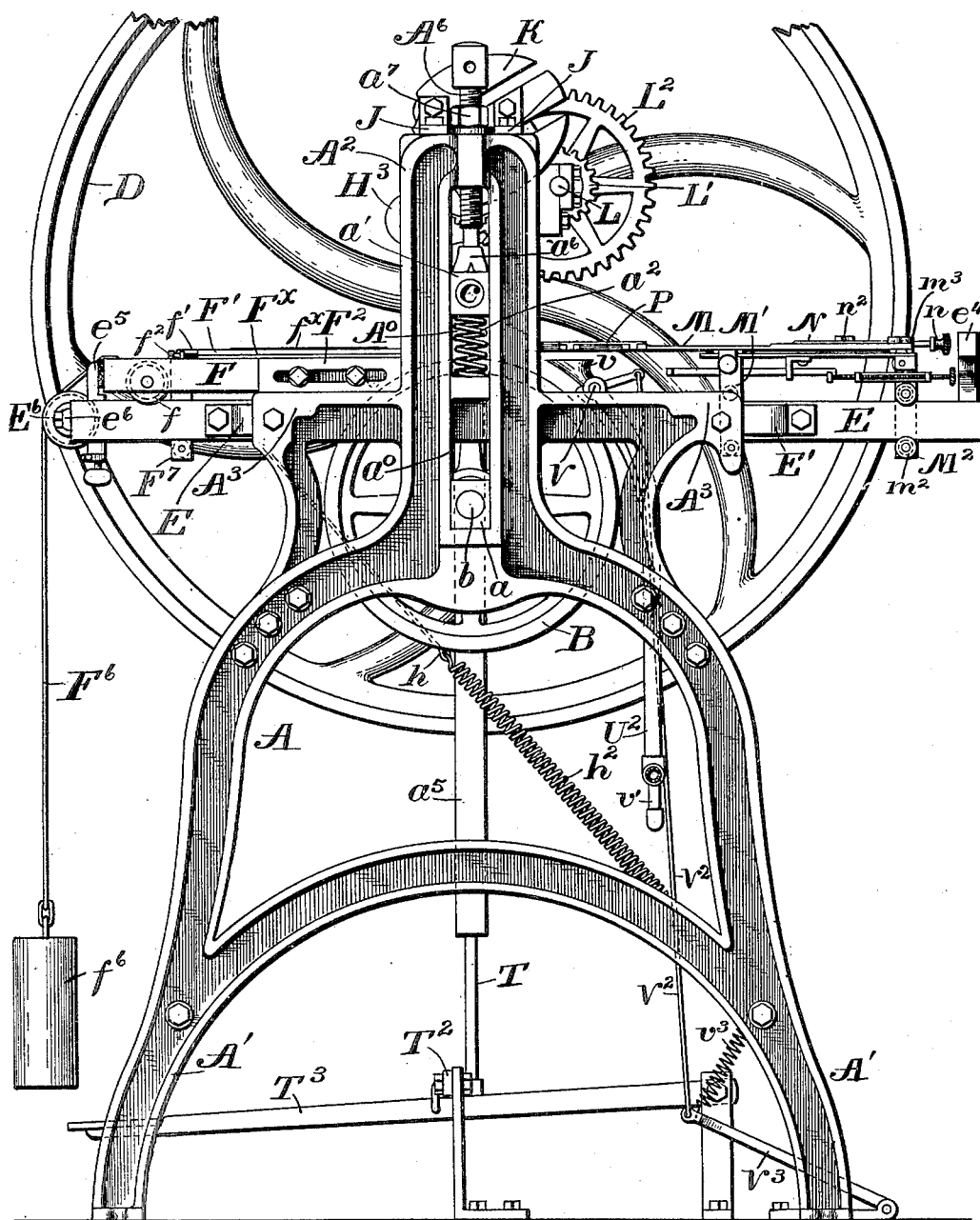


J. P. STEVENS.
PLATE PRINTING MACHINE.

(Application filed July 27, 1899.)

(No Model.)

8 Sheets—Sheet 1.



Witnesses

Rory C. Bowen.

Clarence A. Bateman

FIG. 1.

Inventor

Josiah P. Stevens,

by Wilkinson & Fisher.

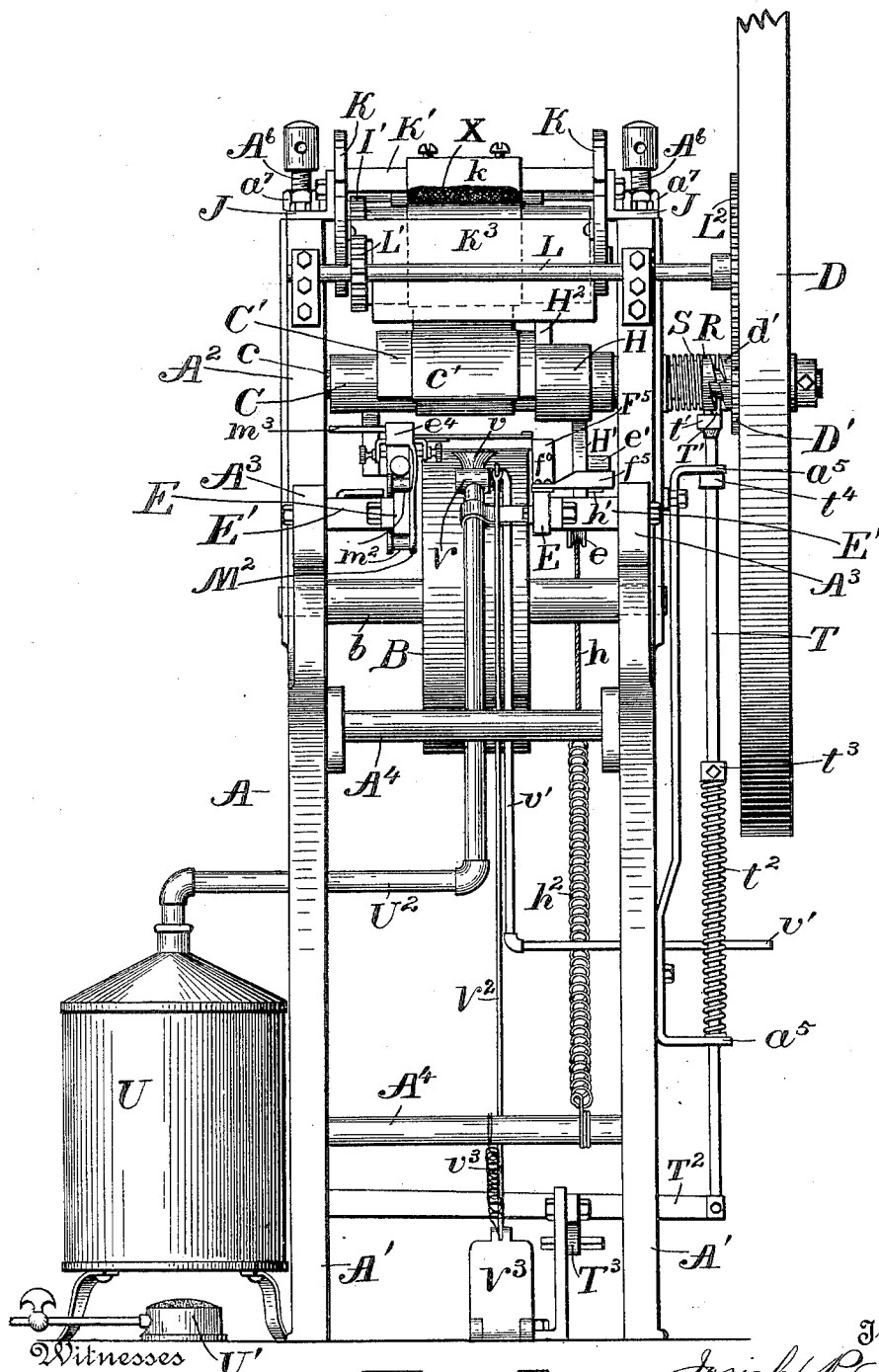
Attorneys.

J. P. STEVENS.
PLATE PRINTING MACHINE.

(Application filed July 27, 1899.)

(No Model.)

8 Sheets—Sheet 2.



Witnesses
Roy C. Bowen
Clarence A. Bateman

FIG. 2.

Inventor
Josiah P. Stevens.
by Wilkinson & Fisher.
Attorneys.

J. P. STEVENS.
PLATE PRINTING MACHINE.

(Application filed July 27, 1899.)

