No. 661,245. Patented Nov. 6, 1900.

C. G. HARRIS & J. F. McNUTT.

PRINTING PRESS.

(Application filed Nov. 24, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

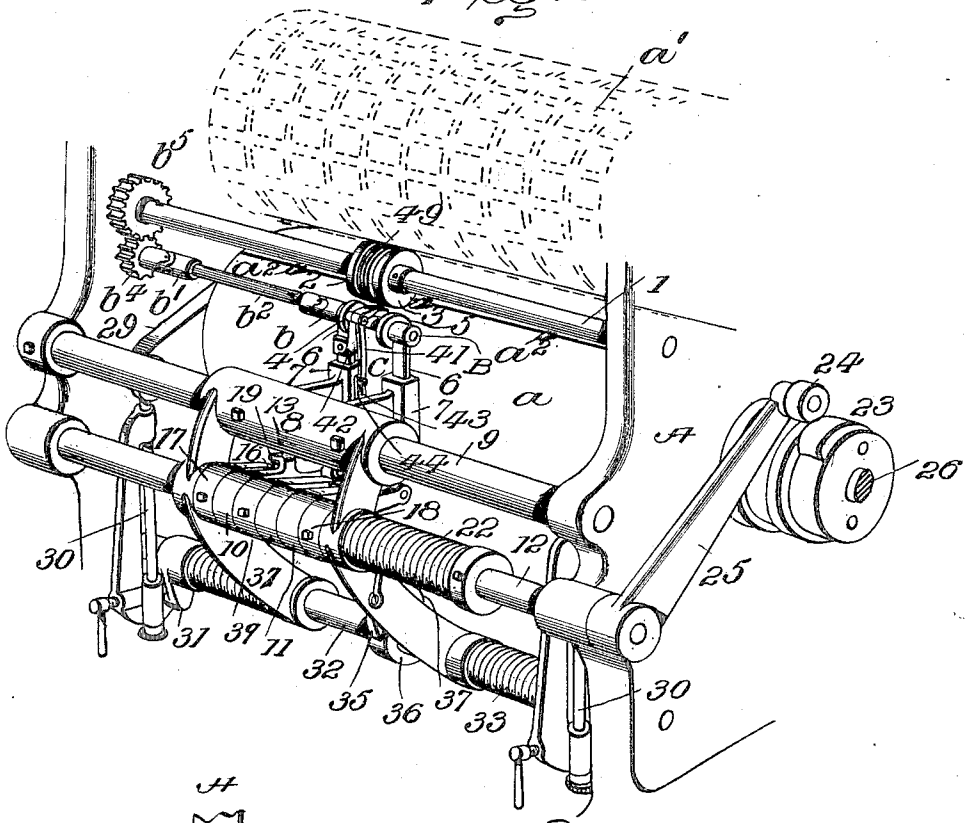
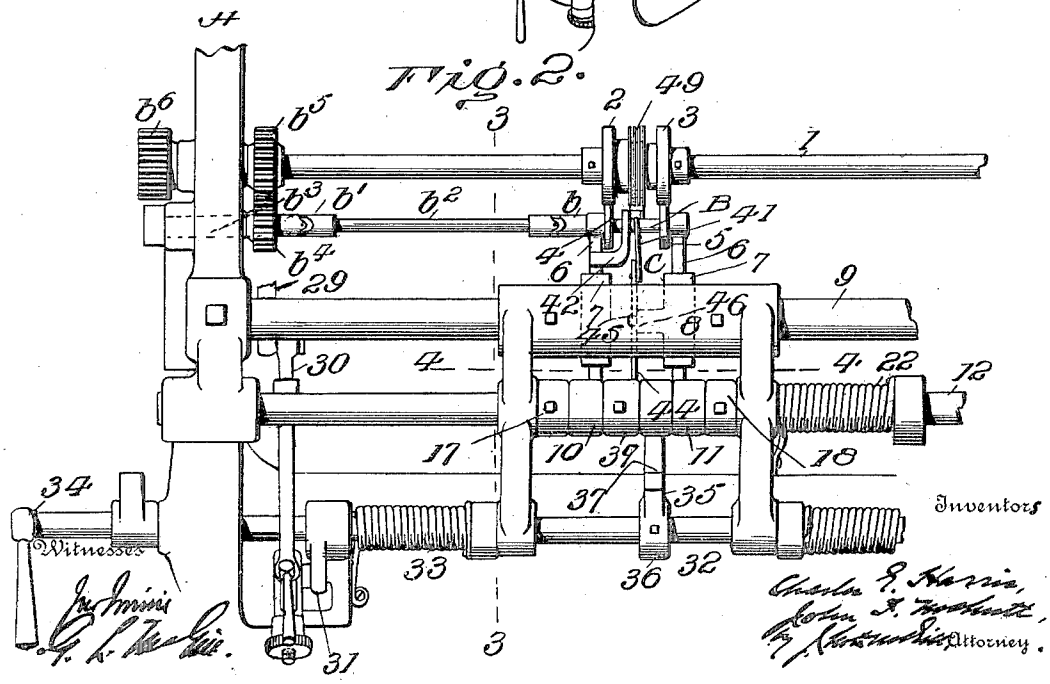


