

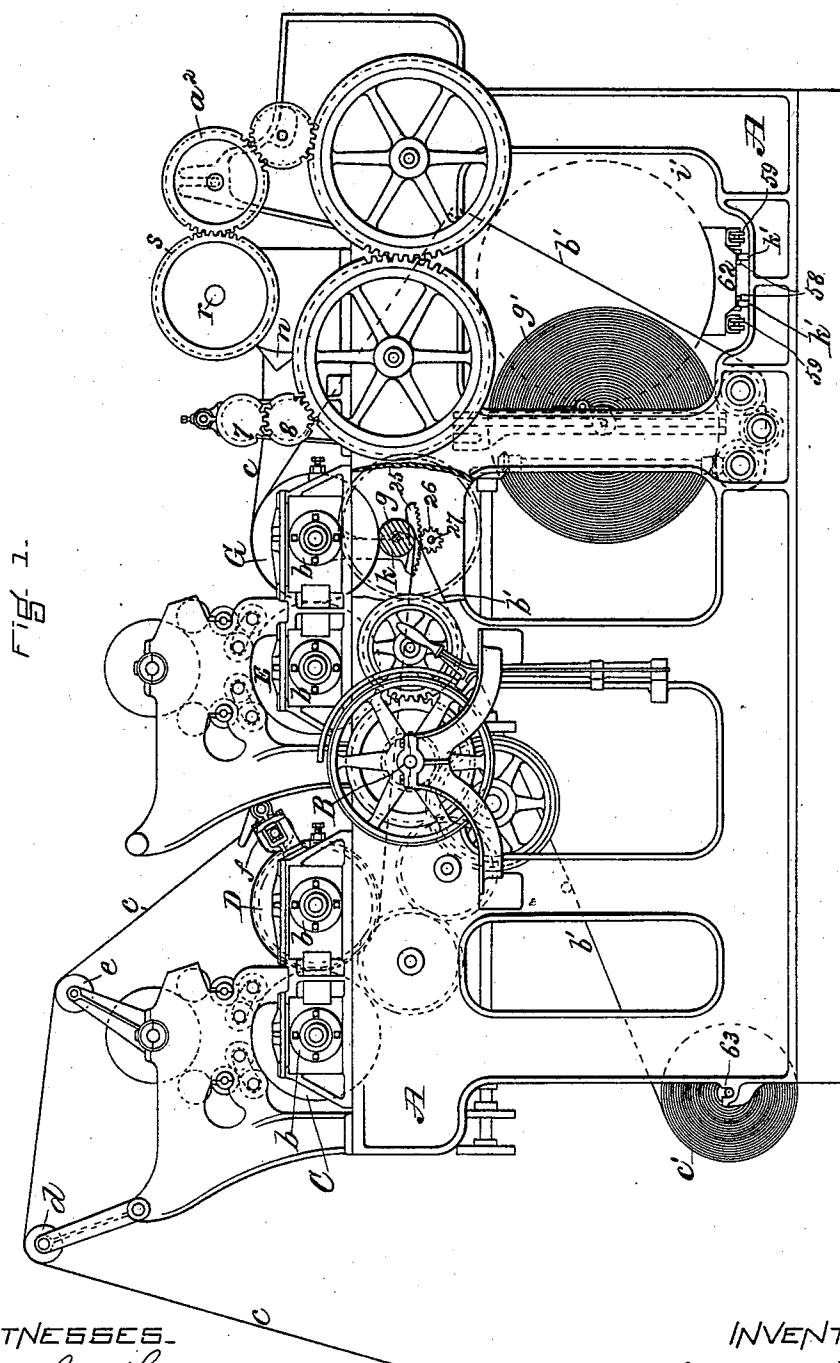
(No Model.)

4 Sheets—Sheet 1.

C. A. PINKHAM.
ROTARY PRINTING MACHINE.

No. 582,682.

Patented May 18, 1897.



WITNESSES.

J. L. Hendry.
B. L. Menden.

INVENTOR.