(No Model.)

8 Sheets—Sheet 3.

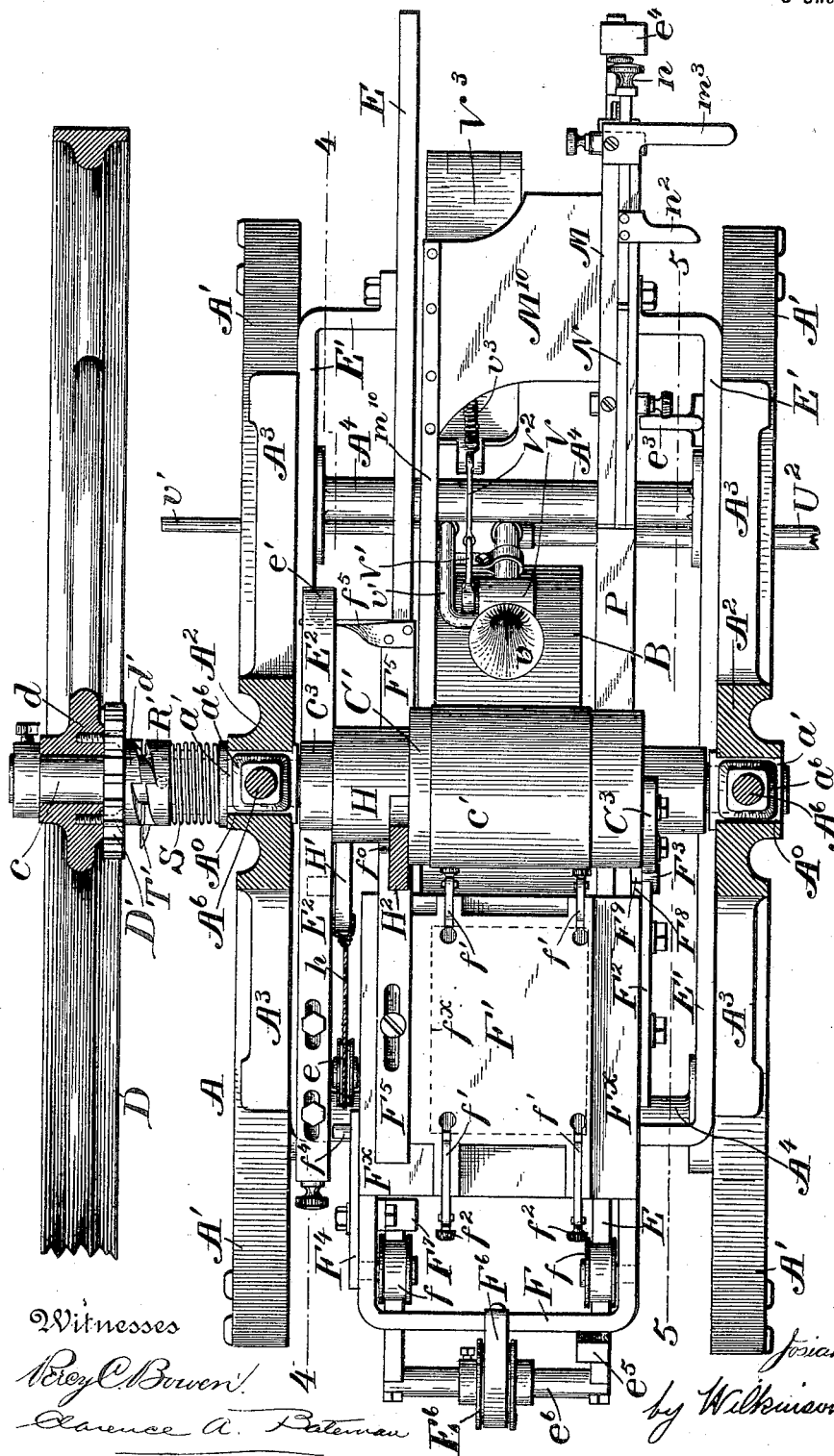


FIG. 3.

Witnesses
Rey C. Bowen
Clarence A. Pateman

Inventor
Josiah P. Stevens
by Wilkinson & Fisher
Attorneys

No. 649,773.

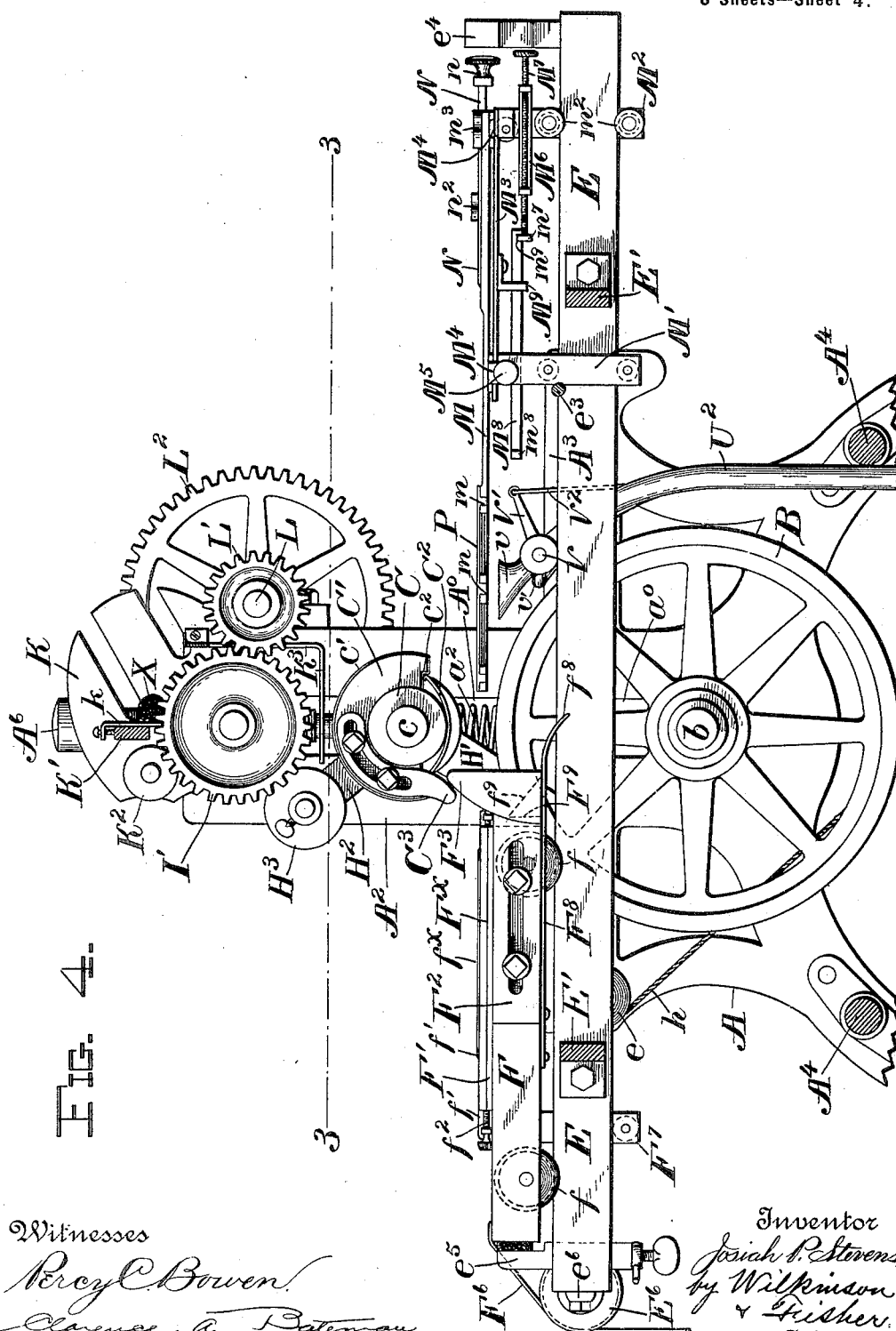
Patented May 15, 1900.

J. P. STEVENS.
PLATE PRINTING MACHINE.

(Application filed July 27, 1899.)

(No Model.)

8 Sheets—Sheet 4.



Witnesses

Percy C. Bowen.

Clarence A. Bateman

Inventor
Josiah P. Stevens,
by Wilkinson
& Fisher,
Attorneys.

No. 649,773.

Patented May 15, 1900.

J. P. STEVENS.
PLATE PRINTING MACHINE.

(Application filed July 27, 1899.)

(No Model.)

