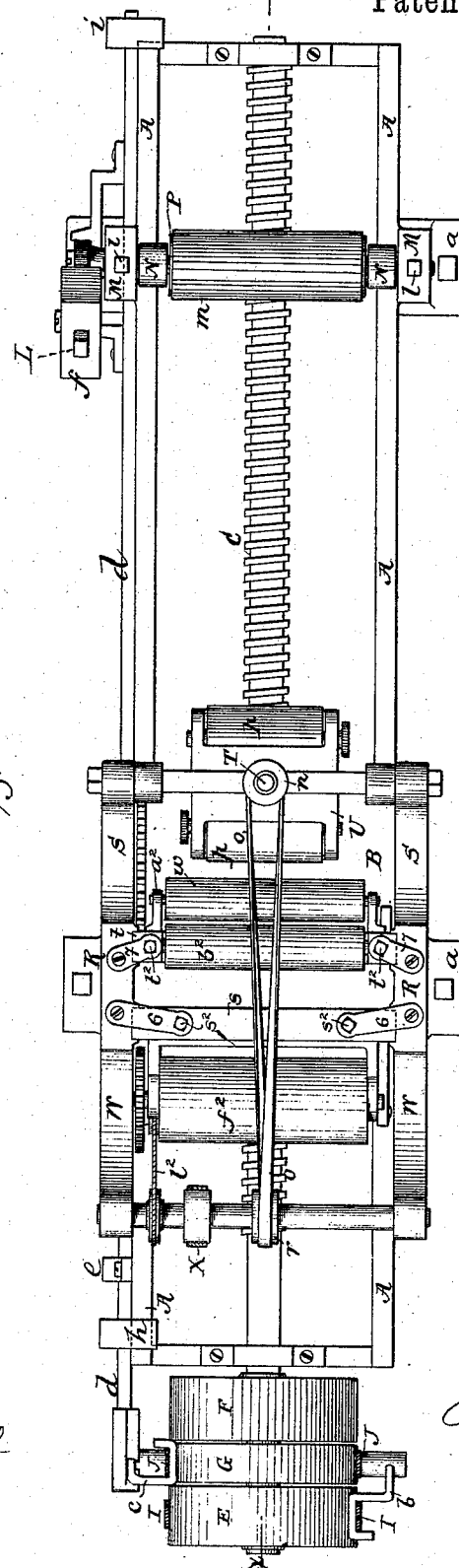
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Fig. 2.



