

(No Model.)

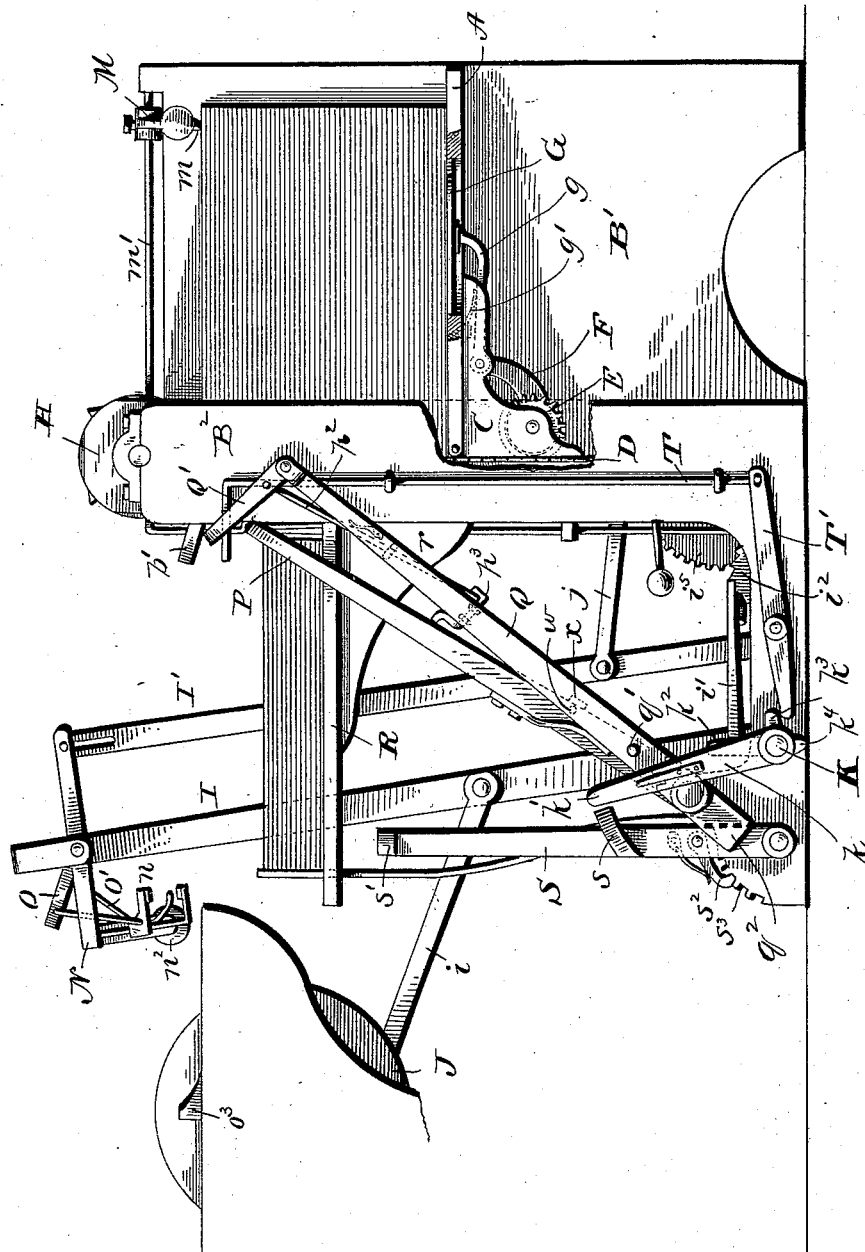
5 Sheets—Sheet 2.

B. F. BARNES & J. G. SMITH.
SHEET DELIVERING MECHANISM.

No. 524,126.

Patented Aug. 7, 1894.

Fig. 2.



