

(No Model.)

3 Sheets—Sheet 1.

J. B. CLINE.

CHROMATIC INKING APPARATUS FOR PRINTING PRESSES.

No. 553,228

Patented Jan. 21, 1896.

Fig. 1.

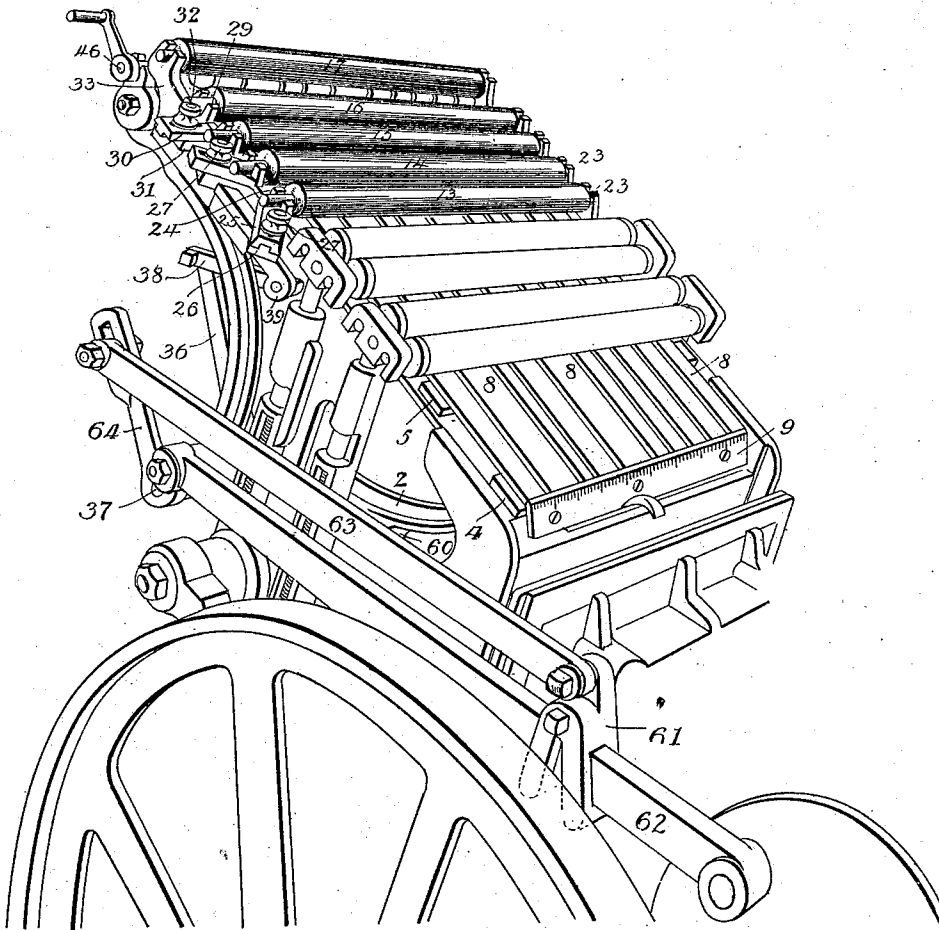


Fig. 7.

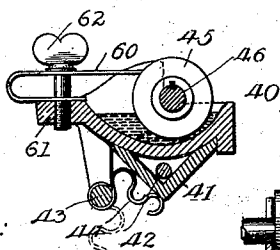


Fig. 8.

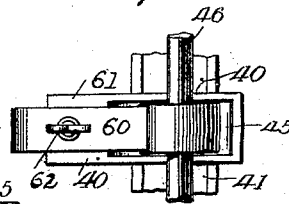
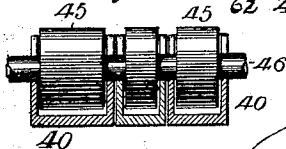


Fig. 6.



Witnesses:
Samuel Kennedy
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By P. M. Lodge, Att.

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Fig. 2.