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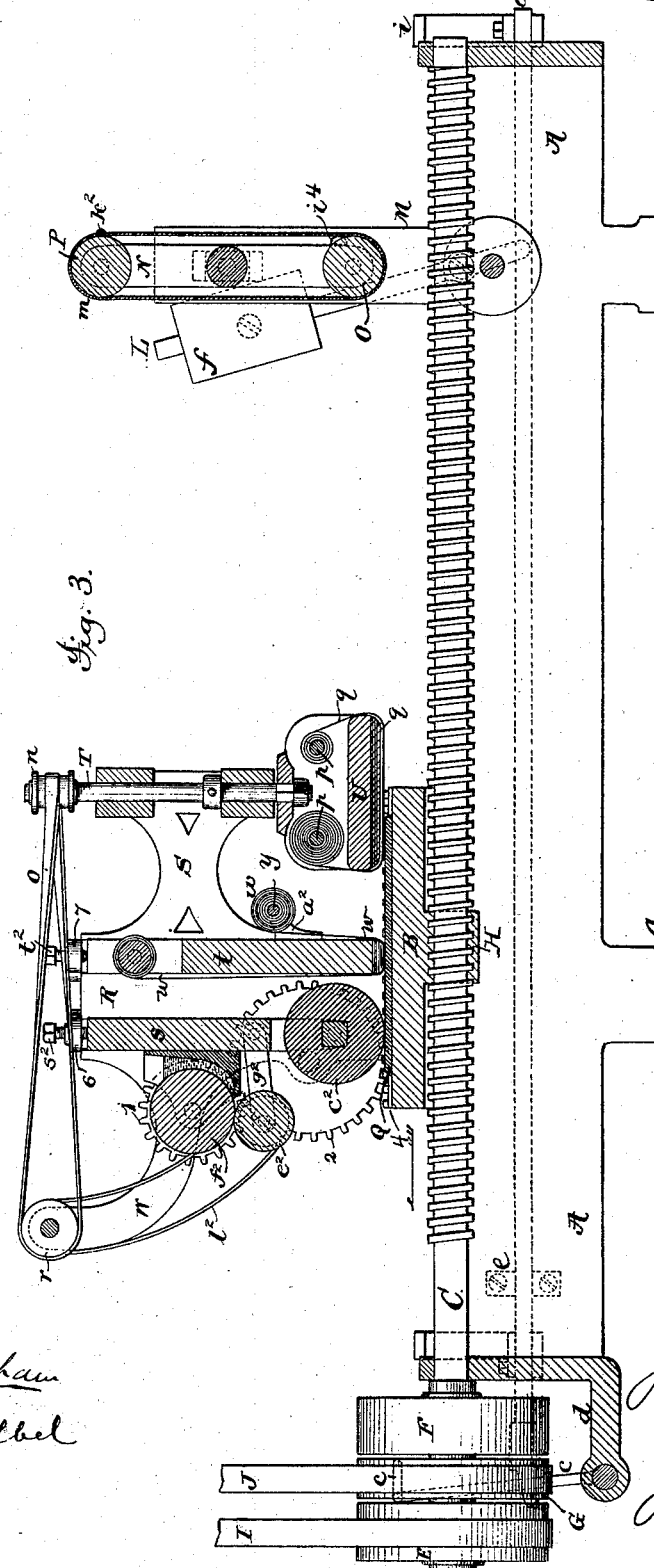
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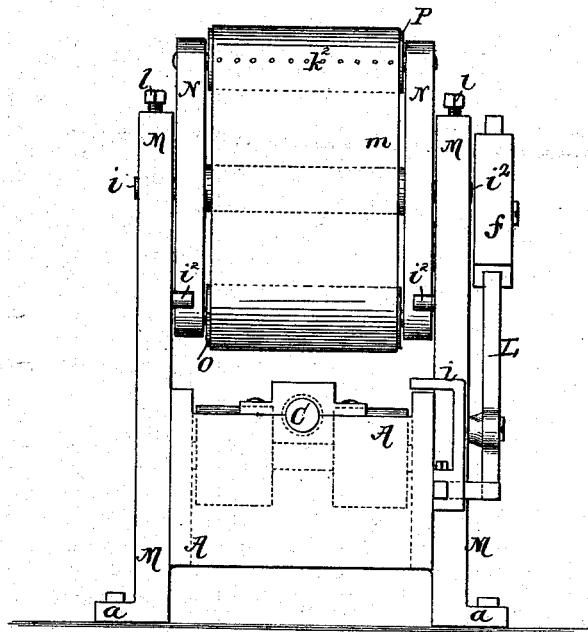
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Fig. 4.



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UNITED STATES PATENT OFFICE.

JOSEPH S. IVES, OF NEW YORK, N. Y.

PLATE-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 261,927, dated August 1, 1882.

Application filed August 3, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH S. IVES, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Plate-Printing Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

My invention relates to certain improvements in machines for doing what is denominated "plate-printing."

Numerous machines have heretofore been devised and employed for this kind of work; but in all of them with which I am familiar the principle of construction and mode of operation have been such that either the machines have been very cumbersome and required two operatives at different localities, one to put on the sheets and the other to take them away from the plates, or have been comparatively complex, liable to get out of repair, expensive to keep in running order, and very noisy in their working movements, or have embodied all of these objections.

My invention has for its main object to provide for use a machine for plate-printing constructed and operating so that, while it shall be capable of doing rapidly the finest kind of work in the most satisfactory manner, it shall be exceedingly simple and economic in construction, comparatively noiseless in its working, shall occupy but little space, require only one attendant, and not be liable to get out of repair or perfect running order; and to this main end and object my invention consists in an improved plate-printing press or machine involving the novel features of construction hereinafter more particularly described, and specifically pointed out in the claims of this specification.