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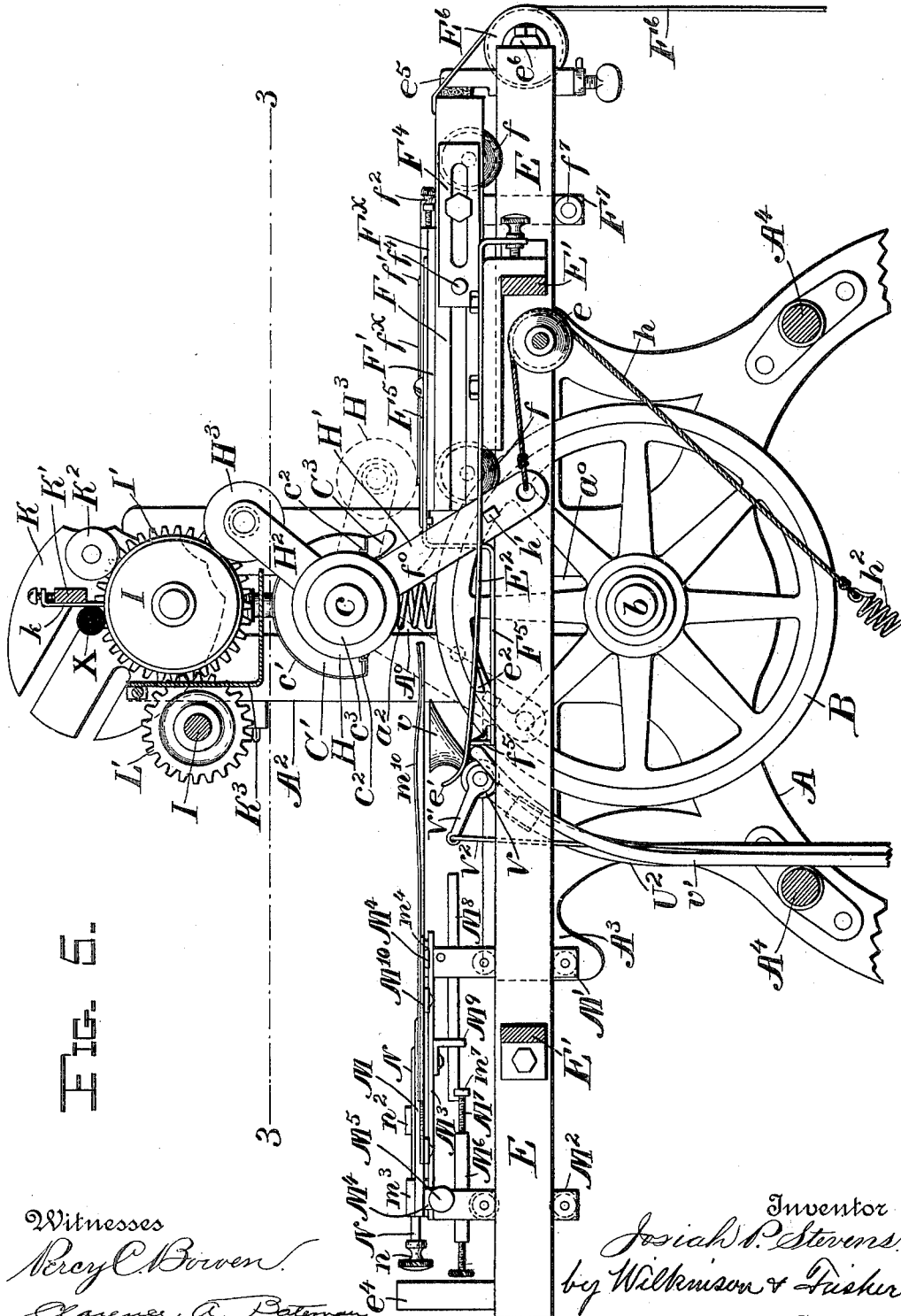


Fig. 5.

Witnesses
Nancy C. Birven
Clarence A. Pateman

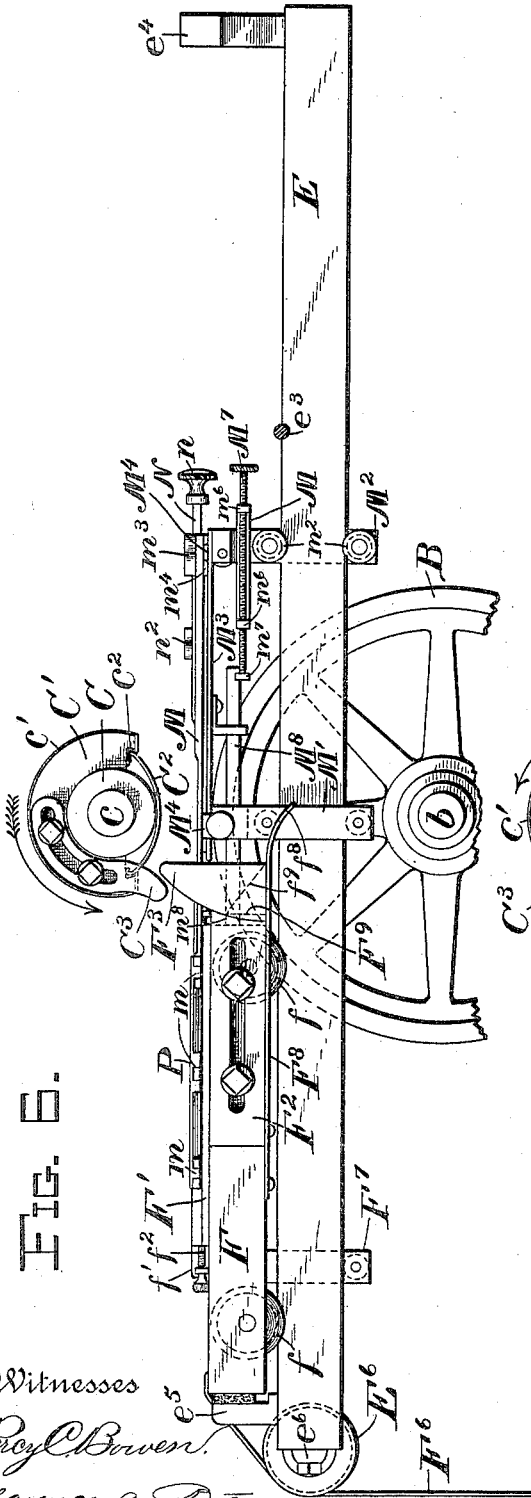
Inventor
Josiah P. Stevens
by *Wilkinson & Fisher*
Attorneys.

J. P. STEVENS.
PLATE PRINTING MACHINE.

(Application filed July 27, 1899.)

(No Model.)

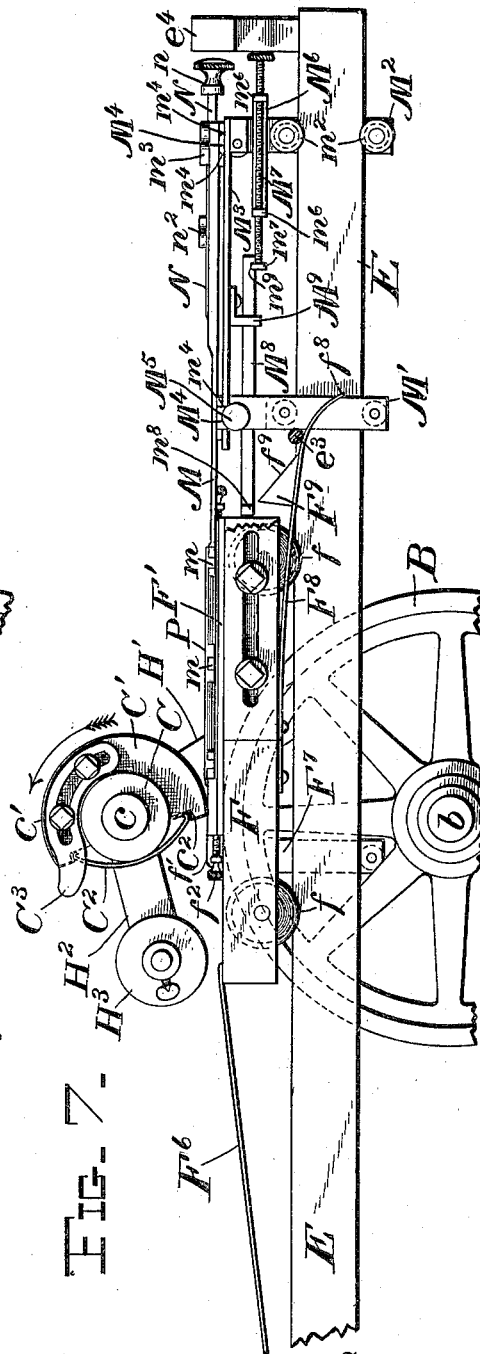
8 Sheets—Sheet 6.