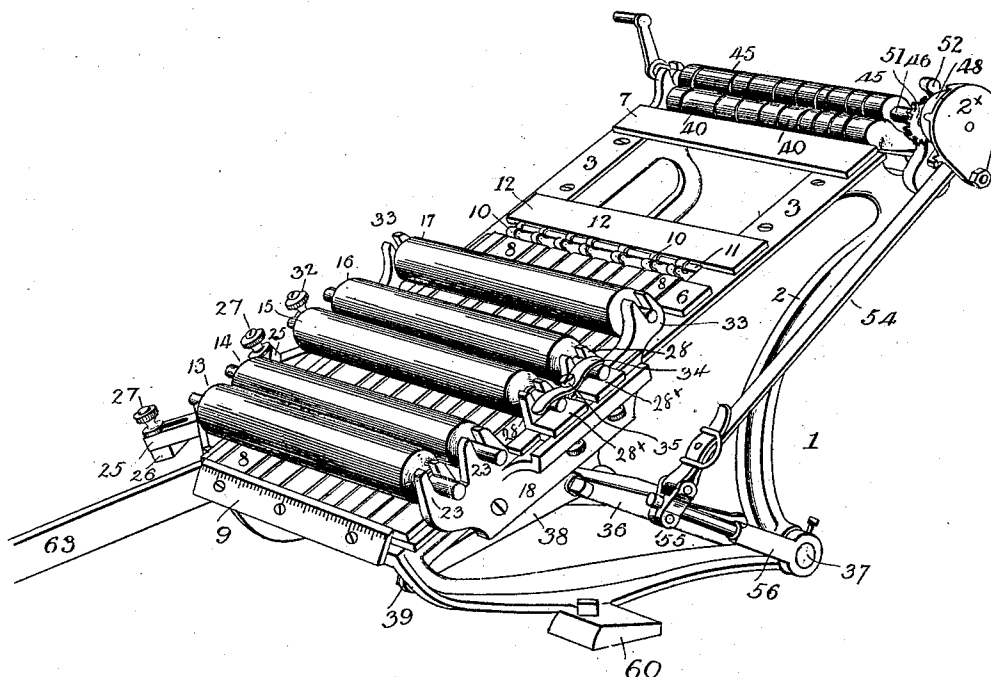


Fig. 5.
on line a-a.

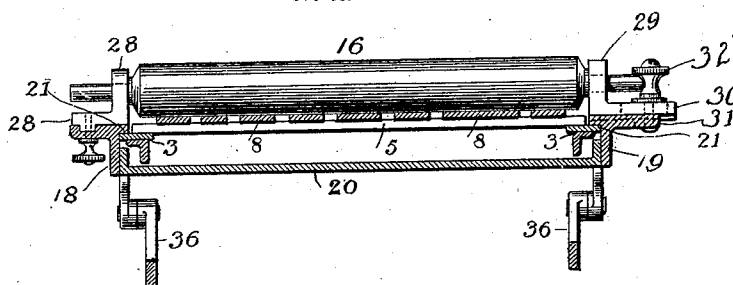
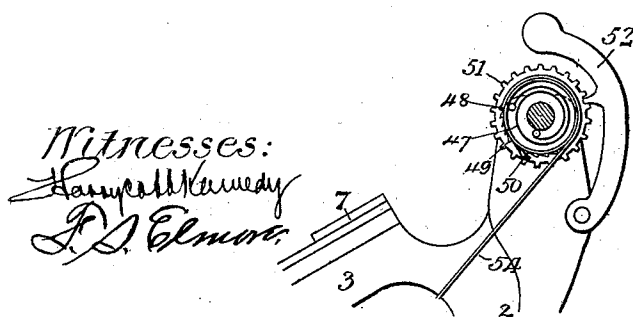


Fig. 9.



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(No Model.)

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Fig. 4.

