

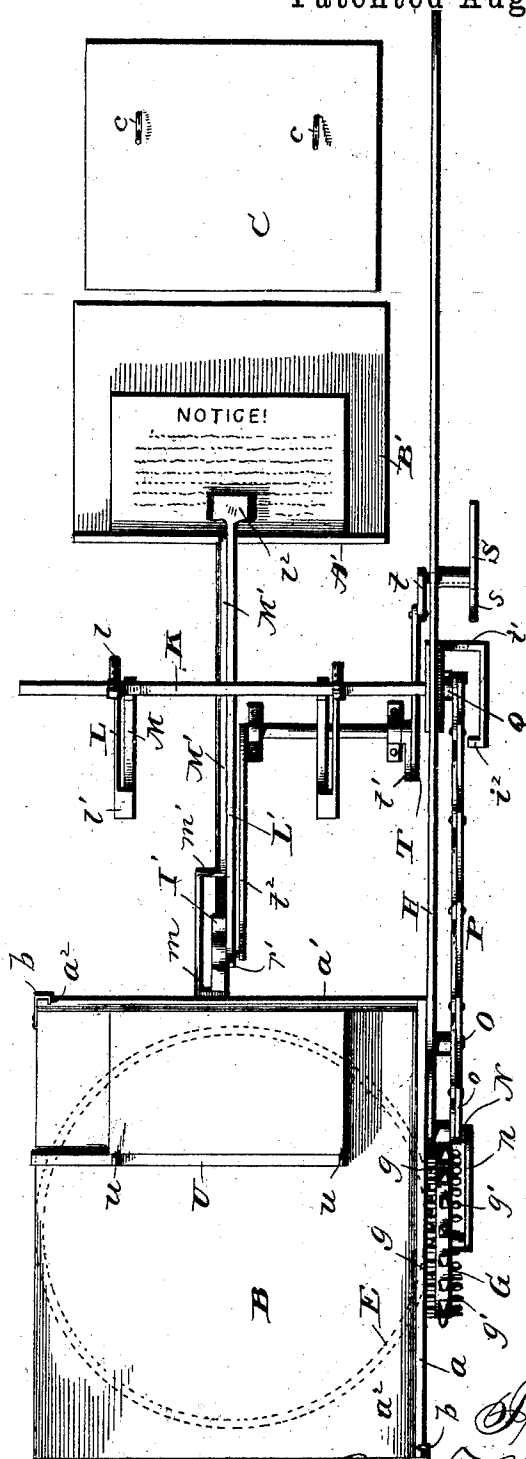
B. F. BARNES & J. G. SMITH.

SHEET FEEDING MECHANISM.

No. 503,275.

Patented Aug. 15, 1893.

Fig. 1.



Witnesses
C. Williamson
A. L. Hough.

Inventors
Barnes & Smith
Franklin H. Hough

(No Model.)