Witnesses

Wm. C. Bowen.

Clarence A. Pateman



Inventor

Josiah P. Stevens.

by Wilkinson & Gusher.

Attorneys:

J. P. STEVENS.
PLATE PRINTING MACHINE.

(Application filed July 27, 1899.)

(No Model.)

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FIG. 8.

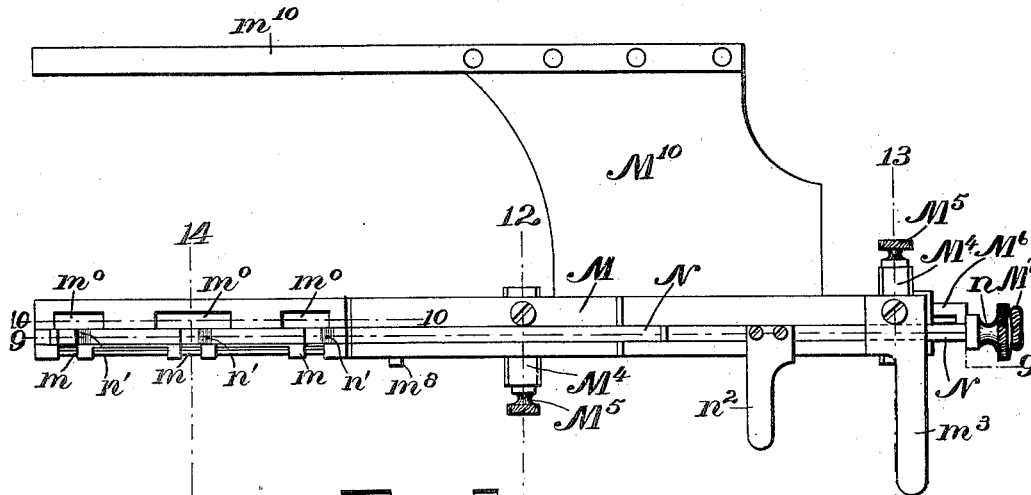


FIG. 9.

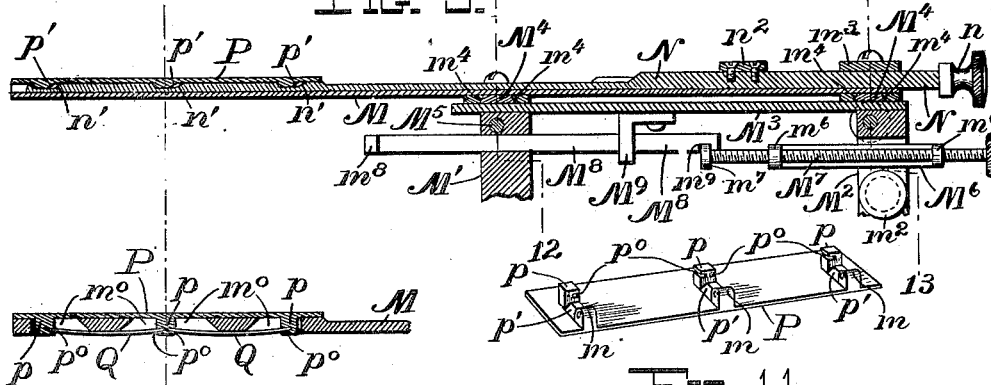


FIG. 10.

FIG. 11.

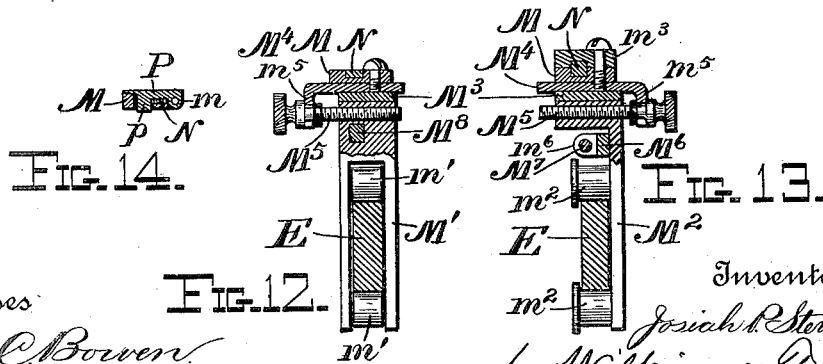


FIG. 12.

FIG. 13.

FIG. 14.

Witnesses

Percy C. Bowen
Clarence A. Bateman

Inventor

Josiah P. Stevens.
by Wilkinson & Fisher
Attorneys.

No. 649,773.

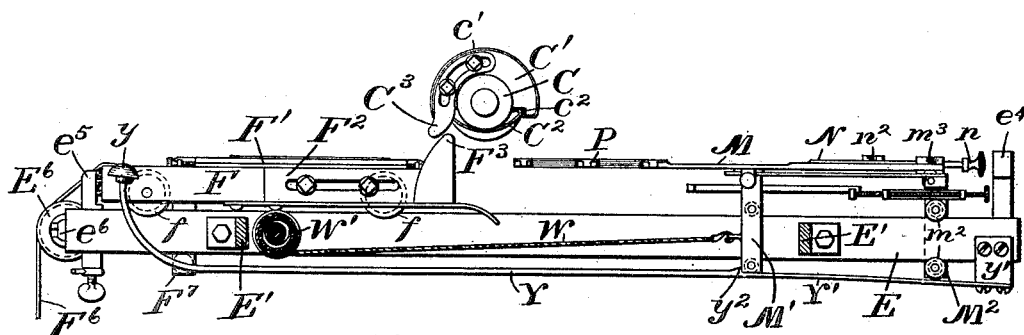
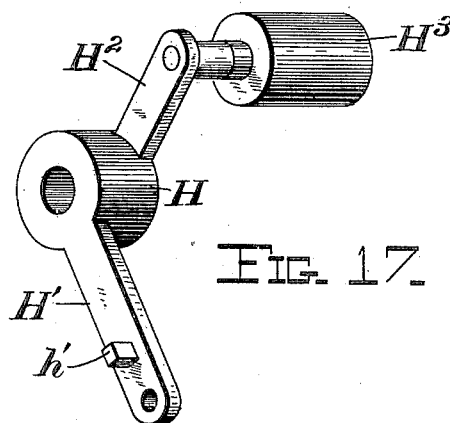
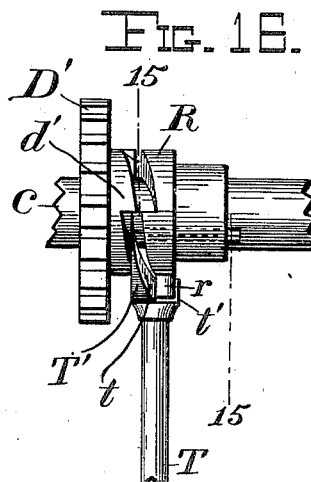
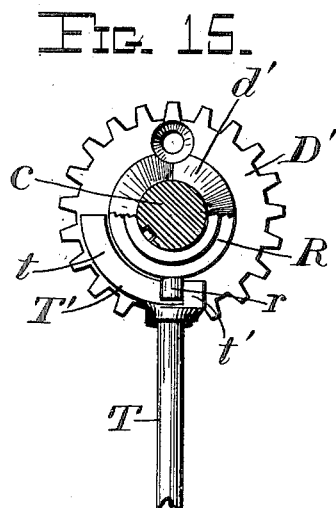
Patented May 15, 1900.

J. P. STEVENS.
PLATE PRINTING MACHINE.

(Application filed July 27, 1899.)

(No Model.)

8 Sheets—Sheet 8.



Witnesses

Roy C. Bowen
Clarence A. Pateman

Inventor

Josiah P. Stevens
by *Wilkinson & Fisher*
Attorneys.

UNITED STATES PATENT OFFICE.

JOSIAH PERCY STEVENS, OF ATLANTA, GEORGIA.

PLATE-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 649,773, dated May 15, 1900.

Application filed July 27, 1899. Serial No. 725,308. (No model.)

To all whom it may concern:

Be it known that I, JOSIAH PERCY STEVENS, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented certain new and useful Improvements in Plate-Printing Machines; 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.