Charles A. Pinkham
by J. E. Schenck
Att'y

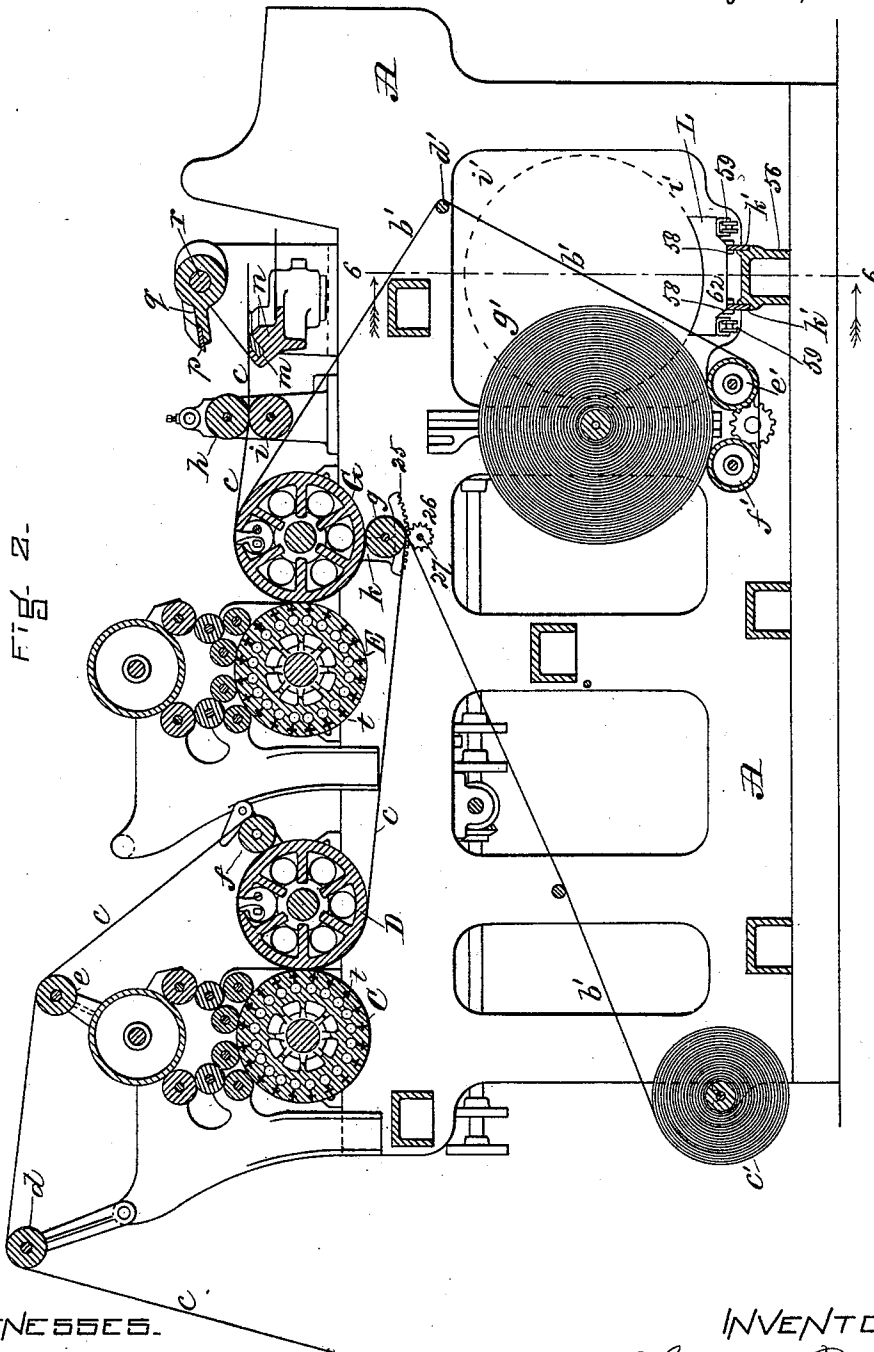
(No Model.)

4 Sheets—Sheet 2.

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by J. B. Schumacher
Att'y

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4 Sheets—Sheet 3.