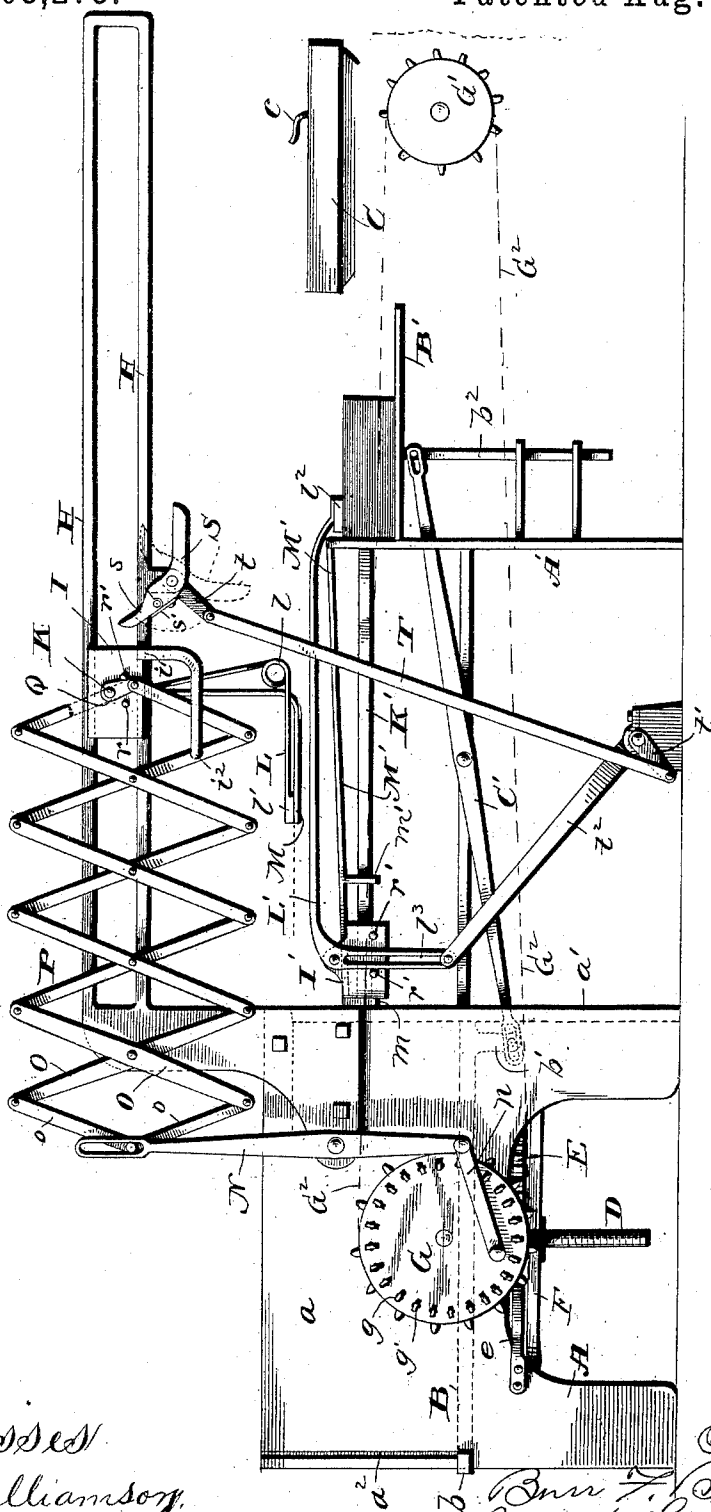
4 Sheets—Sheet 2.

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No. 503,275.

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4 Sheets—Sheet 3.

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Fig. 3.

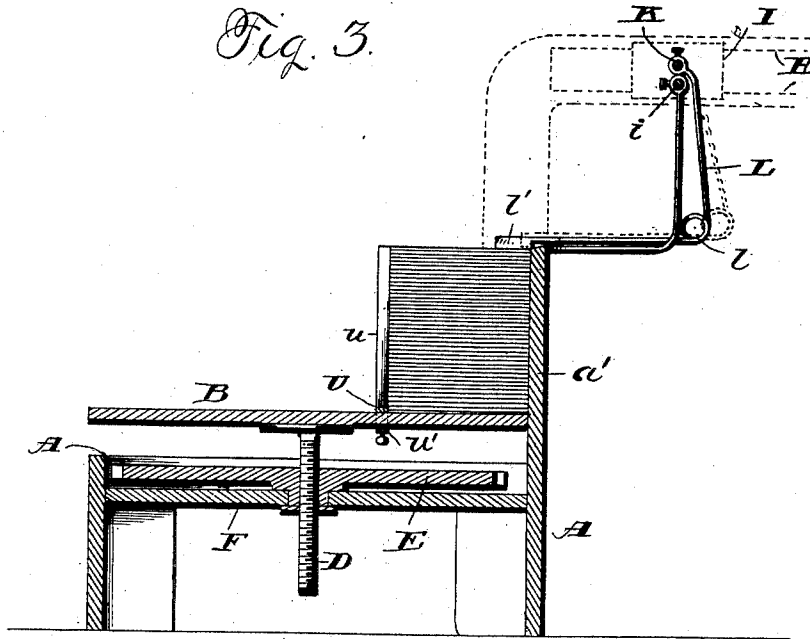


Fig. 4.