My invention relates to presses or machines for printing from engraved plates, and is designed to be an improvement on my former patent, No. 616,028, granted December 13, 1898.

Reference is had to the accompanying drawings, in which the same parts are designated by the same letters of reference throughout the several views.

Figure 1 represents a side elevation of a press embodying my improvements, the upper part of the fly-wheel being broken away. Fig. 2 represents an end elevation of the same looking at the end to which the paper is fed. Fig. 3 is a horizontal section taken through the frame of the machine on the line 3 3 in Figs. 4 and 5 and through the hub of the fly-wheel, showing the bed and plate and paper-carriages in place. Fig. 4 is a view, principally in side elevation, but with one side of the frame removed, and the parts connected therewith, being cut in section along the line 4 4 in Fig. 3. Fig. 5 is a view similar to Fig. 4, but looking at the opposite side of the machine, the parts being cut in section along the line 5 5 of Fig. 3. Fig. 6 is a view in side elevation of the plate-carriage and paper-carriage locked together and in position to start between the printing-cylinders, showing the carriages and parts operating in immediate connection therewith. Fig. 7 is a view similar to Fig. 6, but showing the carriages at the moment of passing out from between the printing-cylinders after the impression has been taken and showing the plate-carriage unlocked or released from the paper-carriage ready to return to its normal position at the end of the frame. Fig. 8 represents a plan of the paper-carriage with the gripping-leaf removed therefrom. Fig. 9 represents a longitudinal section of the same, taken along the

line 9 9 in Fig. 8. Fig. 10 represents a longitudinal section through the gripping device only, taken along the line 10 10 in Fig. 8. Fig. 11 is a perspective view looking at the under side of the gripping-leaf. Fig. 12 represents a transverse section through the carriage and one of the supporting-rails for the same, taken along the line 12 12 in Figs. 8 and 9. Fig. 13 is a similar view to Fig. 12, but taken along the line 13 13 in Figs. 8 and 9. Fig. 14 represents a transverse section through the gripping end of the carriage, taken on the line 14 14 in Figs. 8, 9, and 10. Fig. 15 is a face view of the clutch and gear-wheel which connects the fly-wheel to the main axle, partly in elevation and partly in section, on the line 15 15 of Fig. 16; and Fig. 16 represents a side elevation of the same. Fig. 17 is a perspective view of the frame or oscillator for carrying the inking-roller; and Fig. 18 is a view in side elevation, showing a spring-actuated device for moving the paper-carriage toward the plate-carriage.

A designates the frame of the machine, which may be of any suitable form for supporting the several parts of the press, but which in the present instance is shown as consisting of two side frames each having the lower leg portion A', the vertical upper portion A² for supporting the rollers, and the horizontal portion A³ for supporting the carriage-track. These side frames are held rigidly together by the brace-pieces A⁴. The vertical portions A² of the side frames are slotted, as at A⁰ and a⁰, to receive the journal-boxes a a' for the shafts b and c of the impression-cylinders B and C. The shaft b of the lower cylinder B is journaled in the journal-boxes a, which rest at the bottom of the slots a⁰, so that the cylinder B is mounted to turn idly in the frame, but is rigidly held from downward movement. The main shaft c of the cylinder C is journaled in the journal-boxes a', which are free to slide vertically in the slots A⁰ and are held at the proper elevation by the springs a², upon which the said journal-boxes rest. This shaft c carries the upper impression-cylinder C between the two sides of the frame and carries at one end, outside of the frame, the wheel D, which may serve both as pulley and fly-wheel.

The impression-cylinder C has an enlarged

portion C', extending a little more than half-way around the same and situated about mid-way between the two side frames. This enlarged portion forms the impression-cylinder proper and is prepared by placing several 5 thicknesses of paper c' thereon. Beneath the edges of the enlarged portion C' of the cylinder are formed longitudinal shoulders c², and the ends of the paper c' are placed over the 10 said shoulders and held in place by a spring-plate C², which is sprung in against the said shoulders, as shown in Figs. 6 and 7, thus binding the ends of the paper and holding it secure. The impression-cylinder C is held 15 down to its work by screws A⁶, swiveled in feet a⁶, which rest upon the journal-boxes a', the said screws passing through the upper threaded portion of the side frames A and having lock-nuts a⁷ for holding the said screws 20 at the proper adjustment.

The rails E, which form the carriage-track, are supported by the inwardly-turned ends of brackets E', which are secured to the horizontal portions A³ of the side pieces of the 25 frame.

The plate-carriage consists of a U-shaped frame F, having secured thereto a bed-plate F', which is provided with sliding clamps f', operated by the screws f², for holding the 30 engraved plate f^x upon the bed-plate. The sides of the bed-plate F are reduced in thickness, as at F^x, to allow room for the paper-carriage on one side of the plate and for the follower F⁵ on the other side. Flanged rollers f are mounted in the U-shaped frame F 35 and travel upon the rails E, thus supporting the plate-carriage and allowing it to run freely along the said track. On one side of the carriage is adjustably secured a piece F², having at its inner end a finger F³, extending upward 40 in position to be engaged by a finger C³, adjustably secured to the end of the enlarged portion of the impression-cylinder. When the latter is rotated in the direction of the arrow in Fig. 6, the finger C³ will engage the 45 finger F³ and draw the plate-carriage along the track until the bed-plate F' passes between the two cylinders B and C and is caught thereby, the continued rotation of the cylinder C carrying the bed-plate through between 50 the two cylinders.

At the end of the cylinder C opposite to the finger C³ is mounted on the shaft c the inking-roller frame or oscillator, consisting of a 55 hub H, having a downwardly-projecting lever-arm H' and an upwardly-projecting arm H², carrying the inking-roller H³, which may be mounted thereon in any suitable manner. The hub H is loosely mounted upon the shaft c and held from longitudinal movement thereon at one side by the end of the enlarged portion C' of the cylinder C and at the other end 60 by a collar c³, secured upon the shaft c. The arms H' and H² project from the hub H at an obtuse angle of approximately one hundred and five or one hundred and ten degrees, and the arm H' projects downwardly by the side

of the plate-carriage and has secured to the lower end thereof a cord h, which passes over a sheave e, mounted between the rail E and 70 the bracket E', and the said cord is secured to a coiled spring h², which latter is secured to one of the brace-pieces A⁴ of the frame. The tendency of this spring and connection is to hold the inking-roller normally in its 75 raised position against the ink-distributing roller I, which will be hereinafter described, as shown in Figs. 4 and 5.

Adjustably secured to the side of the carriage F is a piece F⁴, having a pin f⁴, which 80 projects outward in position to engage the arm H' as the plate-carriage moves under the impression-cylinder, and thus turn the hub H, bringing the arm H² and inking-roller H³ downward in position to ink the plate, as 85 shown in dotted lines in Fig. 5. The arm H' has a lug h' projecting outwardly from one side beneath a spring E², which latter is adjustably secured to the bracket E' and has a catch e² secured to the lower side thereof, 90 which is arranged to engage the lug h' and hold the arm H' when the plate-carriage has passed beneath the impression-cylinder, so that the inking-roller will remain in its lower position as the plate-carriage is returned to 95 its initial position, thus causing the plate to pass under the inking-roller on its return movement.

Adjustably secured to the bed-plate F' is a follower-strip F⁵, which extends beyond the 100 inner end of the plate-carriage and is bent downwardly, as at f⁰, so that its inner end rests lightly upon one of the rails E. The follower F⁵ is secured to the inner end of the follower-strip F⁵ and extends outwardly in 105 position to pass under the upwardly-turned end e' of spring E² and so raise the said spring, releasing the lug h', when the plate-carriage is returned to its initial position at the end of the track, as shown in Fig. 5. The 110 plate-carriage is returned to its initial position by means of a strap F⁶, secured to the said carriage and passing over a sheave E⁶, mounted on a shaft e⁶, secured to the ends of the rails E and having at its lower end a 115 weight f⁶. A cushioned buffer or stop e⁵ is adjustably secured to one of the rails E to stop the said plate-carriage at the proper position.

As a safeguard to prevent the plate from 120 jumping from the track a piece F⁷ is secured to one side of the said carriage and extends below one of the rails E', where it is provided with a roller f⁷, projecting under the said rail E, which prevents the plate-carriage from being 125 lifted from the track.