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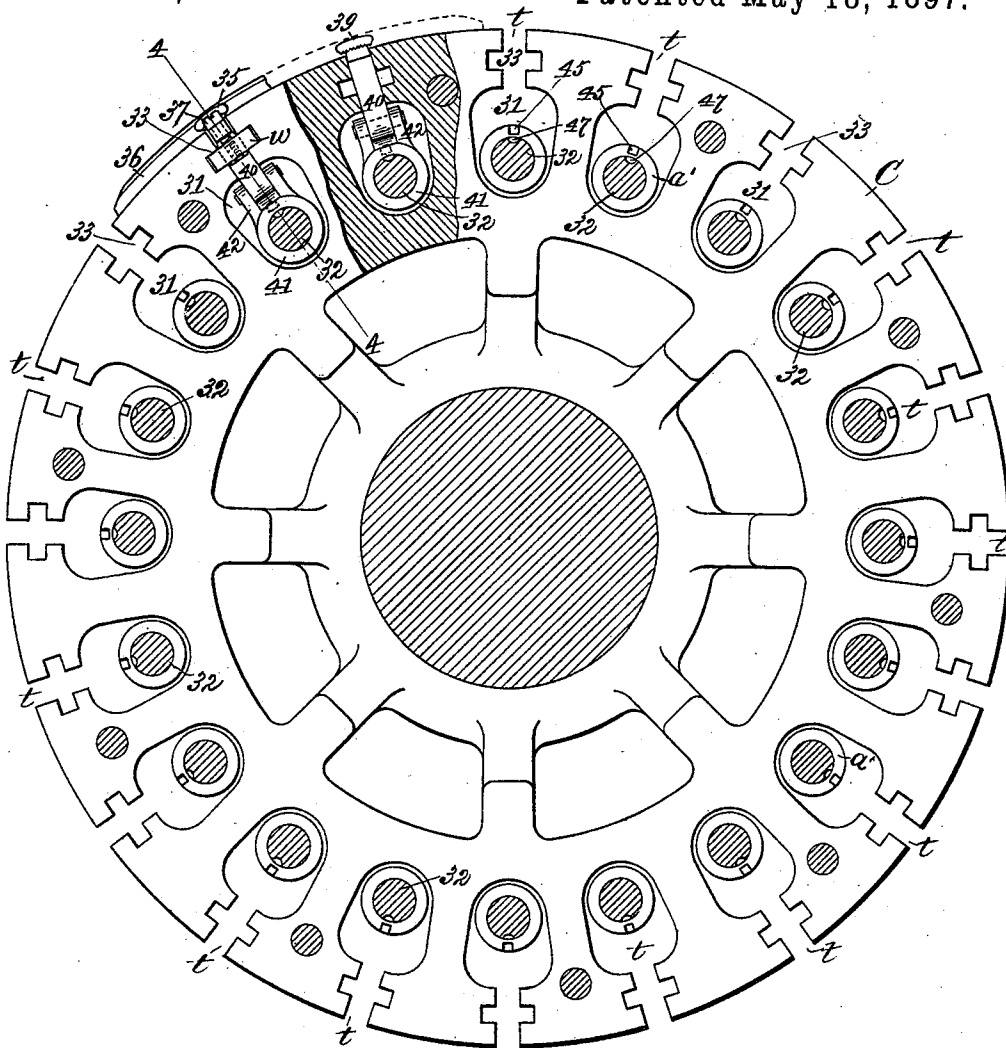


Fig. 3.

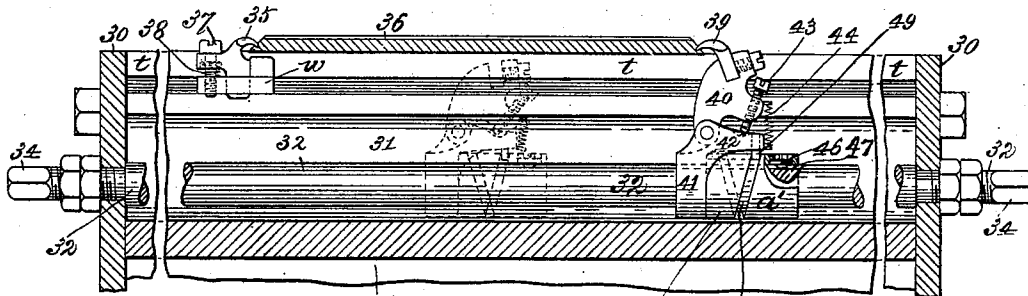


Fig. 4.

WITNESSES.

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INVENTOR.

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UNITED STATES PATENT OFFICE.

CHARLES A. PINKHAM, OF WOLLASTON, MASSACHUSETTS, ASSIGNOR TO THE
C. A. PINKHAM PRINTING AND PUBLISHING COMPANY, OF BOSTON, MAS-
SACHUSETTS.

ROTARY PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 582,682, dated May 18, 1897.