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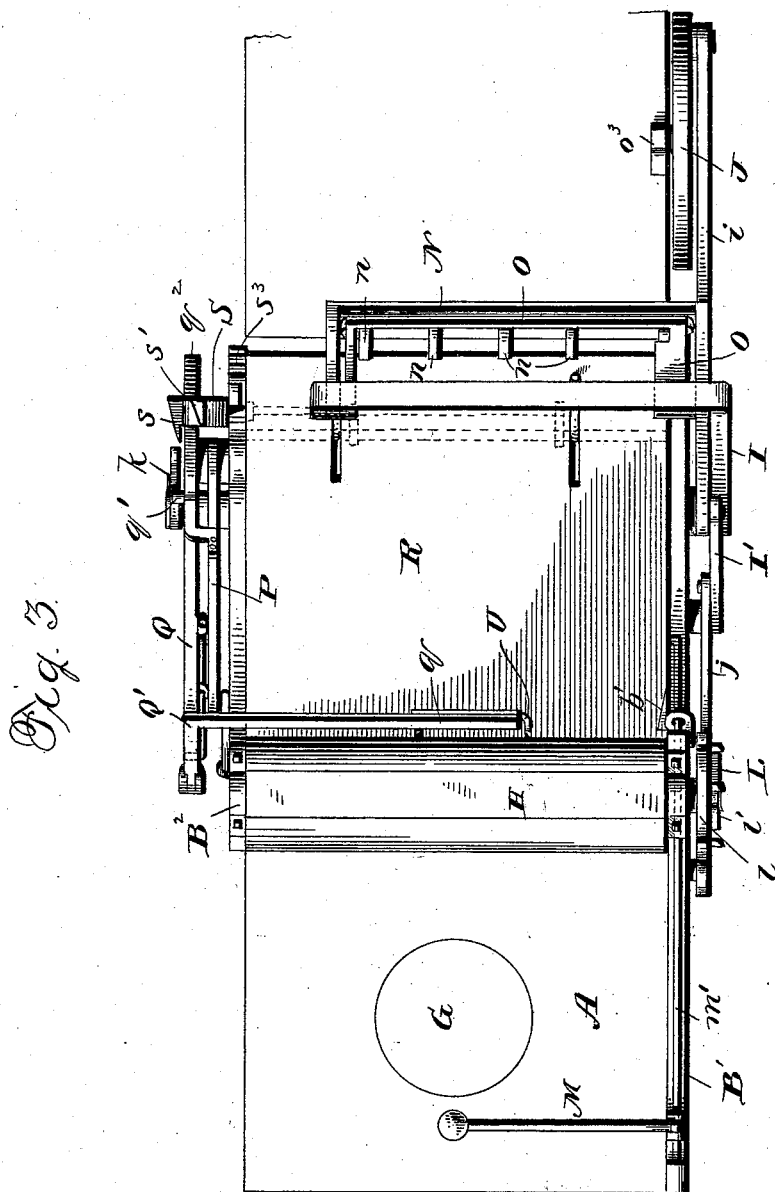
(No Model.)

5 Sheets—Sheet 3.

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Fig. 5.