The ink-distributing device consists of a distributing-roller I, journaled in the side pieces K, which are secured by brackets J to the upper ends of the vertical parts A² of the 130 side frames A, and these pieces K are arranged to extend downwardly a short distance just inside of the said side frames. A gear-wheel I' is secured to one end of the roller I

and meshes with a smaller gear-wheel L' on a shaft L , journaled in suitable bearings on the side frames A and having at its opposite end a gear-wheel L^2 , meshing with a gear-wheel D' on the hub d of the fly-wheel D . Thus the rotation of the fly-wheel D will be imparted through the shaft L and gearing to the ink-distributing roller I , the gearing being arranged to turn the roller much slower than the fly-wheel. Extending across the machine, above the roller I , is a piece K' , secured at its ends to the side pieces K and having a scraper k adjustably secured thereto. This scraper k is adjusted to lightly touch the distributing-roller I and spread the ink smoothly thereon. The ink used is in the form of a paste of the proper consistency to form a ball or roll X , which is placed upon the roller I , the rotation of which keeps the ink rolling against the scraper k , which scrapes the surplus ink from the roller, but allows a small portion of ink, which sticks to the roller, to pass, thus keeping the roller covered with a thin coating of ink. K^2 designates a distributing-roller also, which may be arranged to have a slight longitudinal vibratory movement (as is well known in the art) to more evenly spread the ink upon the distributing-roller I . The inking-roller II^3 , previously described, rests normally against the distributing-roller I and takes ink therefrom, as shown in Fig. 5. A shield K^3 is secured to the end pieces K and extends on one side of and below the distributing-roller I and is for the purpose of catching any pieces or drops of ink which may fall or be thrown from the said distributing-roller.

The paper-carriage consists of a bar M , supported upon the uprights M' and M^2 and having a longitudinal groove in which is arranged to slide a rod or "projector" N . Hinged to one side of the bar M , as at m , at its forward end is a gripping-leaf P , having lugs p , which extend through openings m^0 in the bar M and have transverse grooves p^0 cut in them, as shown in Fig. 11. This gripping-leaf P is also provided with smaller lugs having inclined or beveled edges p' , which extend into notches having beveled edges n' in the forward end of the projector N , which beveled edges n' engage the beveled edges p' on the said gripping-leaf, as seen most clearly in Fig. 9. The rod or projector N is provided with a knob n and a finger-piece n^2 , by means of which the said projector may be moved longitudinally. It will be seen that when the projector is pushed forward in its groove the inclined edges of the notches n' , acting upon the inclined edges p , will force the gripping-leaf upward away from the bar M , thus opening the gripping device. Springs Q are arranged in shallow recesses below the bar M , with their ends held in the grooves p^0 , as shown in Fig. 10. The tendency of these springs is to hold the gripping-leaf down closely upon the bar M . Thus it will be seen that when the projector N is pushed forwardly the inclined

edges n' in the notches thereof acting upon the inclined edges p' will raise or open the gripping-leaf for the insertion or removal of a sheet of paper or card, and the backward movement of the said projector will allow the beveled edges p' to sink into the said notches and allow the springs Q to close the gripping-leaf down upon the bar M to hold the paper or card firmly. A handpiece m^3 is secured upon the rear end of the bar M over the projector N and serves to retain the said rod in the groove, as well as a rest for the hand in operating the paper-carriage. The uprights M' and M^2 are secured at their tops to a brace-piece M^3 , which serves to connect them rigidly together. The upright M' is arranged to straddle one of the rails E and is provided with a pair of rollers m' , one above and one below the said rail, and the upright M^2 passes down inside of the same rail E and is provided with a pair of rollers m^2 , one above and one below the said rail, and having flanges on their outer sides extending over the edges of the said rail, thus allowing the said upright M^2 to pass the bracket E' , where it is connected to the rail. The uprights M' and M^2 , with the brace-piece M^3 , form an inverted-U-shaped frame, which can travel easily along the rail E on the rollers m' and m^2 .

At the top of each of the uprights M' and M^2 , above the brace M^3 , are formed dovetail guideways m^4 for the transverse pieces M^4 , to which the bar M is secured. These pieces are bent downwardly at one end, as at m^5 , and bifurcated to straddle the screws M^5 , as shown in Figs. 12 and 13, so that by turning the said screws M^5 the paper-carriage may be adjusted laterally with relation to the plate-carriage. A bracket M^6 , having tapped lugs m^6 at each end, is secured to the upright M^2 and carries a thumb-screw M^7 , having a flange m^7 on its inner end. A bar M^8 is arranged to slide through the uprights M' and any other suitable guide, as M^9 , the said bar having a notch m^9 to engage the flange m^7 on the screw M^7 , by means of which the bar M^8 may be adjusted longitudinally. The inner end of the bar M^8 is bent laterally at right angles to the body thereof, forming a hook m^8 to engage a spring-catch on the plate-carriage, and thus lock the two carriages together at the time the impression is being taken. A sheet of metal M^{10} is secured in any suitable manner to the bar M and extends across the machine, having secured to its opposite edge a spring-strip m^{10} to support the free edge of the paper. This strip m^{10} is bent slightly near its forward end; as shown in Fig. 5, to slightly raise the paper from the plate after the impression has been taken. A flat spring F^8 is secured to the lower side of the plate-carriage on the same side of the machine as the hook m^8 on the paper-carriage and in line therewith, the said spring having its free end bent downwardly, as at f^8 , and having an upwardly-projecting catch F^9 with an inclined edge f^9 near the inner

end of the plate-carriage. When the paper-carriage is pressed up against the plate-carriage, the hook m^8 on the bar M^8 will ride up the inclined edge f^9 on the catch F^9 , forcing the spring F^8 downwardly until the hook passes over the top of the catch, when the spring F^8 will raise the catch F^9 , holding the hook and locking the paper-carriage to the plate-carriage, as shown in Fig. 6. When the plate-carriage has passed between the impression-cylinders and is just about to be released therefrom, the downwardly-bent end f^8 of the spring F^8 will pass beneath a stud or pin e^8 , projecting inwardly from one of the brackets E' (this pin being shown more clearly in Fig. 3) and be forced downwardly thereby, bringing the catch F^9 with it and releasing the hook m^8 , as shown in Fig. 7.

The fly-wheel D, which serves also as a pulley, is mounted to turn freely upon the shaft c , but has a toothed wheel D' rigidly secured to its hub d , which imparts motion to the ink-distributing mechanism, as heretofore described. A clutch member d' is formed on or secured to the hub of the toothed wheel D' , the other member R of the clutch being keyed to slide upon the shaft c , but not to rotate thereon. A spring S is coiled around the shaft c between the clutch member R and the side of the frame A and tends to press the said clutch member R into engagement with the clutch member d' on the gear-wheel D' . A vertical rod T is arranged to slide in bearings a^5 in the side of the frame A and carries at its upper end a segment T' , arranged to engage a stud r , projecting from the clutch member R. The segment T' is formed with an inclined side t and an offset or lug t' , the inclined side holding the stud r to prevent the clutch member R from engaging with the clutch member d' and the lug t' holding the said stud to prevent the member R and the shaft c from rotating. The lower end of the rod T is connected with an arm T^2 , pivoted beneath the machine and connected with a treadle T^3 . A spring t^2 is coiled around the rod T and bears at one end against one of the bearings a^5 and at the other end against a collar t^3 , secured to the rod T. The tendency of the spring t^2 is to keep the rod T raised and the segment T' in engagement with the stud r on the clutch member R. The upward movement of the rod T is limited by a collar t on the said rod, which strikes one of the bearings a^5 .

When it is desired to start the impression-cylinders, the attendant will press upon the treadle, thus pulling the rod T downwardly until the stud r is released from the segment T' , when the spring S will throw the clutch member R into engagement with the clutch member d' , which is revolving continuously with the wheel D, thus imparting motion to the shaft c and the parts carried thereby. As soon as the impression-cylinder C has started the attendant releases the treadle T^3 and the

spring t^2 returns the rod T and segment T' to their normal positions. As the clutch rotates, the stud r will ride up the inclined surface t on the said segment, thus withdrawing the clutch member R from the clutch member d' and finally bringing up against the lug t' , stopping the shaft c from further rotation. Thus it will be seen that one pressure upon the treadle will produce just one complete revolution of the shaft c and impression-cylinder C.