To enable those skilled in the art to make and use a machine involving my invention, I will now proceed to more fully explain the latter, referring by letters to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a front elevation; Fig. 2, a plan or top view; Fig. 3, a longitudinal central section, (at the line *xx* of Fig. 2;) and Fig. 4 an end view of a machine made according to my

invention, and showing that manner of carrying out the same in which I have so far successfully practiced the said invention.

In the several figures of the drawings the same part will be found designated by the same letter of reference.

A represents the bed or carriage-frame of the press, which may be properly supported upon either suitable legs or a supporting stand or table. As I have used the machine so far this frame has been simply bolted down onto a table at *a*, so as to be sustained with sufficient firmness and at a proper elevation to bring the top of the carriage B and the plate thereon to a convenient height for the operative to work.

Running longitudinally of the frame A, and about centrally of it widthwise, is a screw-shaft, C, mounted at either end in suitable bearing-boxes in the frame, and provided at one end with two loose pulleys, E and F, and one intermediately-arranged fast pulley, G, all as clearly shown: The said screw-shaft works in a nut, H, in the lower part of the carriage B, and is rapidly revolved in first one and then the other direction by the pulley G, which is driven in first one direction and then the other by the belts I and J, respectively. These belts both pass upwardly to and over a driving drum-pulley overhead, as usual, from which they get their motion, one of them being crossed, so that it will rotate the pulley G in a direction opposite that in which the other belt will drive said pulley. The belts I and J are automatically shipped so as to first run, as shown at Fig. 1, to effect the driving of pulley G first in one direction and then in an opposite direction by shipper-rods *b* and *c*, projecting rigidly upward from a bar, *d*, that is arranged to slide in suitable guide-loops or bearings, *e*, at one side of the frame A. At or near the end of said bar *d* opposite to that at which are located the shipper-rods *b c* is connected the lower end of a vertically-arranged lever or arm, L, that is weighted at *f*, and is hung by a pivotal connection to one of the uprights or side pieces, M M, which support the impression-roller frame N. This weighted arm L, being tipped into one or another position by the periodical longitudinal movements of the bar *d*, serves to insure the retention of said bar in

each of the positions into which it is moved, and to thus effect the retention in place of the belt-shipping mechanism. The said bar *d* is moved in first one and then the other direction at each stroke of the carriage B by those portions of the ends near the rear side of said carriage, striking first one and then the other of the arms or lugs *h* and *i* of said bar *d*.

The impression-roller frame N is formed or provided, as shown, with journals *i*², which are located about centrally vertically of said frame, that run in vertically-adjustable boxes *j*, which are arranged in suitable housings in the side pieces, M, of the machine, and said sliding boxes *j*, which rest on springs *k*, are forced to any desired position, and there held downward by set-screws *l*, arranged as clearly illustrated.

In the lower end of the frame N is mounted, so as to revolve freely on its journals, the impression-roller O, while in the upper end of said frame is mounted a take-up spring-roller, P, the function of which is to merely take up upon its own periphery that portion of the blanket *m* which in the operation of taking an impression is caused to travel with the revolving impression-roller O. The roller P is made and operates after the fashion of the roller of a spring window-shade fixture—that is to say, it is made with an internal spiral spring, the tension of which operates to return the roller to a given position by an axial movement thereof whenever said roller shall have been rotated in an opposite direction to a greater or less extent.

The plate Q, from which the printing is to be done, is applied to the carriage in the usual manner, and is inked and wiped automatically by means which I will now refer to.