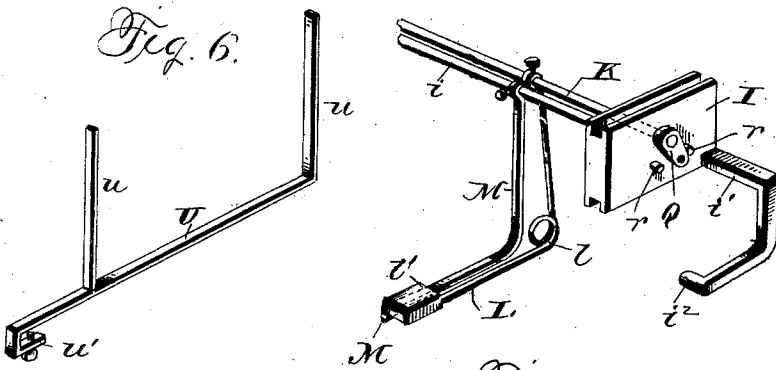


Fig. 6.

Fig. 5.

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4 Sheets—Sheet 4.

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Fig. 7.

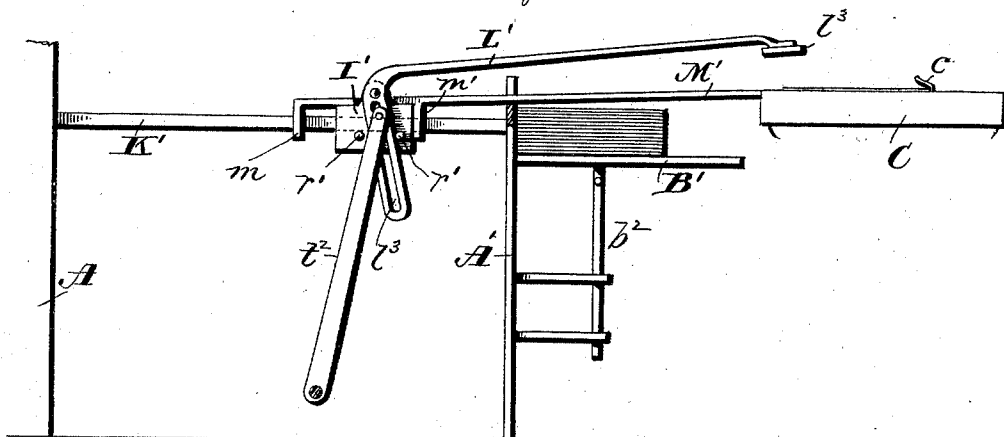


Fig. 8.

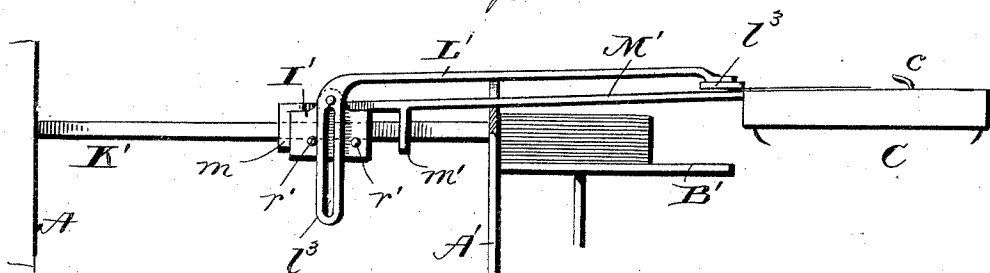
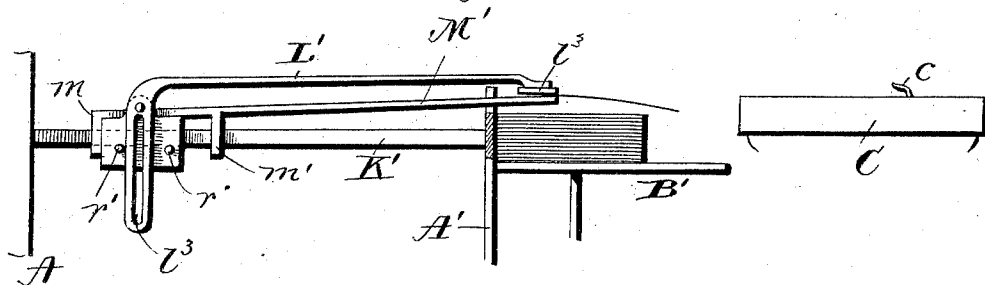