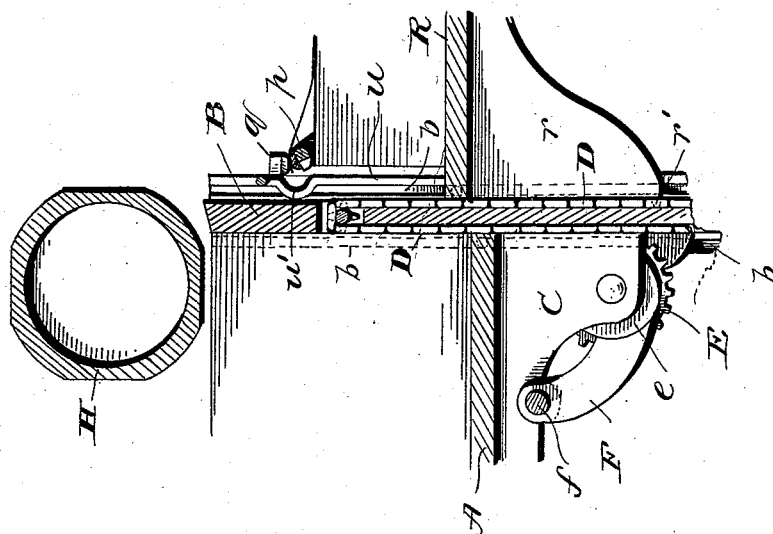
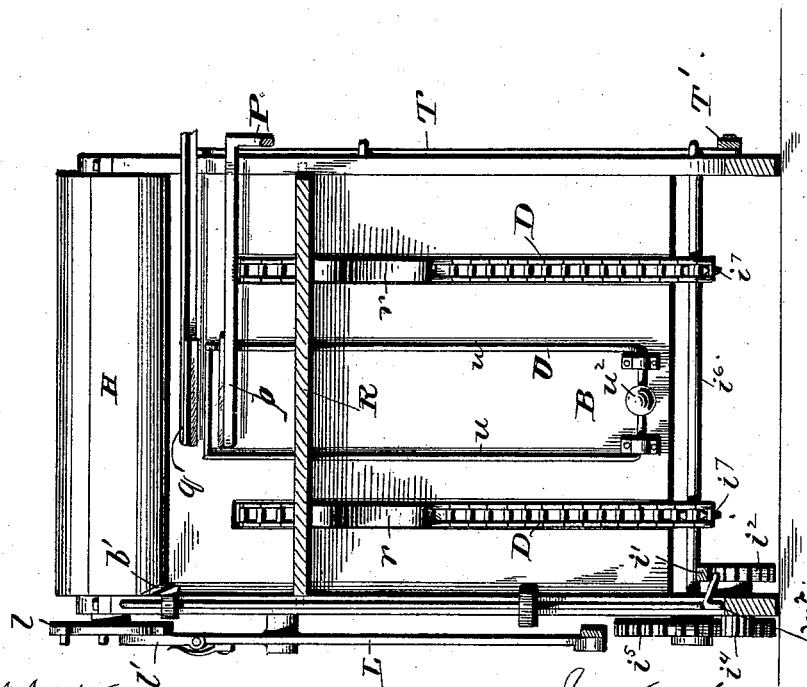


Fig. 4.



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5 Sheets—Sheet 5.

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Fig. 6.

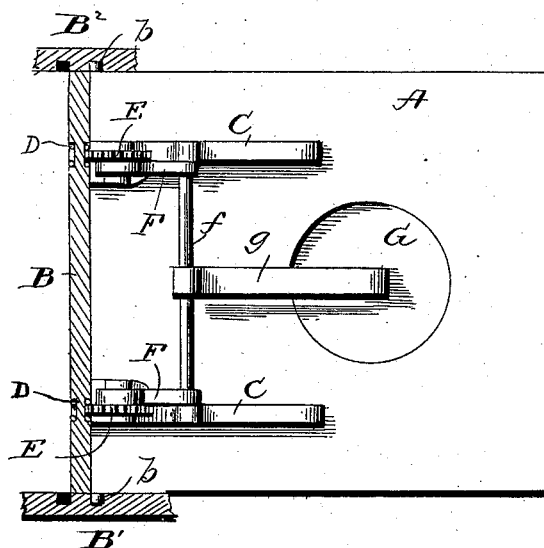


Fig. 7.

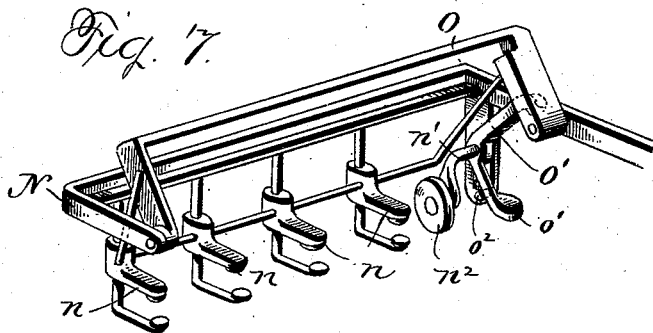


Fig. 8.