Fig. 2.



Witnesses:

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Fig. 3.

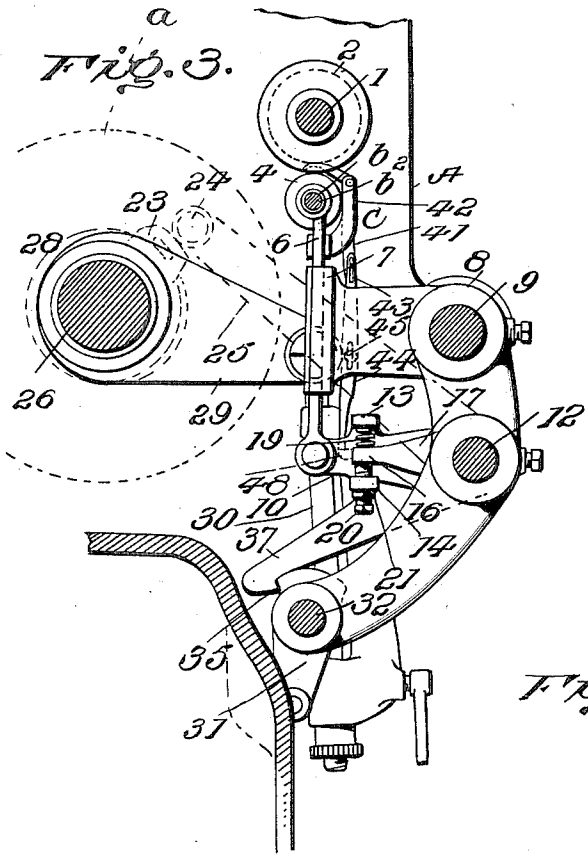


Fig. 5.

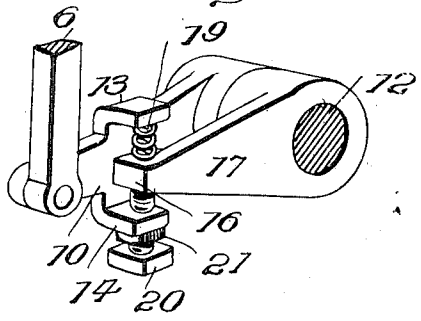


Fig. 6.