Fig. 9.



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UNITED STATES PATENT OFFICE.

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

SHEET-FEEDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 503,275, dated August 15, 1893.

Application filed June 18, 1892. Serial No. 437,128. (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-Feeding 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.

The object of our invention is to provide an automatically operated mechanism for feeding or delivering blank sheets of paper to a printing press, and removing the same when printed, and to this end said invention consists in the mechanism and the parts thereof constructed and combined substantially as hereinafter specified.

In the accompanying drawings, which form a part of this specification, Figure 1 is a plan view of our apparatus. Fig. 2, is a view in side elevation; Fig. 3 a longitudinal section; Fig. 4 a detail perspective view of the paper clamping and carrying mechanism of the feeding portion of the apparatus. Fig. 5 is a detail view showing a portion of our gear wheel having adjustable teeth; Fig. 6, a detail view of the holder to hold the paper on the table of the feeding mechanism. Fig. 7, is a detail view in elevation of the mechanism for carrying the printed sheet from the press, such mechanism being shown in position to engage the sheet upon the platen. Fig. 8, is a like view of the same mechanism after having clamped or gripped the sheet and partly removed it from the platen. Fig. 9, is a like view showing said mechanism almost at the limit of its motion from the press, and nearly ready to release the sheet of paper.

Referring to the details of the drawings by letter, A designates an open frame or support, rectangular in plan two sides of which a and a' are higher than the others. Movable up and down in this frame is a rectangular table or platform B, to hold the blank paper to be fed a sheet at a time to the platen C of a printing press. Said table is supported at its center upon a vertical screw D that passes

through the threaded center or nut of a gear wheel E, journaled horizontally in a suitable support F in such manner as to be incapable of vertical movement. The rotation of this wheel effects the raising and lowering of the table B through the screw D.

To rotate the gear E a wheel G is journaled on a horizontal shaft on the outside of the side a of the frame A, which wheel carries a series of pins g adapted to mesh with the teeth of the gear E. Each pin g is attached to the wheel G in such manner as to enable it to be arranged so that it will not mesh with the gear E, having for this purpose a screw threaded portion which passes through a threaded opening in the wheel G, and a head g' at the outer side of said wheel by which it may be turned. By adjusting these pins g in or out relative to gear E, it will be seen that said gear may be varied. The circumference of the wheel G is provided with sprocket teeth to enable said wheel to be connected by a sprocket chain G^2 , shown in dotted lines in Fig. 2, to a sprocket wheel G' on the printing press, so as to enable the raising of the table, to place the paper in position for the action of the paper carrying mechanism, to be effected at the proper time relative to the motion of the press. A suitable pawl or dog is provided to engage the teeth of the wheel E to prevent accidental reverse movement thereof. The pawl, of course can be disengaged from the wheel to permit its motion to be reversed.

Bolted to the side a of frame A, are two horizontally extending parallel arms H, H, which form tracks for a sliding block I that has grooves in its upper and lower edges to engage said arms. The outer ends of the two arms H, and H, extend to a point over the platen C of the press.