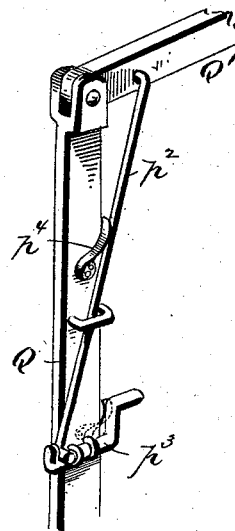
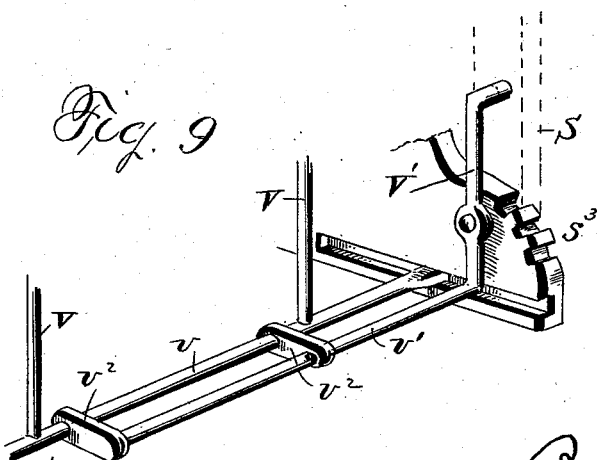


Fig. 9.



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UNITED STATES PATENT OFFICE.

BURR F. BARNES AND JACOB G. SMITH, OF CIRCLEVILLE, OHIO.

SHEET-DELIVERING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 524,126, dated August 7, 1894.

Application filed September 12, 1893. Serial No. 485,309. (No model.)

To all whom it may concern:

Be it known that we, BURR F. BARNES and JACOB G. SMITH, citizens of the United States, residing at Circleville, in the county of Pickaway and State of Ohio, have invented certain new and useful Improvements in Sheet-Delivering Mechanism; and we do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to mechanism for automatically placing blank paper on the platen of a printing press and for automatically removing the same when printed from the press, and it has for its object the provision of a simpler and more efficient apparatus of this character. More especially the design has been to improve the construction shown and claimed in the joint application of B. F. Barnes and J. G. Smith Serial No. 449,682.

The present invention consists in the mechanism having the construction and combination of parts hereinafter specified.

In the drawings, Figures 1 and 2 are views from opposite sides of the invention; Fig. 3 a plan thereof; Fig. 4 an end view, with parts cut off. Figs. 5, 6, 7, 8 and 9 are detail views.

Generally speaking the invention comprises a table for holding blank paper that is automatically raised as a sheet at a time is removed, mechanism for starting a sheet from the pile, mechanism for gripping and carrying the sheet to the press, removing mechanism, and table for receiving the printed paper that is automatically lowered as a sheet at a time is deposited thereon.

The blank paper holding table A is preferably rectangular in shape and moves in a frame consisting of an end B and a side B' so that only the corresponding end and sides of the table are inclosed. At its end adjacent to the end B of the frame, the table has two projections or pintles, one on each side, which engage each a vertical groove *b* in the side B' and a like groove in an upright B², and to the under side of the table at such end are attached two angle shaped brackets

C, C whose vertical sides adjoin the end B. Upward movement is imparted to the table by two sprocket chains D, D that are placed in vertical grooves in the two faces of the end B so as to be flush with such faces, and which are moved by means hereinafter described. The table is connected frictionally with these chains so as to allow the movement of the table to be checked when it is being fed up too rapidly without checking the movement of the chains. The connections for this purpose consist of a sprocket wheel E pivoted to each bracket, so as to mesh each with a chain, and an arm F having one end frictionally engaging with a hub *e* on the wheel and its other end attached to a rock shaft *f* journaled at its ends in the brackets. The arms F are caused to press against the hubs *e* with sufficient force under normal conditions to prevent the wheels from revolving and thus lock them to the chains, by means of a flat plate G placed in an opening through the center of table A and connected by a bar *g* with the shaft *f* so that on being depressed when paper is piled upon it it will rock the shaft and thus press the arms F against the hubs *e*. A spring *g'* attached to the under side of the table bears upon arm *g* to supplement the weight of the paper.