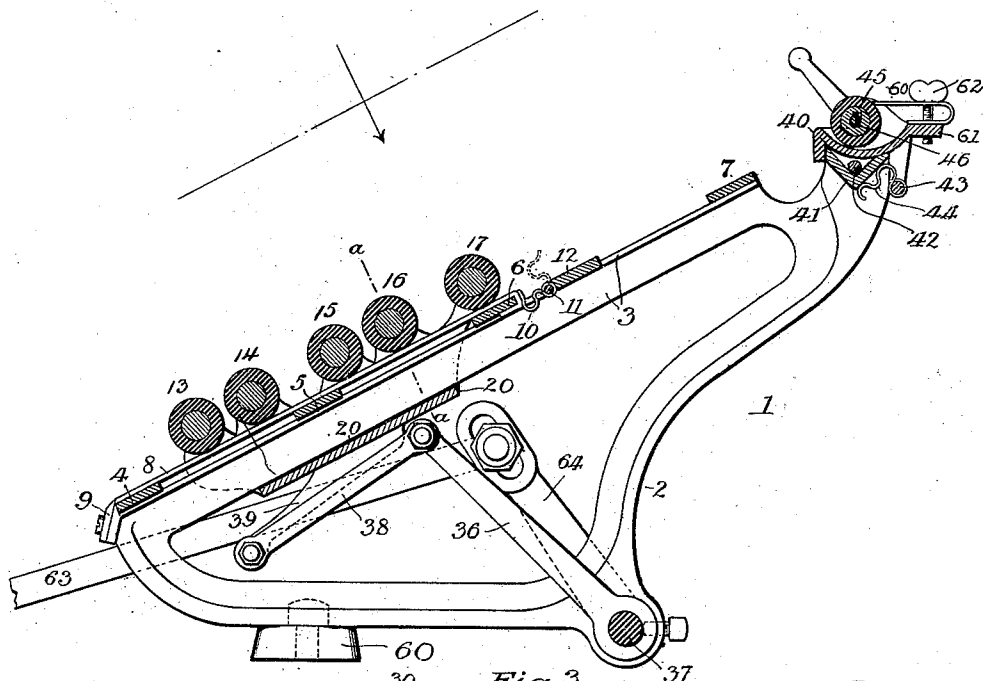
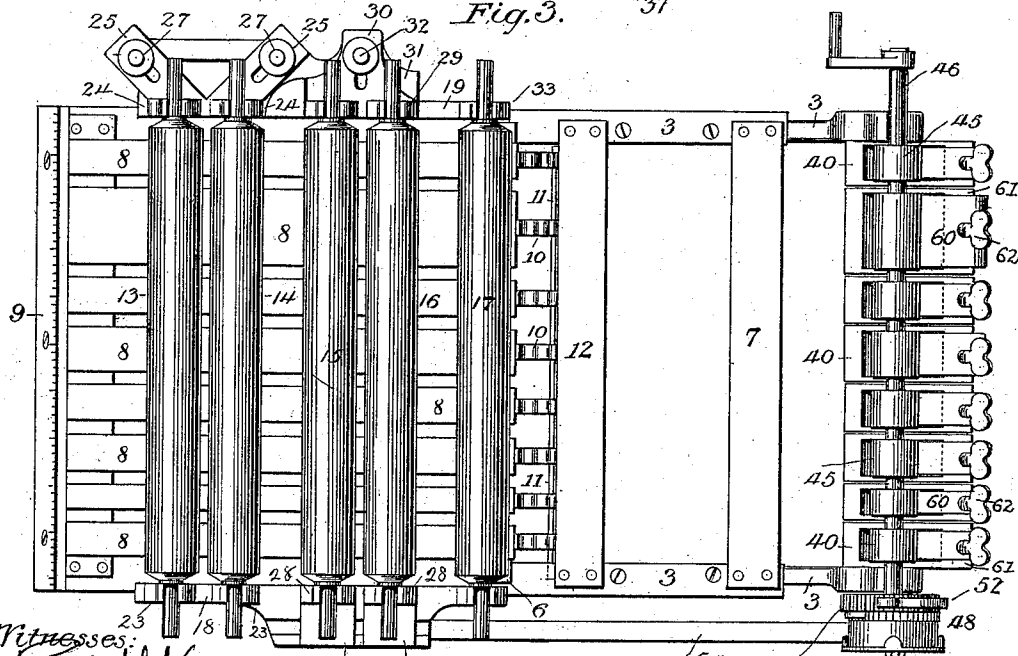


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN B. CLINE, OF JEFFERSON, IOWA.