Passing through the block I and journaled thereby is a rock shaft K that extends to a distance on one side of the same equal to or somewhat greater than the width of the frame A. Secured to this shaft are two L-shaped arms L, having at their angles a coil l to render them somewhat elastic. The vertical member of each arm is the one by which it is attached to the shaft, while at the free end of the horizontal member, is a pad l' of rubber or the like material. Secured to a bar l ,

also supported by the slide block I and running parallel with the shaft K is a second L-shaped arm M, the free end of the horizontal member of which is adapted to co-operate with a pad l' to clamp a sheet of paper. Such sheet is held between the upper face of said member and the under face of the pad l' . The clamps L and M are adapted to be adjusted along the shaft and bar to accommodate paper of different widths.

The reciprocation of the slide block I is effected by the following mechanism: Pivoted to the side a of the frame A is a lever N that is connected at its lower end by a pitman n with the wheel G. The upper end of said lever is connected by links o and o with two levers O pivoted to the side of the frame A, on a common pivot and extending crosswise of each other. A lazy tongs P connects these levers O and O with the block I. The connection with the latter is not direct, however, but to a crank Q on the end of the shaft K outside the block I. The motion of the crank is limited by two pins r r on opposite sides of it. Thus arranged the first effect from moving the lazy tongs by the lever N is to rock the shaft K and raise or lower the pad l' from or to the horizontal member of the arm M according to whether the block is to move one way or the other. Then on one of the pins r being engaged by the crank arm, the movement of the slide block takes place. When the sheet of paper is to be carried to the press platen C, the slide is put at the inner limit of its motion with the horizontal member of the arm M abutting against the front face near its top of the frame side a' and the pad l' raised therefrom by the means just described, and extending over the pile of paper on the table B. The first movement to take place will be the rocking of the shaft K, and the arm L. This will cause the pad l' to first bear down on the top sheet of paper and then to draw it over the top edge of the frame side a' , whereupon it will clamp the paper against the horizontal member of the arm M. The outer pin r being now engaged, the slide will be moved outward carrying with it the sheet of paper held by the clamps. Before the slide reaches the outer limit of its motion the advance edge of the paper will be caught by the gage pins c on the platen, which as the slide continues onward, will result, in drawing the paper from between the clamps, and cause it to drop on the platen. The first effect of the return motion of the lazy tongs will be to raise the arm L and as it rises, from the horizontal member of the arm M, said member being slightly elastic, also rises sufficiently to clear the sheet of paper on its return movement for another sheet.

The top edge of the side a' of the frame A is made to incline upward and outward so as to obstruct the movement of the under sheets of paper as the top sheet is carried off by the pad l' as described.

The mechanism for removing a printed

sheet from the press is quite similar in many respects to the feeding mechanism. It has a rocking clamping lever L' pivoted to a sliding block I' that moves on a square rod or shaft K' , and a rod or bar M' with a pad l^2 on the outer end of said lever is adapted to co-operate. The movement of these parts is effected from the slide block I on its outward movement by the following mechanism:—Pivoted to the under guide arm H near its longitudinal center, is a lever S the arms of which stand at an obtuse angle to each other, one of which arms has an extension s pivoted to it by a rule joint and normally held in line with it by a spring s' . The pivot of this lever carries on its inner end a crank t , which is connected by a pitman T with a short crank t' attached to the shaft journaled in boxes on the floor. A second long crank l^2 is mounted on this shaft and has its outer end in engagement with a slot l^2 in the vertical arm of the clamping lever L' . On its outward paper carrying movement the slide block I engages by a laterally projecting arm i' , the upper arm s of the lever S and swings it to the position shown in dotted lines in Fig. 2. This through the cranks and pitman described first rocks the lever L' to raise the pad l^2 , its movement being limited by the forward pin r' on the block I' and then on the pin r' being engaged, causes the latter to slide outward on the shaft or bar K. The rod or bar M' is supported by and slides on the latter, being attached thereto by two collars m and m' , the former being in advance and the latter in the rear of the slide block I. After the latter has moved outward a short distance, the collar m' is engaged by it and the rod then carried along with it. The movement continues until the pad l^2 is carried to a point over the platen and the front end of the rod strikes against the edge thereof. By this time the block I has advanced far enough to cause a projection i^2 thereon to strike the other arm of the lever S and swing the latter to its former position (that shown in full lines). The effect of this, through the crank and pitman, is first to swing the lever L' and move its pad l^2 down upon the pointed sheet upon the platen C and then when the rear pin r' is engaged, move the same rearward and slide the sheet off the platen, whereupon it will rest upon the front end of rod M' being clamped by the pad l^2 , the said rod being up to this point stationary. The described movement of the lever L' being effected, the block I' strikes the rear collar m' so that block I' , lever L' and rod M' now move together away from the press carrying the printed sheet. Such sheet is deposited on a table B' and is removed from between pad l^2 and rod M by striking an upright A' through an opening in the top edge of which said rod is partially moved. The table B' is lowered simultaneously with the raising of the table B, the two being connected by a pivoted lever C'. The table B' is guided by a vertical stem b^2 that passes through guides