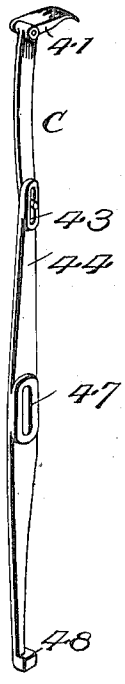
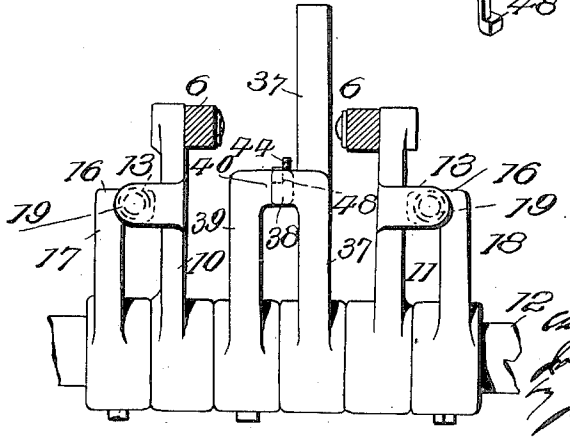


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES G. HARRIS, OF NILES, AND JOHN F. McNUTT, OF WARREN, OHIO, ASSIGNORS TO THE HARRIS AUTOMATIC PRESS COMPANY, OF NILES, OHIO.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 661,245, dated November 6, 1900.

Application filed November 24, 1899. Serial No. 738,170. (No model.)

To all whom it may concern:

Be it known that we, CHARLES G. HARRIS, of Niles, and JOHN F. McNUTT, of Warren, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Printing-Presses; and we 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 relates to printing-presses, and has special reference to means for automatically feeding the stock to a rapidly-rotated impression-cylinder and means for throwing such cylinder out of position in the event of failure or any irregularity in the feed-supply.

In Letters Patent Nos. 577,299 and 577,381, issued to Charles G. Harris on February 16, 1897, was shown and described means for imparting to the stock about to be printed upon an accelerated speed—that is, the stock is moved at a speed greater than the speed of rotation of the impression-cylinder until it registers with stops on the cylinder, whereupon the feed mechanism by which this accelerated speed is obtained ceases to act upon the stock.

In so far as the present improvements have reference to the inventions embraced by the patents above mentioned the object is to always insure uniformity of frictional engagement between the coacting feed-rolls—as, for instance, when paper entered between two coacting elements of the feed-rolls is of greater thickness than that between the other coacting elements the feed will be uniform. All the coacting elements of the feed-rolls are held in frictional engagement with the stock interposed between them notwithstanding any variance in thickness in stock.

The second part of the present improvement relates to means for throwing off the impression-cylinder in the event of failure or any irregularity in feeding the stock to the feed-rolls. This part of the invention is designed as an improvement upon the throw-off mechanism embraced by Letters Patent No. 577,405, issued to us on February 16, 1897; and its object is to simplify the construction, promote the efficiency, and insure accuracy of operation in the throw-off mechanism.

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 a portion of a printing-press, showing our present improvements. Fig. 2 is a front elevation. Fig. 3 is a vertical sectional view on line 3 3, Fig. 2. Fig. 4 is a horizontal sectional view on line 4 4, Fig. 2. Fig. 5 is a detail perspective view. Fig. 6 shows parts of the throw-off mechanism detached from the press.

In the two patents first before mentioned the means shown for obtaining what is commonly termed "overfeed of the stock" comprised two feed-rolls, between which stock was intermittently grasped and fed to the press at an accelerated speed. In Patent No. 577,299 one feed-roll was shown as being of uniform diameter and as designed to coact with rings or peripheral enlargements on the other feed-roll, while in Patent No. 577,381 both feed-rolls were shown as provided with rings or peripheral enlargements designed to intermittently coact in feeding the stock. In both instances both feed-rolls were extended across the machine and journaled at their ends, with the result that when two thicknesses of paper were entered between one set of coacting elements, as one ring of each roll and only one thickness between the other rings, the latter could not always act to feed the paper. Feed-rolls thus constructed require that the rings or peripheral enlargements be accurately ground to exact diameters in order to insure an even bearing upon the stock even when but a single sheet is being fed forward between both sets of coacting elements of the feed-rolls.

