

(No Model.)

3 Sheets—Sheet 1.

C. G. HARRIS.

APPARATUS FOR FEEDING PAPER TO PRINTING PRESSES.

No. 577,299.

Patented Feb. 16, 1897.

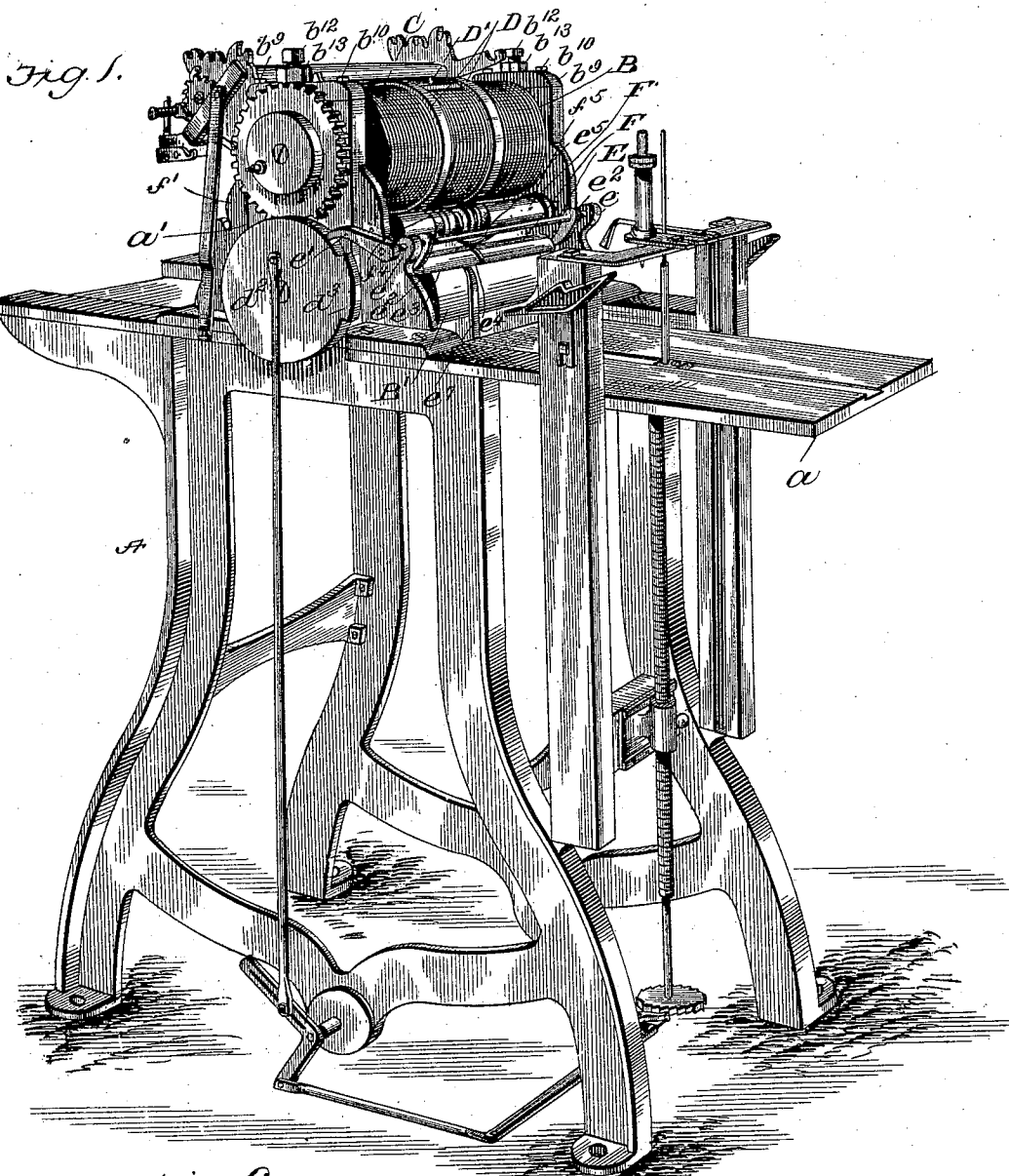
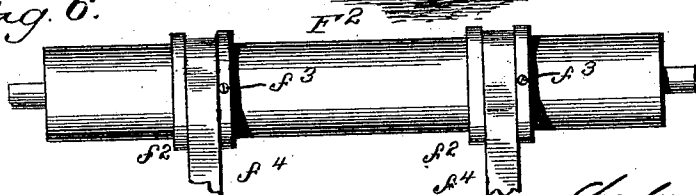
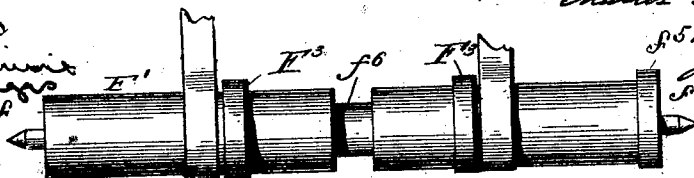


Fig. 6.