attached to the upright A'. When the slide block I returns from its outer position its projection *i* simply trips over the pivoted extension *s* of lever S without disturbing the latter otherwise.

For steadying and guiding the table B, guide lugs *b* are provided at diagonally opposite corners, which slide in vertical grooves *a*², formed in the edges of the frame sides *a* and *a'*. A holder U having vertical extensions *u* is adapted to be adjustably clamped to the table B by a clamping screw *u'* to hold the blank paper in place thereon against the frame side *a'*, in proper position relative to the sheet carrying devices.

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

1. In combination with a paper-support, the clamping device consisting of two arms one of which is stationary and one movable relative to the other, the rock-shaft carrying the movable arm, the mechanism connected with said shaft to rock it and to reciprocate said clamping device to and from the paper support, and stops to limit the rocking of the rock-shaft and thereby cause the reciprocation of the clamping device, substantially as shown and described.

2. In combination a paper support, the paper clamp comprising a stationary and movable member, the rock shaft carrying the latter, the crank on said shaft, the stop to engage the crank to limit the motion of the shaft, and the reciprocating mechanism connected to said crank.

3. In combination a paper support, the sheet clamp comprising a stationary and a movable member, the rock shaft carrying the latter, the slide block journaling said shaft, the crank on the latter, the stop pins for said crank, the vibratory lever and the lazy tongs between the latter and said crank.

4. In combination the sheet clamp, having a movable member, the rock shaft carrying the same the slide block journaling said shaft,

the crank on the latter the stop pins for the crank, the vibratory lever N connections between the latter and said crank the toothed wheel connected with said lever, the paper table and gearing between said wheel and the latter to raise the same, substantially as shown and described.

5. In combination with a paper-table, the toothed wheel E, a screw connecting these, the wheel G having pins to drive said wheel E, said pins being adapted to be rendered inactive, and means to rotate the wheel G, substantially as described.

6. In combination with the slide block, I, the projections *i'* and *i*² carried thereby, the pivoted lever S and the sheet carrying devices connected with the lever S.

7. In combination the pivoted clamping lever, as L', the slide block as I carrying the same, the guide for said block, the rod as M', having collars *m* and *m'* to be engaged by said block.

8. In combination, the vertically movable table to hold blank paper, the vertically movable table to receive printed paper, means for moving one of said tables, and connections between it and the other table, to move the latter by means of and in a reverse direction from the other table, substantially as described and for the purpose specified.

9. In combination the vertically movable table, to hold blank paper, the vertically movable table to receive printed paper, the mechanism to convey the paper from the former to a press and from said press to the latter table, and the lever connecting said tables, to cause them to simultaneously move in opposite directions.

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

BURR F. BARNES.
JACOB G. SMITH.

Witnesses:

I. B. BARNES,
FRANK BOWSER.