U designates a steam-boiler of any suitable type, which may be heated by a gas-burner, as shown at U' , or in any other convenient manner. A steam-pipe U^2 leads from the said boiler to a valve V, situated just below the place occupied by the sheet of paper when first placed in the paper-carriage. The said valve V has a flaring mouth v , opening upward, and an escape-pipe v' , which passes downward and out through the frame of the machine opening into the air. The valve-lever V' is connected by a rod V^2 with a treadle V^3 , pivoted or hinged below the machine and held normally in a raised position by a spring v^3 . When the said treadle is in its raised position, the valve V will be open to the escape-pipe v' ; but when the treadle is pressed down the valve will be opened to the mouth v and closed to the escape-pipe v' , thus delivering a puff of steam to the under side of the paper to moisten the same.

In Fig. 18 of the drawings is shown a device in which the paper-carriage is moved forward by a spring. For this purpose a cord W is connected to the paper-carriage and wound upon a spring-actuated drum W' , which is mounted between one of the rails E and the bracket E' . The tendency of the spring in the drum W' is to wind the cord W thereon, and thus draw the paper-carriage to the plate-carriage, where it is locked, as heretofore described. Y designates a rod having one end flattened, as at Y' , to form a spring the end of which is secured to a block y' , secured to the end of one of the rails E. At the other end of the spring portion is formed a catch y^2 to engage the upright M' and hold the paper-carriage in the position for feeding, as shown in Fig. 18. The rod Y extends nearly to the other end of the machine, where it is bent upwardly and provided with a knob y , which may be pressed downwardly by the attendant at the proper time to release the paper-carriage and allow it to run quickly to the plate-carriage, to which it is locked, as heretofore described. As the plate-carriage advances between the impression-cylinders it pushes the paper-carriage back to its initial position, where it is held by the catch y^2 . This device may be used to advantage when cards are being fed to the machine.

The operation of the machine is as follows: The engraved plate having been properly clamped upon the base-plate F' , motion is imparted to the wheel D from any suitable

source of power. The attendant who wipes the ink from the plate stands at the end of the press where the plate-carriage normally remains, and the attendant who feeds the paper or cards stands at the opposite end, where the paper-carriage normally remains. Thus the two attendants are entirely out of each other's way and cannot interfere with each other. While one attendant is wiping the ink from the plate, the other attendant or "feeder" is placing the paper or card beneath the gripping-leaf of the paper-carriage with one hand, while with the other hand she pulls upon the finger-piece n^3 , sliding the projector N, causing the inclined surfaces n' to move from under the inclined surfaces p' of the gripping-leaf, and allowing the spring Q to pull the said leaf down upon the paper, holding it firmly in the carriage. While the paper is being gripped in the carriage the feeder presses one foot upon the treadle V^3 , causing the valve V to open and deliver a puff of steam against the under side of the paper, thus moistening it slightly. As soon as the plate is wiped the feeder pushes the paper-carriage against the plate-carriage, thus carrying the paper or card over the plate, the adjustment being such that the paper or card will be carried to precisely the proper position above the plate when the paper-carriage is locked to the plate-carriage. As soon as the two carriages are locked together the attendant who wipes the plate presses upon the treadle T^3 , thus releasing the clutch member R, which by the pressure of the spring S springs into engagement with the clutch member d' , turning with the wheel D, and causes the shaft c and impression-cylinder C to make one revolution, as heretofore described. The first movement of the shaft c will bring the finger C^3 into engagement with the finger F^3 and start the plate-carriage toward the impression-cylinders. When the bed-plate F' of the plate-carriage passes between the impression-cylinders B and C, the pressure of these cylinders as they revolve will carry the plate-carriage along the bed-plate, engraved plate, and paper, passing between the impression-cylinders, where the impression is taken. As the plate-carriage leaves the impression-cylinders the downwardly-curved end f^3 of the spring F^3 passes beneath the pin e^3 and unlocks the paper-carriage, and as soon as the cylinder C leaves the plate-carriage the latter is returned to its initial position by the band F^6 and weight f^6 . As the plate-carriage is carried beneath the impression-cylinder the stud f^4 thereon engages the lever-arm H' , turning the hub H and bringing the arms and the inking-roller to the positions shown in dotted lines in Fig. 5—that is, the inking-roller in position to ink the plate as the carriage is returned to its initial position. These parts are held in this position while the carriage is being returned by the lug h' being engaged by the catch e^3 and are released by

the follower f^5 when the carriage has reached the end of its return movement, the cord h and spring h^2 bringing the inking-roller H^3 up against the ink-distributing roller for a fresh supply of ink, as heretofore described. As soon as the paper-carriage is released from the plate-carriage the feeder pulls the former back until the knob n strikes the stop e^4 on the end of the rail E, thus pushing the projector N forward in the groove in the bar M and forcing the inclined edges n' beneath the inclined edges p' , thus raising the gripping-leaf and releasing the printed paper, which is removed by hand and another sheet inserted while the plate is being wiped by the attendant at the other end of the press ready for the next impression, the same operations being performed for each impression.

By use of a machine such as disclosed in the foregoing it will be seen that the wiping of the plate and the feeding of the paper are both accomplished at the same time and from opposite ends of the press, and the paper-carriage is so adjusted that when it is thrown forward the paper will be instantly placed in precisely the right position for printing, thus saving a great deal of time in these operations. There are many other advantages which will readily be seen by those skilled in the art to which this invention appertains, such as the facility with which the engraved plates can be fixed to the bed-plate and the manner of inking the plate without waste of time.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a plate-printing machine, a track, a plate-carriage mounted to run thereon, screw-clamps for securing the plate to the said carriage, impression-cylinders above and below the path of the said carriage, means for moving the said carriage between the said impression-cylinders, a paper-carriage also adapted to run on the said track, means for gripping the paper on the said carriage, means for delivering a puff of steam to the said paper and means for locking the paper-carriage to the plate-carriage, substantially as described.

2. In a plate-printing machine, an impression-cylinder, having an enlarged central portion extending approximately half-way around the said cylinder, longitudinal shoulders at the ends of the enlarged central portion over which shoulders the ends of the backing-paper are adapted to be placed and a spring adapted to be placed between the two shoulders to hold the said backing-paper, substantially as described.

3. In a plate-printing machine, the combination with an impression-cylinder, having an enlarged central portion extending approximately half-way around the said cylinder, longitudinal shoulders at the ends of the enlarged central portion, over which shoulders the ends of the backing-paper are adapted

to be placed, and a spring adapted to be placed between the two shoulders to hold the said backing-paper, of a second impression-cylinder, a plate-carriage, and means for moving the said plate-carriage between the two impression-cylinders, substantially as described.

4. In a plate-printing machine, the combination with a track, a plate-carriage mounted to run thereon, an impression-cylinder mounted above the path of the said plate-carriage, and means for moving the said plate under the impression-cylinder, of an oscillator mounted upon the shaft of the said impression-cylinder, and an inking-roller carried by the said oscillator, means carried by the plate-carriage for turning the oscillator on the forward movement of the carriage, to bring the inking-roller in the path of the said carriage, means for holding the inking-roller upon the carriage during its return movement, and means for releasing the oscillator and raising the roller at the end of the return movement of the carriage, substantially as described.

5. In a plate-printing machine, the combination with a movable plate-carriage, an impression-cylinder mounted above said plate-carriage, an ink-distributing device mounted above the said impression-cylinder, and means for moving the said plate-carriage beneath the said impression-cylinder, and returning it to its original position; of an oscillator mounted on the shaft of the impression-cylinder, and an inking-roller carried by the said oscillator, a spring for holding the said inking-roller against the ink-distributing device, means carried by the carriage for bringing the said inking-roller into the path of the said carriage after it has passed the inking-roller on its forward movement, a spring-catch for holding the said inking-roller down upon the plate as the plate-carriage is returned to its initial position; and means carried by the carriage for releasing the said catch and allowing the inking-roller to return at the end of the return movement of the carriage, substantially as described.

6. In a plate-printing machine, the combination with a track, a plate-carriage mounted to run on the said track, impression-cylinders above and below the path of the said plate-carriage, and means for moving the said plate-carriage between the said impression-cylinders; of a paper-carriage also mounted to run on the said track and consisting of a frame, a bar laterally adjustable on the said frame, a gripping-leaf hinged to the end of the said bar and having beveled lugs, springs for holding the gripping-leaf down upon the said bar, a projector arranged to slide longitudinally in the said bar and having beveled depressions to receive the said beveled lugs on the gripping-leaf, whereby when the projector is pushed forward the gripping-leaf will be raised, and means for locking the paper-carriage to the plate-carriage, substantially as described.