Application filed May 16, 1896. Serial No. 591,870. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. PINKHAM, a citizen of the United States, residing at Wollaston, in the county of Norfolk and State of Massachusetts, have invented certain Improvements in Rotary Web-Perfecting Printing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of a web-perfecting printing-machine embodying my improvements. Fig. 2 is a central vertical section of the same. Fig. 3 is an enlarged transverse section of one of the plate-cylinders, showing an electrotypes-plate secured thereto, two only of the longitudinal grooves of the cylinder being shown as provided with plate-fasteners. Fig. 4 is a longitudinal section of a portion of the said plate-cylinder on the line 4 4 of Fig. 3. Fig. 5 is an enlarged sectional elevation of a pair of plate and impression cylinders and their journals and journal-boxes, illustrating the mechanism for adjusting said cylinders in the direction of their length. Fig. 6 is an enlarged transverse vertical section on the line 6 6 of Fig. 2 looking in the direction of the arrow.

My invention has for its object to simplify and improve the construction of rotary web-perfecting printing-machines; and it consists in certain novel features, combinations of parts, and details of construction, as hereinafter set forth, and specifically pointed out in the claims.

In the said drawings, A represents the framework of the machine, of suitable shape to properly support the working parts.

B is the driving-shaft, from which motion is transmitted in the usual manner by suitable gearing and shafting to the two pairs of plate and impression cylinders C D E G, the journals of which rotate in boxes b, Figs. 1 and 5, in the framework A. Each plate-cylinder is provided with inking apparatus, which is of the usual construction and will not therefore be herein described.

c, Figs. 1 and 2, represents the web of paper, which is drawn from a roll (not shown) and carried over rolls d e and thence under a roll f, from which it passes between the first pair

of plate and impression cylinders C D, thence around a guide-roll g to and between the second or perfecting pair of plate and impression cylinders E G, after which it passes between a pair of feed or drawing rolls h i, Fig. 2, by which it is carried forward to the cutters, to be hereinafter described. These rolls h i are connected to rotate together by gears 7 8, as shown in Fig. 1, and revolve synchronously and continuously with an unchangeable surface velocity the same as that of the plate and impression cylinders, motion being transmitted to said rolls from the driving-shaft by suitable gearing and shafting, and in this manner a uniform tension on the web is maintained as required to produce perfect work. The shaft of the guide-roll g is mounted in a frame k, swinging on a center corresponding to the axis of the adjacent impression-cylinder G, said frame having on each side, at the bottom, a toothed sector 25, meshing with a pinion 26 on a shaft 27, having its bearings in the framework and projecting at each end, outside of the same, to admit of its being easily turned by a suitable key or handle, whereby the frame k and its guide-roll g may be swung in either direction to insure perfect register of the forms on opposite sides of the sheet.

I will now describe the mechanism by which the printed sheets are severed from the web.

m, Fig. 2, is a stationary cutter-blade which extends transversely across the machine and is secured to a supporting-bar n, and p is a rotating cutter-blade which coöperates with the stationary blade m and is secured to a carrier q, mounted on a shaft r, having its bearings in the framework and provided at one end with a gear s, receiving motion by suitable gearing and shafting from the driving-shaft B. The rotary blade p is slightly inclined, as usual, to the axis of the shaft r, and the blade m is correspondingly inclined as is necessary to produce a square cut while the web is in motion.

The rotary cutter-blade p is made to revolve at different speeds with relation to the unchangeable surface velocity of the feed-rolls h i by changing the size of the driven gear s and by removing the intermediate

gear a^2 , Fig. 1, of the train of gears, which transmit motion from the driving-shaft B to the cutter-shaft r , and substituting another gear having a different number of teeth, whereby the length of the sheet severed from the web may be increased or diminished, as desired, by varying the interval of time between successive cuts, and by this construction printed forms of different lengths and sizes can be cut off without reducing the speed of the web and consequent output of the machine, which would not be the case if the surface velocity of the feed-rolls was made variable, which in case it was desired to cut a small sheet would necessitate a reduction in the surface velocity of the plate and impression cylinders and diminish the output of the machine.

I will now describe the adjustable plate-fasteners, by which plates of various sizes can be secured in any desired position or location upon the surface of the plate-cylinder.