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Fig. 2

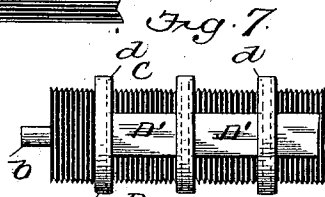
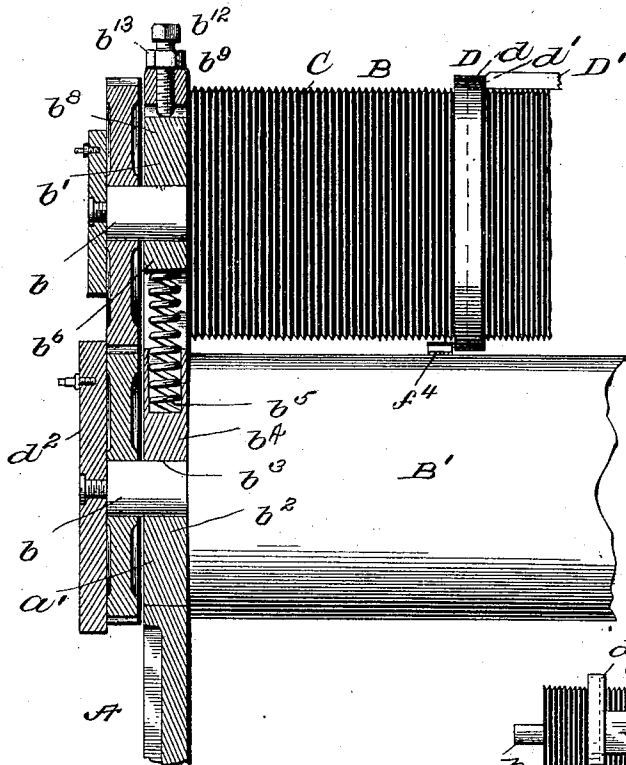
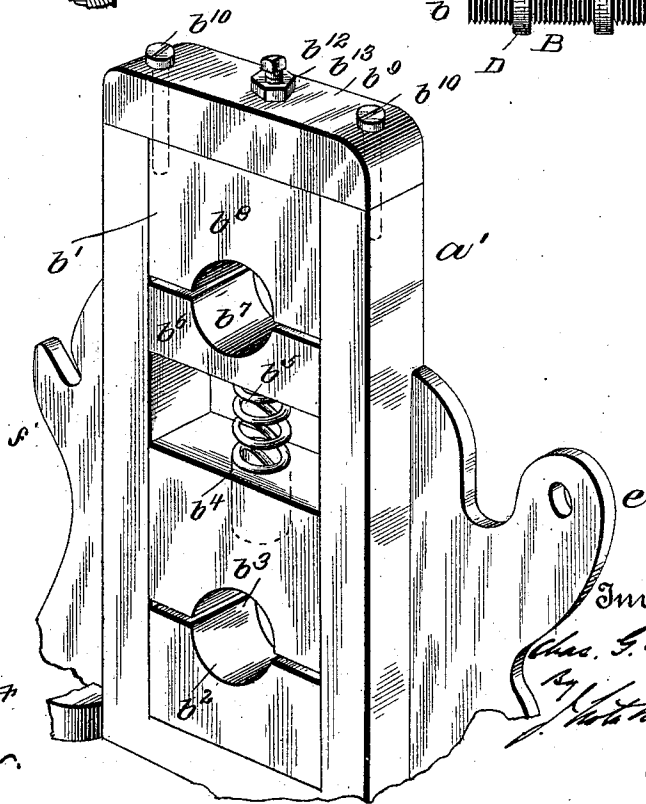


Fig. 3



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UNITED STATES PATENT OFFICE.

CHARLES G. HARRIS, OF NILES, OHIO.

APPARATUS FOR FEEDING PAPER TO PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 577,299, dated February 16, 1897.

Application filed March 7, 1894. Serial No. 502,738. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. HARRIS, of Niles, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Printing-Presses; 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.