The upwardly-projecting side pieces, R, of the machine support a sort of stand, S, in which is hung, so as to freely turn in journal-boxes, and so as to be capable of vertical adjustment, a shaft, T, the upper end of which is provided with a pulley, *n*, by means of which, through the medium of a belt, *o*, said shaft is rapidly rotated, and to the lower end of which is attached the cleaner U. Said cleaner is composed, as shown, of a flat-bottomed block or frame (the dimensions of the bottom of which are such that it will quite cover the plate being printed from widthwise of the latter) and two rolls, *p p*, mounted horizontally in said frame and about parallel to each other, a strip of woven material, *q*, such as generally used for plate-cleaning (a sort of muslin woven for this purpose) being wound on one of the rolls *p*, and passed thence beneath the properly-padded bottom of the frame, and thence on to the other one of the rolls *p* in such manner that by turning one of the rolls *p* whenever occasion may require it (which will be quite seldom) the wiping or cleaning stuff *q* may be drawn along beneath the frame U (unwinding from one and winding up on the other of rolls *p p*) to bring

into use a clean portion thereof. At the other side of the uprights R project bracket-like arms W, in which is mounted a pulley, *r*, from which the belt *o* receives motion, and which is driven by a belt, X, from an overhead pulley.

s and *t* are two narrow vertically-arranged frames, which are located in receptacles in the side pieces, R, within which they are placed and held in a manner such that they can be adjusted vertically, and one of them, *t*, carries the wiper devices, while the other, *s*, carries the inking mechanism.

The wiper device is composed of a web, *w*, of suitable material, wound on a roll, *y*, hung in the arms *a*², and passed thence beneath the horizontal bar or edge of frame *t*, and thence upward to the winding-up roll *b*² of the frame *t*, said roll *b*² being automatically turned on its axis by a ratchet-and-pawl mechanism operated from the carriage B at each stroke, so as to bring a fresh part of the web *w* to the lower edge of the frame *t* to wipe the plate each time it is inked.

The inking mechanism shown consists of a rubber inking-roller, *c*², which is supplied with ink from a distributing-roller, *e*², that periodically runs first in contact with it, and then with a roller, *f*², which supplies ink to the said distributor from an ordinary fountain. As before remarked, the inking mechanism is carried by the frame S. The details of its construction are not peculiar, except that the roller *c*², which is hung in vibratory arms *g*², as shown, is lifted out of contact with the inking-roller and into a position to receive ink, while the carriage B and its plate travel beneath the roller *c*², by the action of said carriage on an angle-lever, *h*², in the manner clearly illustrated at Fig. 1.

The general operation of the machine may be thus explained: As the carriage B, carrying the plate Q, travels toward the end of its stroke, going in the direction indicated by the arrow at Fig. 1, the plate is inked by the roller *c*², and, as it reverses its motion and begins its stroke in the opposite direction, is again submitted to the action of the inking-roller. The inked plate then passes beneath the wiper-web *w* of frame *t*, and by it the surface inked is wiped off, and as the carriage moves along still farther the inked plate is subjected to the action of the rapidly-revolving cleaner device U, the cloth *q* of which finally prepares the plate for the reception of the paper. The paper is then properly laid on the plate in the usual condition and manner, and the carriage farther proceeds in the direction of the impression-roller O, beneath which roller the plate and the sheet of paper thereon are passed, the lower end of the oscillatory frame N being pushed home against a stop-pin or abutment, *i*⁴, by the action of the parts which effect the operation of taking the impression. While the impression is being taken the turning of the roll O causes the blanket *m* to move

in the direction indicated by the arrow at Fig. 1, thus turning round on its axis the spring-roller P, over the periphery of which said blanket passes, and to which it is fastened at h^2 ; but by the action of said spring-roller P the blanket is returned to its former relative position when the roller O has been relieved of pressure. Of course the size of roller P must be such relatively to the size of the plate that one-half the circumference of the said roller will be at least equal to the entire length of the run or travel of the plate in one direction beneath the impression-roll, which will usually be a little more than the length of the engraved portion of the said plate. The carriage now reverses its movement and travels back, and as the plate passes beneath the impression-roller on the return movement the frictional contact of the parts merely operates to swing the frame N in the direction indicated by the position of it in dotted lines at Fig. 1, so as to avoid any effective pressure on the work during the return movement, and the work is then removed by the operative. During the travel thus of the carriage toward, under, and back from the impression-roller the distributor c^2 has been running in contact with and revolving by contact the inking-roller c^2 , the said distributor being at such time rotated by a belt, l^2 , by which its shaft is driven from the pulley r ; but as the carriage strikes the cam-like end of the angle-lever h^2 the distributor is lifted into the position seen at Fig. 1, and the inking-roller c^2 again inks the plate. While lifted into the position seen at Fig. 1 the distributor is rotated by peripheral contact with the ink-supplying roller f^2 , (the belt l^2 having been slackened up so as to be inoperative,) which is, during the time of the inking of the plate, kept in motion by the train of gears 1 2, the latter of which is driven from a rack, 4, on the top of the carriage B, near its back edge.