Each plate-cylinder is provided around its entire circumference with longitudinal grooves t , Figs. 3 and 4, placed at uniform distances apart and extending from one end of the cylinder to the other, cap-plates 30 being secured to the ends of said cylinder to cover the ends of the grooves, as shown in Fig. 4. The grooves t are of the form in cross-section shown in Fig. 3, the bottom or inner portion 31 being enlarged for the reception of a shaft 32, having its bearings in the cap-plates 30, and the outer portion 33 of said groove being made in the form of a cross for the reception of a slide w , which is provided with a vertical adjustable hook 35, adapted to catch over the edge of the electrotypes-plate 36, as shown in Figs. 3 and 4. The hook 35 is provided with a shank portion fitting an aperture in the slide w and is forced down to clamp the plate by a screw 37, which is encircled by a spiral spring 38, which serves to raise the hook when the screw is loosened, the tightening of the screw to force the hook into the plate serving to clamp the slide w immovably within the groove t , as required. The opposite edge of the plate 36 is held in place by a hook 39, adjustably secured to a lever 40, fitting within the outer or radial portion of the groove t and pivoted to a collar 41, sliding on the shaft 32, said collar having an arm 42, against which bears a screw 43, passing through the lever 40, by means of which said lever can be moved on its pivot to bring the hook 39 into the position required to engage and clamp the edge of the plate, as shown in Fig. 4, a spring 44 serving to withdraw the hook as the screw is slackened.

a' , Fig. 4, is a sleeve encircling the shaft 32 and made longitudinally adjustable thereon by means of a set-screw 46, the point of which fits within a longitudinal groove 47, Figs. 3 and 4, and this sleeve a' is provided with an inclined cam-groove 48, within which fits a pin 49, projecting down from the arm

42 and entered into said groove 48 through a longitudinal groove 45 in the sleeve a' , whereby when the shaft 32 is turned by a wrench or crank-handle applied to its squared outer end 34 the collar 41, with the lever 40 and hook 39, is moved toward or away from the edge of the plate 36, thus affording a convenient means of clamping or releasing the plate by a simple rotation of the shaft 32, the plate-fastener 35 at the opposite edge of the plate remaining undisturbed until a plate of a different size is required or the location of the plate on the cylinder is to be changed. When the position of the fastening-hook 39 requires to be changed for a change of plate or location of the same upon the cylinder, the screw 46 is loosened by means of a screw-driver introduced through the groove t and the sleeve a' and collar 41 slid on the shaft 32 to the desired position, the parts being held in place when adjusted by the set-screw 46, and by this construction the cylinder can be used for plates of any size within the limits of its length, and a series of pairs of plate-fasteners can be applied to each shaft where small plates are to be employed, in which case the entire series of plates held by said plate-fasteners can be locked or unlocked by a single movement of the shaft 32, as described. The shafts 32 are provided at their opposite ends with tightening-nuts and check-nuts, as shown in Fig. 4, whereby they are held securely in position after being turned to adjust their plate-fasteners, as before described.

The plate and impression cylinders are each made adjustable in the direction of their length, whereby the plates on one plate-cylinder can be made to register exactly with the plates on the other plate-cylinder as is necessary to produce perfect work, and so that each impression-cylinder can be adjusted an equal amount with its cooperating plate-cylinder as is necessary to prevent any disarrangement of the "make-ready" with relation to said plate-cylinder. This is effected by mounting the journals of the plate and impression cylinders in boxes b , which are fitted to slide in the direction of their length in bearings a^3 in the framework A , as shown in Fig. 5. Each of these journal-boxes is provided at its outer end with a flange 50, through which pass screws 52, bearing against the framework A , and against the outer surface of the journal-box bears a collar 53, secured to and revolving with the cylinder-shaft, whereby when it is desired to adjust the shaft longitudinally it is merely necessary to slack up or turn outward the screws 52 on one side of the machine and turn in the screws 52 on the opposite side, the latter screws forcing the journal-box outward against the collar 53, carrying with it the shaft 54, which is thus moved in the direction of its length, as desired.

b' is the offset-web, which is unwound, as usual, from a roll c' at the rear end of the

machine, thence passing around the guide-roll *g*, up between the perfecting pair of plate and impression cylinders E G, thence over a guide-bar *d'*, and under guide-rolls *e' f'* to the roll *g'*, upon which it is wound in the usual manner by means of ordinary well-known winding mechanism consisting of the two rolls *e' f'*, which form a support for the roll *g'* and are driven by suitable gearing and shafting connected with the driving-shaft B.