Referring to the drawings, A designates the frame of a printing-press; *a*, the impression-cylinder; *a'*, the type-carrying cylinder, (shown in dotted lines, Fig. 1,) and a^2 stops or grippers on cylinder *a*, up to and against which the stock is fed.

1 is the shaft, and 2 and 3 the rings, of the upper feed-rolls, such rings having hubs secured on the shaft adjacent to its center.

B designates the shaft, and 4 and 5 the rings, of the lower feed-rolls, which rings are designed to periodically coact with the rings 2 and 3, constituting the upper feed-rolls. These two feed-rolls are constantly operated, so that when they are in frictional engagement the stock between them will be fed forward and positioned or caused to register against the receding stops a^2 of the impression-cylinder while the latter is in motion, the speed of the feed-rolls being greater than the face speed of the cylinder. At its ends shaft B has its bearings in the upper ends of vertically-movable standards 6, which are passed through brackets 7 of a frame 8, supported by a cross-rod 9, mounted at its ends in the sides of frame A. At their lower ends the standards 6 are pivoted to the rear ends of arms 10 and 11, which latter are loosely fitted on a shaft 12, mounted in the sides of frame A. On each of these arms 10 and 11 are formed upper and lower laterally-projecting lugs 13 and 14, which extend above and below a lug 16, projecting laterally from arms 17 and 18, which are adjacent to arms 10 and 11. These arms 17 and 18 are shorter in length than arms 10 and 11 and are rigidly secured on shaft 12. Between the lugs 16 of arms 17 and 18 and the upper lugs 13 of arms 10 and 11 are interposed strong spiral springs 19, while in the lower lugs 14 are set-screws 20, which are adapted to be adjusted against the lug 16, so that they will just slightly clear such lugs, being secured in this position by jam-nuts 21. When the shaft 12 is partially rotated against the tension of its encircling spring 22 by the engagement of the raised portion of cam 23 with the roller 24 of the lever 25, the free ends of arms 10 and 11 will be in their highest position and through the action of the spiral springs 19 the lower feed-rolls 4 and 5 will be pressed against the upper feed-rolls 2 and 3. The screws 20 being properly adjusted, a firm contact of the two sets of feed-rolls is insured, and the resiliency of the springs 19 is utilized for any inequalities of stock between the feed-rolls. It will be observed that at the same time several thicknesses more of paper may be passed between one set of coacting rolls than between the other set and still the proper frictional engagement between both sets of rolls may be maintained. In this way we obtain a uniform advancement of the stock fed to the rolls. The cam 23, by which the partial rotation of shaft 12 is intermittently effected, is located upon the outer end of the shaft 26 of the impression-cylinder a. As this cam revolves and its raised portion frees the end of lever 25 such lever will be allowed to return to its normal position under the action of spring 22, carrying the lower feed-rolls, their shaft, and supports with it, thus leaving a space, preferably of about one-quarter of an inch, between the upper and lower feed-rolls. Upon one end of shaft B is secured one member b of a universal joint, which is connected to its complementary part b' by a short shaft b^2, said part b' being secured to a shaft b^3, carrying a pinion b^4, which is driven by a gear-wheel b^5 on shaft 1, which latter has on one end a pinion b^6, by which it is driven by suitable gearing of the press. (Not shown.) By means of this universal-joint connection between shafts B and b^3 the proper motion is transmitted to the lower feed-rolls and the surface speed of the coacting feed-rolls will be uniform.