7. In a plate-printing machine, the combination with a track, a plate-carriage mounted to run on the said track, impression-cylinders above and below the path of the said plate-carriage, and means for moving the said plate-carriage between the said impression-cylinders; of a paper-carriage also mounted to run on the said track and consisting of a frame, a bar laterally adjustable on the said frame, a gripping-leaf hinged to the end of the said bar and having beveled lugs, springs for holding the gripping-leaf down upon the said bar, a projector arranged to slide longitudinally in the said bar and having beveled depressions to receive the said beveled lugs on the gripping-leaf, whereby when the projector is pushed forward, the gripping-leaf will be raised, a hook adjustable on the said paper-carriage, and a catch on the plate-carriage to engage the said hook and lock the two carriages together, substantially as described.

8. In a plate-printing machine, the combination with a track, a plate-carriage mounted to run on the said track, impression-cylinders above and below the path of the said plate-carriage, and means for moving the said plate-carriage between the said impression-cylinders; of a paper-carriage also mounted to run on the said track and consisting of a frame, a bar laterally adjustable on the said frame, a gripping-leaf hinged to the end of the said bar and having beveled lugs, a projector arranged to slide longitudinally in the said bar and having beveled depressions to receive the said beveled lugs on the gripping-leaf, whereby when the projector is pushed forward the gripping-leaf will be raised, a hook adjustable on the said paper-carriage, a catch on the said plate-carriage to engage the said hook and lock the two carriages together, and means for disengaging the said catch at the proper time, substantially as described.

9. In a plate-printing machine, a paper-carriage consisting of a frame, a longitudinal bar transversely adjustable on the said frame, a gripping-leaf hinged to the said bar and having beveled lugs, springs holding the said gripping-leaf upon the said bar, a projector arranged to slide in the said bar and having depressions with beveled edges to receive the said beveled lugs, whereby when the projector is pushed forward the gripping-leaf will be opened, substantially as described.

10. In a plate-printing machine, the combination of a track, a plate-carriage mounted to run on the said track, a spring-catch on the said plate-carriage, and means for moving the plate-carriage between the impression-cylinders, and returning it to its initial position, of a paper-carriage also mounted to run on the said track, and consisting of a frame, a bar transversely adjustable on the said frame, a gripping-leaf hinged to the end of the said bar, springs for holding the said gripping-leaf closely upon the said bar, a projector arranged to slide in the said bar and raise the

said gripping-leaf, a hook adjustable in the said frame and adapted to engage the spring-catch on the plate-carriage and thus lock the two carriages together, and means for unlocking the paper-carriage, as the plate-carriage reaches the end of its forward movement, substantially as described.

11. In a plate-printing machine, a track, a plate-carriage mounted to run on the said track, a paper-carriage also mounted to run on the said track, means for drawing the paper-carriage to the plate-carriage, and means for holding the paper-carriage in its initial position and for releasing it at the proper time, substantially as described.

12. In a plate-printing machine, the combination with a track, a plate-carriage mounted to run thereon, means for compressing the said plate-carriage, of a paper-carriage also mounted to run on the said track, a steam-pipe from any suitable steam-boiler, a valve connected with the said steam-pipe and situated beneath the paper when on the said carriage, and means for opening the said valve to deliver a puff of steam to the said paper, substantially as described.

13. In a plate-printing machine, a track, a paper-carriage mounted to run thereon, means for gripping one edge of the paper on the said carriage, and a spring for supporting the free edge of the paper, substantially as described.

14. In a plate-printing machine, a track, a carriage mounted to run on the said track, a bar adjustable on the said carriage, means for gripping one edge of the paper on the said bar, a sheet of metal extending from the said bar across the said track, and a flat spring secured to the edge of the said sheet of metal to support the free edge of the paper, substantially as described.

15. In a plate-printing machine, a track, a plate-carriage mounted to run thereon, grooves in the top of the said carriage, clamps arranged to slide in the said grooves and having their inner ends projecting above the surface of the said plate-carriage to secure a plate thereto; and their outer ends bent downwardly, screws threaded in the said plate-carriage and having their heads formed to engage the downwardly-bent ends of the said clamps, impression-cylinders above and below the said carriage, a paper-carriage also adapted to run on the said track, and means for holding the paper in the said paper-carriage and means for locking the two carriages together, substantially as described.

16. In a plate-printing machine, a paper-carriage consisting of a frame, transverse guideways in the said frame, pieces arranged to slide in the said guideways and connected with adjusting-screws, a bar secured to the said pieces, a gripping-leaf hinged to the said bar, and having inclined lugs thereon, a projector arranged to slide in the said bar, and having inclined surfaces to engage the lugs on the said gripping-leaf, and raise the latter

when the bar is pushed forward and springs to hold the gripping-leaf down, substantially as described.

17. In a plate-printing machine, a paper-carriage, consisting of a frame, a bar adjustable on the said frame, and having slots through the forward end thereof, a gripping-leaf hinged to the said bar and having lugs adapted to pass through the said slots, springs connected with the said lugs below the said bar to hold the said gripping-leaf down upon the bar, and means for raising the said gripping-leaf, substantially as described.

18. In a plate-printing machine, a paper-carriage consisting of a frame, a bar transversely adjustable on the said frame, and having a longitudinal slot throughout its length and other slots near one end thereof, a gripping-leaf hinged to the said bar and having lugs projecting through the said slots thereof and inclined lugs projecting into the longitudinal slot thereof, springs connected with the said lugs on the gripping-leaf to hold the said leaf down upon the said bar, and a projector arranged to slide in the longitudinal groove and having inclined edges to engage the inclined lugs on the gripping-leaf and raise the latter, substantially as described.

19. In a plate-printing machine, the combination with a track, a paper-carriage consisting of a frame having uprights, rollers in the said uprights to travel on the said track, a bar adjustably secured to the said frame, a gripping-leaf hinged to the end of the said bar, springs for holding the said gripping-leaf down upon the said bar, and means for raising the said gripping-leaf, a bracket secured to one of the said uprights, a screw passing through the said bracket, a bar arranged to slide through the other upright, and connected with the said screw, and a hook on the end of the said bar, of a plate-carriage arranged to run on the said track, and a spring-catch on the said plate-carriage to engage the said hook on the paper-carriage, substantially as described.

20. In a plate-printing machine, the combination of a track, a plate-carriage mounted to run on the said track, of a paper-carriage also mounted to run on the said track, a spring-actuated drum, a cord wound on the said drum and connected with the said paper-carriage to draw the latter toward the said plate-carriage, and means for holding the paper-carriage in its initial position and for releasing it at the proper time, substantially as described.

21. In a plate-printing machine, the combination of a track, a plate-carriage mounted to run on the said track, of a paper-carriage also mounted to run on the said track, a spring-actuated drum, a cord wound on the said drum and connected with the said paper-carriage to draw the latter toward the said plate-carriage, and a spring-rod secured to the frame of the machine, a catch on the said rod to hold the paper-carriage in its initial

position, and means for disengaging the said catch at the proper time, substantially as described.

22. In a plate-printing machine, the combination with a track, a plate-carriage mounted to run thereon, means for compressing the said plate-carriage, of a paper-carriage also mounted to run on the said track, a steam-pipe having a flaring mouth situated beneath the paper when on the carriage, a three-way valve in the said steam-pipe, an escape-pipe connected with the said three-way valve and means for closing the valve to the escape-pipe and for opening it to the flaring mouth to deliver a puff of steam to the said paper, substantially as described.

23. In a plate-printing machine, the combination with a track, a plate-carriage mounted to run thereon, an impression-cylinder mounted above the said plate-carriage, an oscillator mounted upon the shaft of the impression-cylinder and carrying an inking-roller, of an ink-distributing roller, means for turning the said ink-distributing roller, a scraper mounted above the said ink-distributing roller to spread the ink thereon, and means for turning the said oscillator to bring the inking-roller down upon the plate-car-

riage and also to raise the said inking-roller against the said ink-distributing roller, substantially as described.

24. In a plate-printing machine, an ink-distributing roller, a scraper mounted above the said ink-distributing roller, to spread the ink thereon, and means for turning the said ink-distributing roller continuously; of an impression-cylinder, a plate-carriage mounted to run beneath the said impression-cylinder, an oscillator mounted on the shaft of the said impression-cylinder, and having two arms, an inking-roller mounted on one of the said arms, a stud on the said plate-carriage to engage the other arm on the oscillator and turn the latter, a catch for holding the said oscillator, means carried by the said plate-carriage for releasing the said oscillator from the said catch, and means for turning the said oscillator to bring the inking-roller against the ink-distributing roller, substantially as described.

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

JOSIAH PERCY STEVENS.

Witnesses:

JAS. B. GANTT,

H. V. JONES.