Instead of employing two separate wheels to feed a sheet from the pile of paper, as in the application referred to, a long roller H extending the entire width of the table is employed. This roller has the same peripheral form as said wheels and operates in precisely the same manner as they. By its substitution for the wheel, however, a greater bearing surface is secured and there is no necessity for adjustment when different sizes of paper are employed. If the table A is being raised too rapidly the resistance offered by the roller H will serve to cause the rotation of the wheels E by the chains, and thus prevent movement of the table.

The rotation of the feed roller and the movement of the sprocket chains are both effected by suitable connections with a swinging arm or bar I that is connected with the press-wheel J by a pitman *i* so as to move synchronously with the press. Said arm is keyed at its lower end to a shaft K that is journaled in the ends of extensions from the frame side B'

and the upright B², and a short distance above the shaft has attached a pawl *i'* whose end is adapted to engage and rotate, step by step, a ratchet wheel *i*² on a shaft *i*³, and thus through a pinion *i*⁴ on the shaft *i*³ and a gear wheel *i*⁵ meshing with the pinion, rotate a shaft *i*⁶ to which the wheel *i*⁵ is keyed and which carries sprocket wheels *i*⁷ over which the chains D, D, are passed. A second arm or lever I' pivoted to the extension of the frame side B', and connected at its upper end to the bar I is connected near its lower end by a link *j* to a lever L pivoted to the frame side B', and adapted at its upper end to engage a wheel *l* on the shaft of roller H precisely like the wheel employed for a like purpose in the application referred to, and rotate said wheel step by step. The wheel engaging part of the lever L is a spring-pressed pivoted arm *l'* of well known form adapted to slip over the pins of the wheel on its backward movement.

To prevent more than one sheet of blank paper being moved from the pile by the roller H, the upper edge of the end B is beveled as shown and in connection therewith a weighted pivoted arm M is employed having a finger or point *m* resting upon the paper, and tending to retard its withdrawal. This arm is also utilized to wholly stop the upward feed of the paper by pivoting it upon a shaft *m'* running lengthwise of the frame side B' and having a downward extension whose lower end *m*² is inclined and is adapted to be swung horizontally by the rocking of the shaft *m'*, when the arm M is engaged and lifted by the paper, and to pass under the pawl *i'* and lift it clear of the ratchet wheel.

The arm M is made adjustable along the shaft to adapt it for use with different sized paper.

The arm I at its upper end carries the blank paper gripping mechanism, and moves the latter to and from the press. Said mechanism consists of several L-shaped bars whose vertical members are attached to a light frame N that is pivoted to the arm I, and gripping blocks *n* mounted one each on said vertical members and connected together and to a pivoted frame O whose pivot is the same as that of the frame N. The blocks *n* which are padded on their under sides are movable to and from the horizontal members of the L-shaped bars, to grip and release the sheet of paper.

The movement of the frame O, and that of the blocks, is controlled by a pivoted arm O' that at one end engages one side of the frame and when moved in one direction raises the same, while when moved in the reverse direction it permits said frame to drop. The arm O' is locked to hold the frame raised by having its member *o'* engaged by a catch *o*² and it is released from this catch when the mechanism is ready to grip a blank sheet at the table by means of a cam *b'* attached to the frame end B that engages the member *o'* and moves it from the catch, said member being made springy to permit such disengage-

ment as well as to cause it to engage with the catch at the proper time. When the paper is carried to the proper place on the press platen it is released by a reverse movement of the arm *o'* which thus raises the frame N and blocks *n*. This reverse movement is caused by a cam *o*³ on the press platen which engages the member *o'* and swings the arm thereby, the arm being carried far enough to cause said member to engage the catch *o*² and thus hold the grip open for its return for another blank sheet.