This invention contemplates certain new and useful improvements in printing-presses, and has reference particularly to that class employing a rotary cylinder carrying a stereotype or electrotype or other printing-plate.

The object of the invention is to insure the proper setting of the paper, card, envelop, or the like on the impression-cylinder of a printing-press while said cylinder is rotating and cause the same to accurately "register" or aline for receiving the imprint of the impression-plate. This object I accomplish by providing a printing-press with suitable mechanism for positioning a sheet of paper or other substance to be printed on the impression-cylinder, such sheet of paper or other substance being given an accelerated movement, that is, caused to travel at a speed greater than that at which the impression-cylinder is rotated, whereby it will be fed up against the stop-pins on the impression-cylinder in advance of the contact of the printing-plate.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in perspective of my improved printing-press with some of the parts removed. Fig. 2 is a vertical sectional view with parts broken away, showing one of the journals of each of the cylinders and their adjustable bearing. Fig. 3 is a perspective view of the latter. Fig. 4 is an enlarged view in side elevation, with parts broken away, of the mechanism for positioning or "registering" the paper. Figs. 5 and 6 are details thereof. Figs. 7 and 8 are views of modifications.

Referring to the drawings, A designates the framework, and a the feed-table. The framework has opposite uprights a' , between which are located upper and lower cylinders

B B', the former being designated the "type" or "plate" carrying cylinder and the latter the "impression-cylinder," for receiving and supporting the cards, paper, cloth, or other substance while being printed. These cylinders at their ends have journals b , supported by bearings b' , located in uprights a' , suitable slots being formed in said uprights. At the bottom of this slot is a grooved or socketed block b^2 and above it a block b^4 , having a socket b^3 , the ends of this latter block resting on the block b^2 . In a bore in block b^4 is a coil-spring b^5 , which supports an upper block b^6 , having a semicircular socket b^7 . Above this is a socketed block b^8 . In the circular openings formed by the semicircular sockets of these blocks fit the journals of the cylinders. A cap-plate b^9 is secured by bolts b^{10} to the uprights a' , and a bolt b^{12} engages block b^8 , and a binding-nut b^{13} thereon enables the operator to raise or lower the cylinder B, so that the impression-cylinder and stereotype-plates will be just as close as desired, or cause the impression to be just as hard or light as may be necessary. By this arrangement the cylinders are permitted to work freely, and all jarring and unevenness of movement is prevented.

The type or plate carrying cylinder B is externally screw-threaded at C, said thread extending from one end of the cylinder to the other. Upon this threaded cylinder are bands or collars D, which can be readily adjusted and held at any desired point by any suitable means. The threads on the cylinder serve also to take out slight irregularities on the back of the stereotype, and hence the necessity of planing the latter is avoided. These bands or collars have overhanging flanges d , which are designed to accommodate or fit over the reduced edges d' of the printing-plate D'. A plurality of printing-plates can be attached to this cylinder, if desired, additional collars being used. (See Fig. 7.) One collar can serve to retain the opposed edges of two plates. These collars are interchangeable, and both edges of each collar or band are beveled for the purpose. Upon one of the journals of the impression-cylinder is a disk d^2 , having a segment of its periphery forming a shoulder d^3 .

E is a rock-shaft, loosely mounted near its ends in bearings e , extending from frame A,