Immediately in front of the shaft or roller upon which the offset-web is wound is a transverse space or passage *h'*, Fig. 6, extending entirely across the machine from side to side, to which access is had through corresponding openings *i'* in the sides of the framework A, as shown in Figs. 1 and 2, and at the bottom of this space is a track *k'*, composed of two rails fastened to a bed or support 56, parallel with the offset-roll *g'*. Upon this track runs a truck L, provided with two sets of wheels, one set, 58, being adapted to run on the rails and the other set, 59, extending a little below the first set to adapt them to run upon the floor after the truck L has been run out through one of the openings *i'* and down the incline 60, Fig. 6. The truck is provided at each end with a rest 62, having its upper edge curved to receive the offset-roll, which can be easily loaded onto the truck when the latter is in the position shown in Figs. 1 and 2, after which the truck is run out through either one of the openings *i'* down the incline 60 onto the floor and thence rolled on the wheels 59 to the rear end of the machine, when the roll is lifted off the truck and its journals placed in the open bearings 63, Fig. 1, when the roll will be ready to be again used, as before, much labor and inconvenience being thereby avoided.

I do not confine myself to the employment of a truck having two sets of wheels, as it is obvious that the same wheels may be employed both for running upon the rails and upon the floor.

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

1. In a rotary web-perfecting printing-machine, plate and impression cylinders having their shafts mounted in journal-boxes movable in the direction of their length in bearings in the framework and made adjustable by means of screws, said shafts having at each end a collar bearing against the outside of the journal-box, whereby the outward movement of the journal-box is transmitted to the cylinder-shaft, substantially as described.

2. In a rotary web-printing machine, the combination with a plate-cylinder provided around its circumference with a series of grooves extending longitudinally from one end of the cylinder to the other, said grooves being each provided with an adjustable hook-shaped plate-fastener adapted to engage one edge of the plate, of shafts located within

said grooves and adapted to be turned from the end of the cylinder, said shafts being each provided with a collar sliding thereon, a lever pivoted to said collar and made adjustable thereon, by means of a set-screw and carrying a hook extending up through the groove into a position to engage and clamp the opposite edge of the plate, and a sleeve adjustable longitudinally upon said shaft and provided with a clamping-screw, said sleeve having a cam-groove engaging a pin or projection on the collar which carries the plate-fastening lever, whereby the rotation of the shaft will cause the hook-shaped plate-fastener actuated thereby to clamp the edge of the plate or recede therefrom to release the same, substantially as described.

3. In a rotary web-printing machine, the combination with a plate-cylinder having a longitudinal groove *l*, of a plate-fastener for holding one side of the plate, consisting of a slide *w* fitting the outer transverse portion of the groove, and a hook-shaped portion 35, having a shank adjustable in an aperture in said slide *w*, combined with an adjusting-screw 37 and a spring 38 for raising the hook as the screw is loosened or turned outward, substantially as described.

4. In a rotary web-printing machine, the combination with a plate-cylinder having a longitudinal groove *t*, of the form shown, of a shaft 32, extending longitudinally from one end of the cylinder to the other and having its bearings in the heads or cap-plates 30, and having its ends extended outside the same to permit of its being turned by a wrench or key, the collar 41 sliding on the shaft 32 and having an arm 42, the lever 40 pivoted to the collar 41 and carrying the hook-shaped plate-fastener 39, the adjusting-screw 43 and spring 44, and the sleeve *a'* adjustable on the shaft 32 and provided with a clamping-screw 46, said sleeve having a cam-groove acting on a pin or projection on the arm 42 of the collar 41, whereby the rotation of the sleeve *a'* will cause the hook 39 to advance toward or recede from the edge of the plate on the surface of the plate-cylinder, substantially as set forth.

5. In a rotary web-printing machine, the combination with the plate and impression cylinders, of a guide-roll mounted in a frame swinging around the axis of one of said cylinders as a center and provided with toothed sectors at its lower end, and pinions engaging said sectors and mounted on a shaft having its bearings in the framework and extending outside the same to permit of its being turned by a handle or key to vary the position of the guide-roll, substantially as described.

Witness my hand this 14th day of May, A. D. 1896.

CHARLES A. PINKHAM.

In presence of—

P. E. TESCHEMACHER,
B. L. MARDEN.