In order to move the gripping devices in a plane parallel with the platen of the press, notwithstanding the circular motion of the arm I, the frame N is provided with a depending arm *n'* carrying a roller *n*², which on striking the press will move the grippers in the desired straight line. The connection between the arms I and I' is preferably an extension of the frame N and in view of the swinging motion of the latter the arm I' is slotted as shown.

For removing a printed sheet from the press two arms P and Q are pivoted at their lower ends to the end of the extension of the upright B², one P having a horizontal extension *p* at its upper end and the other a pivoted arm Q' having a horizontal extension *q*. The printed paper is gripped between the extensions *p* and *q*.

When operating to take a sheet from the press, the arms P and Q are moved thereto together until the extension *p* strikes the platen, whereupon the arm P will stop, while the other will continue until its extension *q* is carried to the proper point in a raised position over the printed sheet whereupon it will drop and engage the paper and upon the arm being moved backward, will by friction with the sheet draw it off the press until the extension *q* comes over the one *p*, whereupon the paper will be gripped between them and both arms then move together to carry the sheet to the receiving table R.

The movements of the levers from the table R to the press, and back are effected by the shaft K and while the blank paper mechanism is moving from the table A to the press, the parts being so timed in their motions that the printed paper carrying devices reach the press and have partly returned to the table R before the other mechanism reaches the press.

For moving the arms P and Q to the press the shaft K carries an arm *k* that is adapted to engage a pin or stud *q'* on the arm Q, said pin being so much nearer the pivot of the arm Q than the point of its engagement by the arm *k* from the shaft K as to result in a more rapid movement of the arm Q than the arm I. When arms P and Q are moved to the desired extent the arm *k* is disengaged from the pin *q'* by a cam *s* on an upright S which cam engages a spring pressed pivoted portion *k'* of the arm K and moves it sidewise. The return movement of arms P and Q is next

caused by a radial arm k^2 on shaft K striking an extension q^2 of the arm Q below the pivot of the latter.

When the paper has been carried to the table R it is released by first raising the pivoted arm Q' with its clamping extension q . This raising is done by a vertical rod or bar T having a horizontal part adapted to engage the extension q and move it upward, when the rod T is moved upward by means of a pivoted lever T' to which it is connected and which is rocked by a radial arm k^3 on the shaft K, on the backward rotation of the latter caused by the return of the arm I from the press.

When the extension q is raised the paper is dislodged from the extension p by the forward movement of a light, pivoted frame U, consisting of two vertical bars u, u , united at their top which, until the lifting of said extension q , was held against the front side of the end B. The extension p is notched in its upper edge, while one bar u is bent at u' to enable the frame to fall far enough across the extension p to move the paper off onto the table R. The frame U is pivoted at its lower ends to the end B, and has a weighted arm u^2 to cause it to automatically swing forward as described.

When the extension q of the arm Q' is raised it is held raised during its return to the press by a rod p^2 that is attached to the arm Q' at its upper end and on the lifting of said arm is raised high enough to have its lower end carried over a latch bar p^3 by a spring p^4 . On reaching its proper point over the press platen the arm Q' is released by the latch p^3 being engaged by a cam s' on the upper end of the upright S, which by moving said latch frees the locking rod q^2 . The upright S is made adjustable so as to vary the location of its cams S and S', and thus the place of engagement and consequent release of the arm k , of the shaft K and the arm Q' of the arm Q. For such adjustment it is pivoted at its lower end and has a locking dog s^2 that co-operates with locking notches s^3 in the extension of upright B².

The arm P is moved toward the press by the arm Q through a flat spring attached at one end to the former and bearing at its other end on the latter. This spring, when the arm P stops at the press allows the arm Q to continue its movement. On its return movement a pin w on the arm P, engages a projection x on the arm P, and the latter is then moved away from the press by the arm Q.