and to one end of this shaft is rigidly secured an arm e' , the outer curved end of which is always in contact with the periphery of the disk d^2 . When the shoulder of this disk strikes against the arm e' , the shaft E is caused to rock or move to a limited extent. Also keyed to this shaft E are two arms e^2 , which at their lower inner ends support the journals of a paper-feeding roller F. Immediately over the latter roller is a guide bar or plate e^3 , secured at its ends to the arms e^2 , by which it is carried. At the center of this guide-bar is a small plate-spring e^4 , which extends transversely thereover, and its free end is designed to slightly bear against a tongue e^5 , which is secured to rock-shaft E by a screw e^6 . The inner free end of this tongue e^5 is designed to overlap the upper curved end of a rigid stop-bar e^7 , made fast at its lower end to the frame A, said stop-bar being in rear of the roller F and guide bar or plate e^3 . Additional tongues and plate-springs may be used if required. Extended longitudinally over the impression-cylinder, in front and rear thereof, are two rollers $F' F^2$, the former of which has reduced or pointed journals f fitted in holes in the sides of frame A, while the journal of the latter roller is supported by arms f' of said frame. Upon the roller F^2 are secured two or more spools f^2 , which are adjustable and held fast by screws f^3 , engaging the roller. Around the spools are passed tapes f^4 , preferably elastic, which also pass around the forward roller F' and bear upon the upper portion of the impression-cylinder in their forward movement, but held out of contact with and above said cylinder in their return movement. The roller F' is of varying diameter, that is, it has two or more rings or peripheral enlargements F^3 , and at its center is cut away or reduced to form a circular recess f^6 when but one tongue and plate-spring are used, said recess being intended to accommodate the latter when the roller F is elevated, but said roller F' may be reduced anywhere for the purpose, and when more plate-springs are used any number of corresponding reductions are made. (See Fig. 8.) At or near one end this roller has a peripheral flange or enlargement f^5 , which is designed to be constantly in contact with a corresponding flange or collar f^8 on the impression-cylinder, (or its motion may be derived by cog-wheels, belts, or other mechanical devices,) the latter giving its roller F' its movement and causing the tapes to move forward in contact with said impression-cylinder and revolve the spools with their shaft. The roller F is caused to revolve when brought into contact with the maximum circumferential portions or enlargements F^3 of the roller F' by the rocking of shaft E, effected by the arm of said shaft being engaged by the shoulder on the disk. At the same time the tongue carried by said rock-shaft is raised, as is also the guide-bar and its spring, said tongue being extended out of the way into the circular recess of roller F' . The card,

paper, or envelop or the like fed by any suitable feeder over the top of the guide bar or plate passes between the tongue and the plate-spring, and its forward movement is arrested by contact with the stop-bar e^7 , and it is there held as against reverse movement by the plate-spring bearing against the tongue, but should the paper be thin and the rapid feeding thereof cause each sheet to curve up, as often occurs from too great a feed, all that portion of the sheet-paper in rear of such point of contact being free is allowed to flatten itself out, thus making a first proper and correct alinement or register of the paper. As soon as the rock-shaft is operated the paper is elevated into contact with the feed-roller F' by the upward movement of the guide bar or plate and the second feed-roller F, and by reason of the contact of the latter with the rings or enlargements F^3 of said roller F' the paper is fed to the impression-cylinder and caused to make an additional or second register with or be properly alined against the stop-pins p on said cylinder, to which latter it is held by the bands or tapes. The maximum circumferential portion of the feed-roller F' is given a motion faster than that of the impression-cylinder B' , by which it is revolved, and hence, when the roller F is thrown into contact therewith or against the peripheries of rings or enlargements F^3 , the paper is given an accelerated movement and is caused to travel faster than said cylinder, so as to overtake and register with the receding stop-pins. By this time the paper has been fully grasped by the carrying-tapes and the rock-shaft is lowered to its normal position, the shoulder on the disk of the impression-cylinder having passed the arm of the rock-bar. In this way an accurate and positive alinement of the paper is obtained, and in consequence should the same sheet of paper be again passed through the machine the imprint of the printing-plate will be the same in each instance.

In connection with the improved features of construction hereinbefore described it will be understood that any preferred form of feeder and feed-regulator may be employed.

The advantages of my invention are apparent to those skilled in the art, and it will be specially observed that by means of my improvements high speed and accurate and superior results may be obtained, and that job-presses can be constructed according to my invention without materially adding to the cost thereof and at the same time securing perfection of workmanship.

I claim as my invention—

1. A printing-press, comprising a rotary cylinder provided with stops on its periphery, and means for feeding paper on said cylinder against said stops while the same is in motion, said paper being fed at a speed greater than that at which the cylinder is rotated, substantially as set forth.

2. A printing-press having a rotary cylin-

der provided with stops on its periphery, and means, periodically operated, as said stops are receding, for feeding paper up to and against said stops at a speed greater than that at which the cylinder is rotated, substantially as set forth.

3. A printing-press having a rotary impression-cylinder and means for positioning or registering paper on said cylinder and causing the paper to travel at a speed greater than that at which the cylinder is rotated, comprising two rollers, one of said rollers being operated by the other, which latter is of varying diameter, the first-mentioned roller being designed to engage the points of greatest diameter of said latter roller, and belts engaging said impression-cylinder and one of said rollers, substantially as set forth.

4. A printing-press having a rotary impression-cylinder and means for positioning or registering paper on said cylinder and causing the paper to travel at a speed greater than that at which the cylinder is rotated, comprising a constantly-rotated roller of varying diameter, and a second roller driven by said former roller when in engagement with the points of greatest diameter of said former roller, and belts engaging said impression-cylinder and one of said rollers, substantially as set forth.