CHROMATIC INKING APPARATUS FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 553,228, dated January 21, 1896.

Application filed January 31, 1895. Serial No. 536,825. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. CLINE, of Jefferson, county of Greene, and State of Iowa, have invented a new and useful Improvement in Chromatic Inking Apparatus for Printing-Presses, of which the following is a specification.

This invention relates to a color-inking mechanism for printing-presses by which different lines of type may be supplied with inks of different colors and by a single impression printed matter produced composed of different-colored lines.

The object of the invention is to produce a device of this character which will be practical and effective in operation and which may be applied as an attachment to any of the presses of the various well-known forms now in general use; and with these ends in view my invention consists in the various features of construction and combination of parts hereinafter fully described in the specification, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of my improved device shown as applied to a disk-inking press of the well-known Gordon type. Fig. 2 is a perspective view of the device removed, as viewed from the opposite side. Fig. 3 is a top plan view of the same. Fig. 4 is a longitudinal section from front to rear. Fig. 5 is a transverse section on the line *a a* of Fig. 4. Fig. 6 is a vertical longitudinal section through a portion of the ink-reservoir. Fig. 7 is a vertical transverse section on an enlarged scale through one of the independent sections of the ink-reservoir. Fig. 8 is a top plan view of the same. Fig. 9 is a side elevation of the upper end of the device, showing the mechanism for operating the rollers in the ink-reservoir, certain portions being broken away to expose other parts to view.

Referring to the drawings, 1 represents a casting or frame consisting of two triangular side frames 2, having fixed to their upper inclined edges two parallel longitudinally-extending rails 3, connected at intervals by a series of transverse connecting-pieces 4, 5, 6, and 7, attached at their ends thereto, these rails and connecting-pieces constituting an inclined flat bed upon which suitable distributing and inking rollers are adapted to

travel back and forth, as more fully described hereinafter.

Seated upon the transverse connecting-pieces and extending longitudinally of the bed are a series of color-strips 8, of varying widths and arranged at varying distances apart, corresponding to the size of the type composing the lines of printed matter and the width of the spaces between the lines. The strips are removably confined on the bed and terminate some distance from the upper end of the same, the purpose of which will presently appear. At their lower ends they are seated against the upper projecting edge of an inclined plate 9, extending horizontally across the lower end of the body and secured thereto in any suitable manner. This plate is provided with suitable graduations to facilitate the proper adjustment of the color-strips with respect to the lines of type and the width of the spaces between them. At their upper ends the strips are folded around the upper edge of the transverse graduated connecting-piece 6, and the folded end of each strip is engaged by a locking-finger 10. These fingers are formed of metallic strips bent at one end to loosely encircle a horizontal transverse shaft 11, and folded back and forth to constitute a spring, the arrangement being such that when the finger is turned down and engaged with the end of the strip it will hold the same securely in position, and when disengaged therefrom, as shown in dotted lines, the strip may be removed. The shaft 11, on which these locking-fingers are mounted, is removably sustained on the bed, so that the fingers may be removed and replaced by others to correspond with the width of the color-strips.

To prevent the shaft from bending a plate 12 is secured to the bed in rear of the shaft and has its front edge grooved to permit it to be placed closely against the shaft, as shown in Fig. 4.

From the foregoing description it will be seen that the color-strips may be conveniently removed when desired and replaced by others, according to the character of printing desired, the width of the type and the spaces between the lines, &c.

The distributing-rollers referred to are five in number, 13, 14, 15, 16, and 17, the office of

the upper roller, 17, the ductor, being to receive on its surface the different-colored inks from the reservoir and apply the same to the strips, upon which the inks are uniformly and evenly spread by the distributing-rollers, as more fully described hereinafter. These rollers are carried by a reciprocating carriage consisting of two side plates 18 and 19, connected together by a horizontal plate 20, extending beneath the bed and firmly secured at its ends to the side plates by means of screws, or otherwise. The inner edges of the two side plates are formed with shoulders 21, which travel on the edges of the two inclined rails 3, by which arrangement the carriage is guided in its movement on the bed from one end to the other.