The rollers p p are preferably turned by hand when necessary to shift the cleaner-web q , since this has to be done very seldom; but the wiper-cloth w is of course shifted automatically at each movement of the carriage and plate.

Of course the detail of construction of the mechanism by which, through the movement of the carriage, the roll y is turned to shift the wiper web or cloth w (to bring a clean portion in position to act on the plate) is not important, and may be varied without changing the nature of my invention.

The frames s and t are each held down by set-screws s^2 and t^2 , acting respectively on their upper ends and working in pivoted shoe-pieces 6 and 7, which latter may be turned to one side on their pivots out of the way, to permit the lifting out bodily (from their housings in the uprights R) of the said frames s and t .

It will be seen that in a machine arranged as that herein shown and described not only are

the reciprocatory movements of the plate-carrying carriage effected at the requisite speed in a noiseless manner and without the liability of any such unsteadiness of motion as is apt to exist in machines in which the bed is driven by gearing, (that is always subject to backlash,) but that, furthermore, there will be a greater perfection of action in the movement of the plate beneath the impression-roller than is possible in the ordinary plate-printing machines, in which either gears and racks or some sort of crank-motion is employed to drive the carriage, because the screw-propelling device will force the bed along with a smooth and steady motion, and will not tend in the least to lift the free end of the carriage in its effort to force the plate beneath the impression-roller, but will, on the contrary, operate to hold and keep the carriage on which the plate is fastened in the proper plane of movement.

The cleaner U, which should revolve rapidly, moves continuously, and is extremely simple and easily kept in perfect repair and adjustment, and, though it might be, does not need to be raised up during the return of the plate to be reinked and cleaned off.

By the simple contrivance of the pivoted frame N, carrying the impression-roller at its lower end and adapted to work as described, the machine is made capable of the best results as to the printing, while at the same time great simplicity of construction, great durability, and little liability of derangement are insured.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a plate-printing press, the combination, with a suitable bed or frame, A, provided with an impression-roller and an inking mechanism, of a plate-carrying reciprocatory carriage, B, suitably mounted on said frame, and a screw-shaft adapted to move said carriage back and forth, all substantially in the manner and for the purposes set forth.

2. In combination with the bed and carriage of a plate-printing press, an impression-roller mounted in a movable frame and adapted to be drawn down into a position to do the printing and to be elevated out of such position by the rolling action of the work and plate against the periphery of the said impression-roller, as set forth.

3. In combination with the bed or frame on which travels the reciprocatory carriage of a plate-printing press, inking, wiping, and cleaning devices, all mounted in one frame in close proximity to each other and at a sufficient distance from the impression-cylinder of such a press as to permit the putting onto and removal from the plate of the paper to be printed while the plate is traveling between the impression-cylinder and the group of devices recited, as set forth.

4. In combination with the plate-carrying

carriage B and the bed or frame A of the machine, the inking, wiping, and polishing mechanisms mounted in one frame or stand, a single drive-pulley, *r*, mounted in said stand
5 and imparting all the rotatory motions necessary to the said mechanisms, and means, substantially as described, by which the carriage B is made to effect the lifting of roll *e*²

of the inking mechanism, all in the manner described. 10

In witness whereof I have hereunto set my hand this 7th day of July, 1881.

JOS. S. IVES.

In presence of—

JACOB FELBEL,

HARRY JAMIER.