5. A printing-press having a rotary impression-cylinder provided with stops on its periphery, and mechanism for positioning or registering paper on said impression-cylinder against said stops while said cylinder is being rotated, comprising a constantly-rotated feed-roller, a second feed-roller designed to be periodically rotated by contact with said former feed-roller, and means for guiding the paper or the like between said feed-rollers, and holding the same until grasped by said feed-rollers and fed forward thereby to or against said stops, the contact of said feed-rollers being periodically effected according to the position of said impression-cylinder, substantially as set forth.

6. A printing-press having a rotary impression-cylinder and provided with stops on its periphery, and mechanism for feeding the paper at a greater speed than that at which the impression-cylinder is rotated and positioning or registering the same on said impression-cylinder against said stops, the same comprising a constantly-rotated feed-roller having rings or enlargements, a second feed-roller, means for periodically raising said second feed-roller into frictional contact with said rings or enlargements of said former feed-roller, whereby the paper is fed forward at a speed greater than that at which the cylinder is rotated when being positioned thereon, and belts engaging said impression-cylinder and said former feed-roller, substantially as set forth.

7. In a printing-press, means for positioning the paper or the like to be printed, comprising a fixed stop, a movable tongue or bar

adapted to cooperate therewith, a guide bar or plate, and a plate-spring carried by said guide bar or plate and in contact with said tongue with which it is designed to move, whereby when the article to be printed is fed between the said tongue and plate-spring, and into contact with the stop a retrograde movement is prevented, substantially as set forth.

8. In a printing-press means for regulating or positioning the article to be printed while the cylinders of the press are being rotated, consisting of the stop or stops located on the surface of one of the cylinders of the press, and means for passing the article to be printed up to said stops at a speed greater than the speed of rotation of said cylinder, substantially as set forth.

9. A printing-press having a rotary impression-cylinder and mechanism for causing the paper to travel at a greater speed than that at which the cylinder is rotated and positioning or registering paper on said cylinder while the latter is being rotated, the said mechanism comprising a feed-roller of varying diameter operated by said cylinder, a stop for arresting the movement of the paper, means for holding the paper against said stop, a guide bar or plate, a second feed-roller, and means for periodically elevating said guide-bar and said latter roller, the latter being thrown into contact with the maximum circumferential portion of said former feed-roller, whereby the paper is fed to said impression-cylinder at a speed greater than the speed of rotation of the latter, substantially as set forth.

10. In a printing-press, the combination with the rotary impression-cylinder, of a feed-roller mounted in contact with said cylinder, spools in rear of said cylinder, tapes or bands passing over said spools and feed-roller and over said impression-cylinder, a second feed-roller, a guide-bar located thereover, means for holding the paper or the like while passing over said guide-bar, and means for elevating said second feed-roller into engagement with said former feed-roller, substantially as set forth.

11. In a printing-press, the combination with the rotary impression-cylinder, of the feed-roller of varying diameter having a reduced portion and a peripheral flange in engagement with a corresponding flange of said impression-cylinder, a rear shaft having adjustable spools thereon, tapes passed around said spools and feed-roller, a rock-shaft designed to be periodically operated by said impression-cylinder, arms secured to said rock-shaft, a second feed-roller carried by said arms, a guide-bar also carried by said arms and having a plate spring or springs, a tongue or tongues secured to said shaft and against which said plate spring or springs bear, and a stop bar or bars in rear of said guide-bar and second feed-roller, substantially as set forth.

12. In a printing-press, the combination with the rotary impression-cylinder, of the feed-roller having a central reduced portion and a peripheral flange in engagement with
5 said impression-cylinder, a shaft in rear of said cylinder having adjustable spools thereon, tapes or bands passed around said spools and over said feed-roller, said tapes being in contact with said impression-cylinder in their
10 forward movement and out of contact when moving in reverse direction, a disk on one of the journals of said impression-cylinder having a peripheral shoulder, a rock-shaft having an arm engaging said disk, two arms de-
15 pending from said rock-shaft, the second feed-roller mounted in said depending arms, and designed to be revolved when thrown

into engagement with said former feed-roller, the guide bar or plate also carried by said depending arms, the plate-spring extending transversely over said bar or plate and free at one end, the tongue carried by said rock-shaft and against which said plate-spring is designed to bear, and the rigid stop-bar projecting in rear of said guide bar or plate, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHARLES G. HARRIS.

Witnesses:

W. H. SMILEY,
GEO. W. UPTON.