Near its lower end the side plate 18 is formed with two vertical lugs 23, containing open slots in which are seated the ends of the spindles of the two lower distributing-rollers, 13 and 14, the opposite ends of the spindles being seated in similar slots in two vertical lugs 24, projecting upward from the inner ends of two adjustable plates 25, carried by the opposite side plate 19. These adjustable plates have their under sides recessed to receive guiding-ribs on lateral extensions 26, projecting from the side plate, the construction being such that the adjustable plates may be moved obliquely outward in diverging lines, and in this way cause the separation of the ends of the rollers, so that the latter will extend obliquely across the face of the color-strips. Set-screws 27 are provided for holding the adjustable plates in the position desired.

The two upper distributing-rollers, 15 and 16, have their spindles mounted at one end in slots in two vertical lugs 29, rising from the inner end of an adjustable plate 30, which latter slides in guides on a lateral extension 31, projecting from the side plate 19 and held by a nut 32. The opposite ends of the spindles are seated in slotted lugs 28 rising from two plates 28^x, seated upon the plate 18 and adjustable longitudinally of the same independently. By adjusting the plates 28^x the rollers may be caused to assume a greater or less inclination across the bed, the purpose of which will presently appear.

The ductor-roller has its spindles seated at its ends in open slots on the ends of two arms 33, extending upward at an inclination from the two side plates of the carriage, the said roller extending transversely across the bed parallel with the ink-reservoir.

The purpose of setting the distributing-rollers so that they will extend obliquely across the face of the strips is to insure the uniform and proper distribution of the inks on the various color-strips. The inks will be carried by the rollers from one edge of the strip laterally to the opposite edge on account of the obliquity of the roller, so that there will be no danger of an accumulation of ink on one edge or at any point on the strips. By

providing for the adjustment of the distributing-rollers by means of the movable bearings described I am enabled to regulate to a nicety the position of the rollers with respect to the spaces between the strips and the width of the same.

When small distributing-rollers are employed in small machines, I have found it desirable to provide means for holding the spindles in their bearings, and for this purpose I employ horizontal spring-plates 34, which bear upon the upper sides of the spindles and which are held by means of set-screws 35.

A reciprocating motion is imparted to the carriage by means of two arms 36, connected at their lower ends to a rock-shaft 37 mounted in bearings in the lower ends of the triangular frames 2, and pivoted at their upper ends to links 38, which are in turn pivoted at their ends to downward and forwardly extending arms 39, projecting from the underside of the carriage. By the rocking shaft the carriage is caused to travel from the lower end of the bed, as shown in Fig. 2, to its upper end, with the ductor-roller in position to receive the ink from the reservoir, as shown in Fig. 1.

The reservoir for containing the different-colored inks consists of independent and separate sections, which are arranged in a transverse line side by side, and at the upper end of the inclined bed. Each section is for a distinct color and the sections are independently removable, each being of a width to correspond to the width of its color-strip, which in turn corresponds to the width of the type which is to receive its particular color. The individual sections each consist of a trough or cup 40, which troughs are seated side by side on the upper edges of a channel-strip 41, extending transversely across the upper end of the bed and firmly secured between the upper ends of the two triangular frames by a tie-rod 42, provided on its end with a tightening-nut. Each trough is provided with a depending lug 43 having hinged to its lower end a spring locking-finger 44, adapted to be engaged with the inclined side of the channel-strip and serving, when thus engaged, to hold the trough in the position it is set. When disengaged, as shown by dotted lines in Fig. 7, the trough may be moved laterally along the strip or entirely removed therefrom, as desired. By the construction described each trough is individually and independently removable and is also adjustable laterally, and this is a great advantage, as it is frequently necessary to change the position of the troughs or replace the same by others to meet the corresponding changes of the colors and the types employed. In each trough a roller 45 revolves and the various rollers are splined to a common shaft 46, extending horizontally along the upper edges of the troughs and mounted at its ends in suitable bearings in the upper ends of the two triangular frames before alluded to. The rollers are loose on the shaft so