The impression-cylinder shaft 26 is mounted in eccentrics 28, fitted in frame A in such manner that when arms 29 of said eccentrics are raised the shaft 26 is lowered after the manner shown and described in Letters Patent No. 577,405. To control the action of these eccentrics, the arms 29 are connected at their outer ends to rods 30, which latter are pivoted at their lower ends to cranks 31, fast on a spring-held shaft 32, mounted in frame A. To throw the impression-cylinder to its highest point, so that stock thereon will receive the impression of the type-forms of the type-carrying cylinder, the shaft 32 is turned, as against the tension of its springs 33, by means of a handle 34 until the shoulder 35 of the collar 36, fast on said shaft, is engaged by the hooked end of an arm 37. This arm is journaled loosely on shaft 12 and is provided with a laterally-projecting lug 38. Adjacent to arm 37 and fast on shaft 12 is an arm 39, which carries at its rear end a lug or block 40, which is overhung by the lug 38 of arm 37. If there be nothing interposed between the lugs 38 and 40, the arm 39 will not in the partial rotation of shaft 12 in any way act upon arm 37 and the hooked end of the latter will remain in engagement with the collar 36, retaining the impression-cylinder-controlling shaft 32 in its proper position.

In the patent last-before mentioned, No. 577,405, we showed and described an automatic device for effecting the tripping of the impression-cylinder-controlling shaft in the event of the absence or irregularity of position of stock between the feed-rolls. In the present instance this tripping device C comprises a feeler-lever 41, fulcrumed on bracket 42, carried by one of the standards 6 and engaging at its lower end the slot 43 of a lever 44, fulcrumed on a screw 45 to a boss 46 of one of the brackets 7, said screw 45 being passed through a slot 47 in lever 44. At its lower end lever 44 carries a lug 48, which is designed during the proper operation of the press to be intermittently moved into and out of the space between the lugs 38 and 40. The upper arm of the feeler-lever 41 is located beneath a grooved wheel 49 on shaft 1 intermediate of the feed-rolls 2 and 3. When stock is properly fed between the upper and lower feed-rolls, this arm of the feeler-lever when the tripping device C is elevated by the supporting-standard 6 is depressed upon coming in contact with the stock between the feed-rolls, causing said lever to act upon lever 44, so as to throw the

lug 48 thereof out of the space between lugs 38 and 40 of arms 37 and 39, respectively. This will prevent the swinging arm 39 from having any effect upon the hooked arm 37. If, however, there be no stock between the feed-rolls when they be brought into contact, then the upper arm of the feeler-lever (which is forked at its end) will move upwardly into the grooved wheel 49 without acting upon lever 44. The lug 48 being within the space between lugs 38 and 40 when the arm 39 is moved upward, it will effect the upward movement of arm 37 and its disengagement with collar 36, permitting the spring-impelled shaft 32 to effect the lowering of the impression-cylinder. When the lever 44 is thus not actuated by lever 41, it is free to be moved upward under the action of arm 39 by sliding on its fulcrum-screw 45.

The advantages of the present invention are apparent to those skilled in the art.

We claim as our invention—

1. In a printing-press having a rotary cylinder provided with stops on its periphery, means for feeding stock on said cylinder against said stops while the same is in motion, comprising two sets of feed-rolls, means for rotating the latter, and means for compensating for inequalities in the thickness of the stock as it is acted upon by said sets of feed-rolls, substantially as set forth.

2. In a printing-press having a rotary cylinder provided with stops on its periphery, means for feeding stock on said cylinder against said stops while the same is in motion, comprising two sets of feed-rolls, one of said sets of feed-rolls having yielding bearings, means for throwing the feed-rolls into and out of frictional engagement, and means for rotating both sets of feed-rolls, as set forth.

3. In a printing-press having a rotary cylinder provided with stops on its periphery, means for feeding stock on said cylinder against said stops while the same is in motion, comprising a set of feed-rolls fixedly supported, a second set of feed-rolls designed to intermittently coact with the former, a yielding support or bearing for said second set of feed-rolls, and means connected to both of said feed-rolls for rotating the same, substantially as set forth.

4. In a printing-press having a rotary cylinder provided with stops on its periphery, means for feeding stock on said cylinder against said stops while the same is in motion, comprising a shaft having fixed bearings and feed-rolls on said shaft, a second shaft and feed-rolls thereon for coacting with the former feed-rolls, yielding supports or bearings for said second shaft, means for intermittently placing said feed-rolls in frictional engagement, and means for rotating both of said shafts, substantially as set forth.