The table R is like table A provided with lugs to engage grooves in the side B and the upright B², and with brackets r . The engagement between the latter and the chains D, D, is merely by lugs or projections on their lower ends which enter the links of the chains.

To confine the paper on the table R two upright rods V, V are employed which rise from a cross bar v attached at its ends to the extensions of the side B' and the upright B². These

rods are made adjustable to adapt them to use with different sizes of paper, and their adjustment is preferably effected by making the bar v to slide in grooves in said extensions. Preferably the bar v is connected to the upright S by a pivoted arm V', having a horizontal extension v' connected by links v^2, v^2 to the cross bar v . Hence when the upright is adjusted the rods V will also be adjusted.

When it is desired to raise or lower the tables A and R it is merely necessary to disengage the wheels E in the former case and the bracket lugs in the latter from the chains D, D, by swinging them on their pintles and then move the tables by hand as desired.

The lowering of the rod or bar T is effected by means of a radial arm or lug k^3 on shaft K which engages the lever T oppositely to the lug k^2 on the reverse movement of shaft K.

Having thus described our invention, what we claim to be new, and desire to secure by Letters Patent, is—

1. In combination with the table the chain for moving the same, the wheel meshing with such chain and the frictional device for preventing rotation of the wheel, substantially as shown and described.

2. In combination with the table the chain for moving the same, the wheel meshing with the chain, and the pivoted arm bearing against a hub on said wheel to control its rotation, substantially as shown and described.

3. In combination with a printing press an endless carrier, the two tables connected to oppositely moving parts thereof, means to move paper from one table to the press, means to move the paper from the press to the other table, and connections between the press and the endless carrier substantially as shown and described.

4. In combination with a chain or chains a table engaging the same having pintles entering guides in a suitable frame on which it can be swung to disengage it from the chain or chains substantially as shown and described.

5. In combination the paper holding table, the arm to rest on the paper thereon, the rod or shaft to which said arm is connected, the table moving mechanism comprising in part, a pawl and a ratchet wheel, and a downward extension of the rod or shaft having a horizontally extending arm to engage the pawl and lift the same substantially as shown and described.

6. In combination the two paper holding tables, a sprocket chain to which each is connected, the swinging gripper carrying arm and connecting gearing between it and said chain, substantially as shown and described.

7. In combination, the pivoted arm carrying the blank paper gripping mechanism; the shaft to which it is secured the pivoted arm carrying the printed paper gripping mechanism, and two radial arms on the shaft to alternately engage the latter pivoted arm to move

it to and from the press, substantially as shown.

8. In combination the two pivoted arms having each a paper clamping extension, the extension of one being movable the spring connection between such arms enabling the stoppage of one at the press while the other continues its motion, means for stopping such one at the press the mechanism for holding the movable extension away from the other until the paper on the press is reached and means to cause the same to then move toward the press platen to catch the paper.

9. In combination the blank paper carrying mechanism, comprising in part a swinging arm, a shaft to which it is secured the printed paper carrying mechanism comprising in part a swinging arm, the arm as *k* on said shaft and adapted to engage the latter, and a means to disengage said arm *k* from the other arm at a predetermined point.

10. In combination the blank paper carrying mechanism, comprising in part a swing-

ing arm, the printed paper carrying mechanism comprising in part a swinging arm and gripping devices, the means for actuating the latter swinging arm from the former, and the adjustable cams to actuate the gripping devices, and disconnect the swinging arms, substantially as shown and described.

11. In combination with the blank paper carrying mechanism the printed paper carrying mechanism, means for moving the latter from the former, the adjustable cam mechanism to disconnect said carriers, the paper table the paper confining rods, and connections between the cam mechanism and the latter enabling both to be adjusted simultaneously, substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

BURR F. BARNES.

JACOB G. SMITH.

Witnesses:

M. A. SWEETMAN,

J. L. NEIBARGER.