far as their longitudinal movement is concerned, and are limited in their movement by the sides of the troughs. The location of the rollers is such that when the carriage arrives at the limit of its upward movement on the bed the ductor-roller will contact with the rollers and will receive the different inks on its surface, mechanism being provided to cause the rotation of the rollers at the moment of contact, which will act to turn the ductor by friction, and the latter will at the same time receive on its surface stripes of the different-colored inks contained in the several troughs.

The movement of the shaft on which the rollers are mounted is effected by a coiled spring 47, having one end connected to a fixed plate 2^x, and its opposite end connected to a barrel or casing 48 mounted to revolve upon the shaft. This casing is provided with a series of ratchet-teeth 49 engaged by a pawl 50 pivoted to the side of a toothed wheel 51, keyed to the shaft. This toothed wheel is prevented from rotating by a pivoted dog 52, having one end formed to enter between the teeth on the wheel and its opposite end arranged in the path of the reciprocating carriage. The form of the dog is such that it will normally engage and hold the wheel, but will be permitted by being engaged by the carriage to release the wheel. The arrangement of the parts is such that the dog will be disengaged from the toothed wheel and permit the rotation of the shaft under the influence of the spring when the ductor-roller has reached the limit of its upward movement and is in contact with the rollers in the troughs. At this time the rollers will revolve and apply the inks to the ductor-roller, and on the return of the latter the locking-dog will again engage the toothed wheel and prevent the further rotation of the rollers. In order to provide for the winding up of the spring, I secure to the outer surface of the barrel one end of a strap 54, the other end of which is connected to an adjustable clamp 55, secured to the outer end of an arm 56, having its inner end connected to the rock-shaft 37. When the spring is uncoiled and in its expanded state, the strap will be wound several times around the barrel, so that when the arm to which the other end of the strap is connected is moved rearward to the position shown in Fig. 2 the barrel will be rotated and will wind up the spring. When the arm is moved forward to the position shown in Fig. 1, the strap will slacken, and when the carriage releases the toothed wheel by engaging the locking-dog the spring in expanding will, through the connection of the barrel with the toothed wheel, cause the rotation of the shaft and at the same time wind the strap on the casing, ready to be again drawn by the arm to wind up the spring.

By providing a space between the upper ends of the color-strips and the ink-reservoir the ductor and distributing rollers, after they

have left the color-strips, will rotate slightly from momentum, and in this way they will not contact with the strips at the same point on their surface on every movement back and forth.

Two or more colors may be blended in a single line by applying narrow troughs, the combined width of which will about equal the width of the color-strip to be supplied. The slight and regular vibratory movement of the distributing-rollers will be sufficient in this case to evenly blend the colors, while the constant removal and supply of the inks prevents an objectionable accumulation, and hence prevents blending beyond the desired limit.

In applying my attachment to a press of the Gordon type the ink-disk and its supporting-frame are removed and my device applied and fastened by suitable bolts extending through lugs 60 on the base of the triangular frames. A clamp 61 is attached to the front end of a pitman 62 actuating the press roller-carriage, and to this clamp a link 63 is pivoted at one end and has its opposite end pivoted to an arm 64, connected to rock-shaft 37 before referred to. The form-rollers of the press, when the distributing-rollers are at the upper end of the bed, pass on to the color-strips and receive on their surfaces the stripes of the various colors, and from the color-strips they pass over the face of the type and apply to the same the different-colored inks in which the impression is to appear.

It will be observed that the front walls of the troughs extend or flare outward some distance beyond the face of the rollers therein, thus leaving at the front wide spaces between the edge of the trough and the roller, so that there will be no liability of the rollers depositing ink on the edge of the trough, which action would result were the latter close to the face of the roller.