5. In a printing-press having a rotary cylinder provided with stops on its periphery, means for feeding stock on said cylinder against said stops while the same is in motion, comprising a shaft having fixed bearings and feed-rolls on said shaft, a second shaft having feed-rolls for coacting with the former feed-rolls, means for rotating both of said shafts, standards supporting said second shaft, means for raising and lowering said standards, and springs forming independent yielding bearings for said standards, substantially as set forth.

6. In a printing-press having a rotary impression-cylinder, means for positioning or registering stock on said cylinder while the latter is in motion, comprising a shaft having feed-rolls, a second shaft also having feed-rolls, pivotally-mounted bearings for said second shaft, an intermittently partially rotated shaft having arms, and springs interposed between said arms and bearings, as set forth.

7. In a printing-press having a rotary impression-cylinder, means for positioning or registering stock on said cylinder while the latter is in motion, comprising a shaft having feed-rolls, a second shaft also having feed-rolls, standards supporting said second shaft, an intermittently partially rotated shaft, arms loose thereon to which said standards are connected, arms fixed on said shaft, and springs interposed between the latter arms and those to which the standards are connected, substantially as set forth.

8. In a printing-press having a rotary impression-cylinder, means for positioning or registering stock on said cylinder while the latter is in motion, comprising a shaft having feed-rolls, a second shaft also having feed-rolls, standards supporting said second shaft, an intermittently partially rotated shaft, arms loose thereon to which said standards are connected, said arms having upper and lower lateral lugs, fixed arms on said shaft having lateral lugs projected between said upper and lower lugs, springs interposed between the lugs of the fixed arms and the upper lugs of said loose arms, and set-screws in the lower lugs of said loose arms, substantially as set forth.

9. In a printing-press having a rotary impression-cylinder, means for positioning or registering stock on said cylinder while the latter is in motion, comprising a shaft having fixed bearings, feed-rolls on said shaft, a second shaft having feed-rolls thereon, gearing operated by said first-mentioned shaft having a universal connection with said second shaft, and means for periodically placing the two sets of feed-rolls in frictional engagement, substantially as set forth.

10. The combination with the press-frame and a cylinder having stops thereon, of the upper and lower feed-rolls, said lower feed-rolls having a short shaft, standards supporting said shaft, a stationary frame having brackets through which said standards are passed, an intermittently-operated shaft having arms loose thereon connected to said

standards, a second set of arms fast on said shaft, both sets of arms having lateral lugs, and springs between the lugs of the fast and loose arms, substantially as set forth.

11. The combination with a printing-press having a shiftable impression-cylinder, and a shaft for shifting said cylinder having a shoulder thereon, of an intermittently-operated shaft, an arm loose on said shaft having a hooked end for engaging said shoulder and provided with a lateral lug, a second arm fast on said shaft movable toward and away from said lug, and a device having a feeler-lever designed to engage with the stock being fed to the press, and a second lever connected to the former lever having a lug designed to fit in the space between said second arm and the lug of the loose arm, substantially as set forth.

12. The combination with a printing-press having a shiftable impression-cylinder, and a shaft for shifting said cylinder, having a shoulder thereon, of an intermittently-operated shaft, an arm loose on said shaft and having a hooked end for engaging said shoulder, two sets of feed-rolls, one of which sets is raised and lowered by said intermittently-operated shaft, supports connecting said set of feed-rolls to said shaft, and a device carried by one of said supports having a feeler-lever located between said feed-rolls, and having a second lever connected to said former lever and designed to effect the disengagement of said hooked arm with said cylinder-shifting shaft in the event of any irregularity in the feed to the press, substantially as set forth.

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

CHARLES G. HARRIS.
JOHN F. McNUTT.

Witnesses:
JEAN KILPATRIC,
W. W. SMILEY.