Each ink-trough is provided with a scraper 60 in the form of a spring-plate having its rear end bent downward and extended a short distance forward and seated upon a rearwardly-projecting lug 61 on the trough. These scrapers are held in place by set-screws 62 and their forward ends rest upon the surface of the rollers above their axes, and they serve to prevent an undue amount of ink being taken by the rollers. The pressure of the ends of the scrapers on the rollers may be varied by the set-screws, and by this means the amount of ink supplied to the ductor may be regulated according to the circumstances of the case.

Having thus described my invention, what I claim is—

1. In a mechanism of the type described the combination of a bed or frame provided with longitudinally extending guide rails or tracks, a series of color strips extending from one end for a portion of the length of the same, an ink reservoir at the opposite end of the bed; whereby a space is left between the ends

of the strips and the reservoir, a carriage mounted on, and arranged to traverse said tracks, means for reciprocating the carriage, and distributing rollers mounted in bearings
5 in said carriage, and rotatable independently of the movement of the same; whereby the rollers will revolve slightly by momentum after being carried by the carriage beyond the ends of the strips.

10 2. In a printing press the combination of a bed, a series of color strips extending longitudinally thereof, an ink reservoir at the upper end of the bed, reciprocating distributing rollers arranged to traverse the bed, receive
15 the ink from the reservoir, and apply the same to the color strips, a carriage in which said rollers are mounted, a rock-shaft, connections between the rock-shaft and the carriage, an arm on the rock-shaft, inking rollers
20 adapted to traverse the color strips and the faces of the types, a carriage carrying said inking rollers, a pitman arranged to actuate said carriage and suitable connections between the pitman and the arm on the rock-
25 shaft.

3. In combination with a bed, a series of color strips removably seated thereon, a transverse removable shaft sustained by the bed at the upper ends of the strips, and a series
30 of independent locking devices encircling at one end said shaft and arranged to engage at their opposite ends the ends of the strips.

4. In combination with a bed provided with a transverse supporting plate, a series of separate ink containing troughs seated upon said
35 plate, and a series of hinged locking fingers pivoted to the troughs and arranged to engage the plate and thereby hold the troughs fixedly in position.

40 5. In combination with the ink trough the roller therein, the actuating mechanism tending to revolve the same, a locking device to prevent the revolution of the roller, a distributing roller or ductor adapted to contact
45 with the roller in the trough, and means for releasing the locking device at the moment of contact of said rollers.

6. In combination with the series of ink

containing troughs arranged side by side, rollers located therein, a shaft on which the
50 rollers are mounted, a spring acting on the shaft and tending to rotate the same, a reciprocating carriage provided with a distributing roller or ductor, adapted to contact with the rollers in the troughs and a locking device to
55 prevent the rotation of the shaft, said locking device adapted to be engaged and released by the carriage at the moment of the contact of the rollers.

7. In combination with a series of ink
60 troughs, rollers therein, a coiled spring tending to turn the rollers, a locking device to prevent the rotation of the same, a reciprocating carriage carrying a ductor, adapted on the upward movement of the carriage to con-
65 tact with the rollers in the troughs, means for releasing the locking device at the moment of contact, and means controlled by the return movement of the carriage for placing the spring under tension.

8. In combination with a bed, an ink reservoir at its upper end comprising a series of
70 troughs, rollers in said troughs, a shaft on which the rollers are mounted, a coiled spring acting on the shaft and tending when under tension to rotate the same, a locking device
75 to prevent the rotation of the shaft, a reciprocating carriage movable on the bed a distributing roller on the carriage arranged to contact with the rollers in the troughs on the
80 upward movement of the carriage, means for releasing the shaft at the moment of contact of the rollers, a rock-shaft, connections between the same and carriage for moving it,
85 an arm on the rock-shaft and suitable connections between the end of the arm and the spring adapted to wind the latter on the rearward movement of the carriage.

In testimony whereof I hereunto set my hand, this 14th day of December, 1894, in the
90 presence of two attesting witnesses.

JNO. B. CLINE.

Witnesses:

J. M. FORBES,

J. A. GALLAHER.