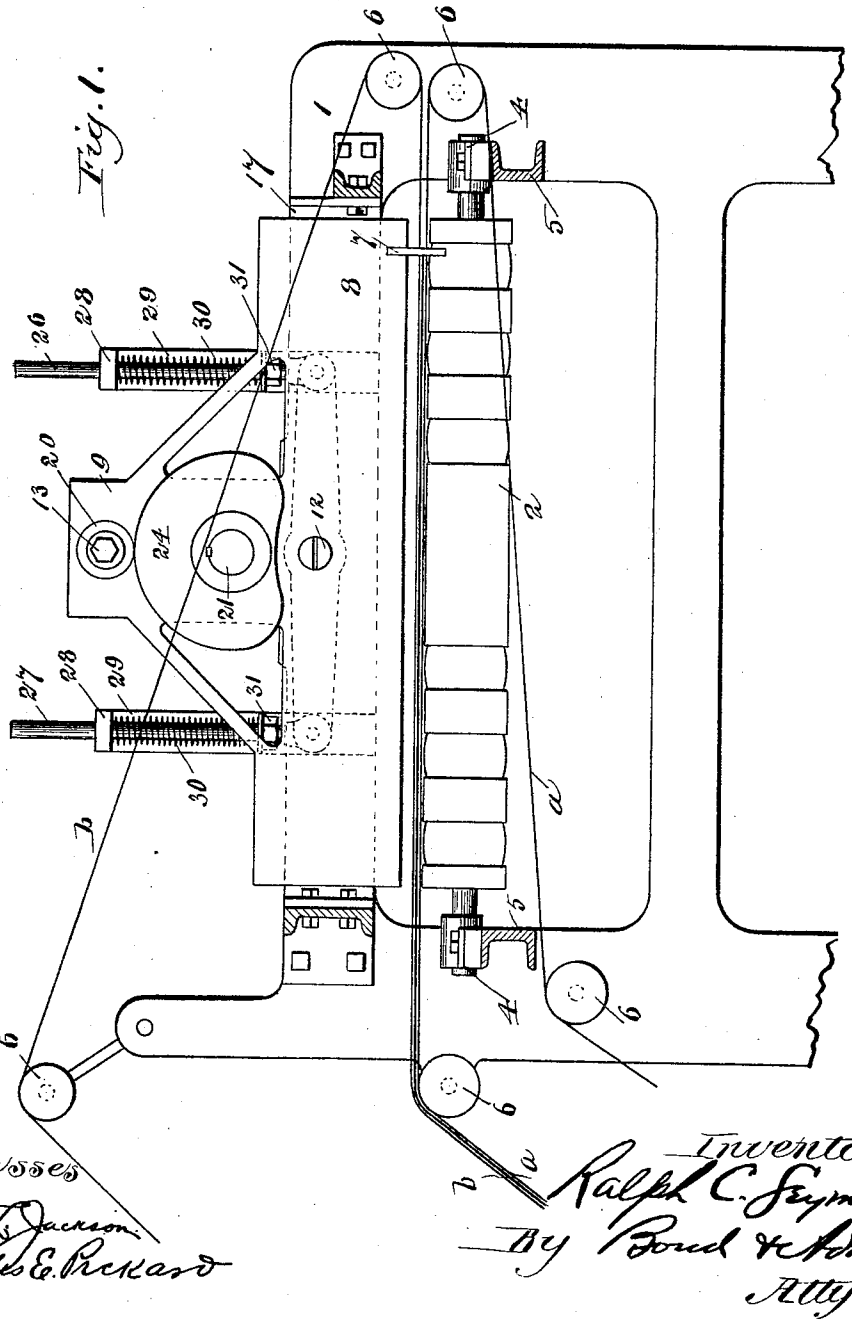
(No Model.) 3 Sheets—Sheet 1.

R. C. SEYMOUR.

FOLDING ATTACHMENT FOR PRINTING PRESSES.

No. 481,203. Patented Aug. 23, 1892.

Fig. 1.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

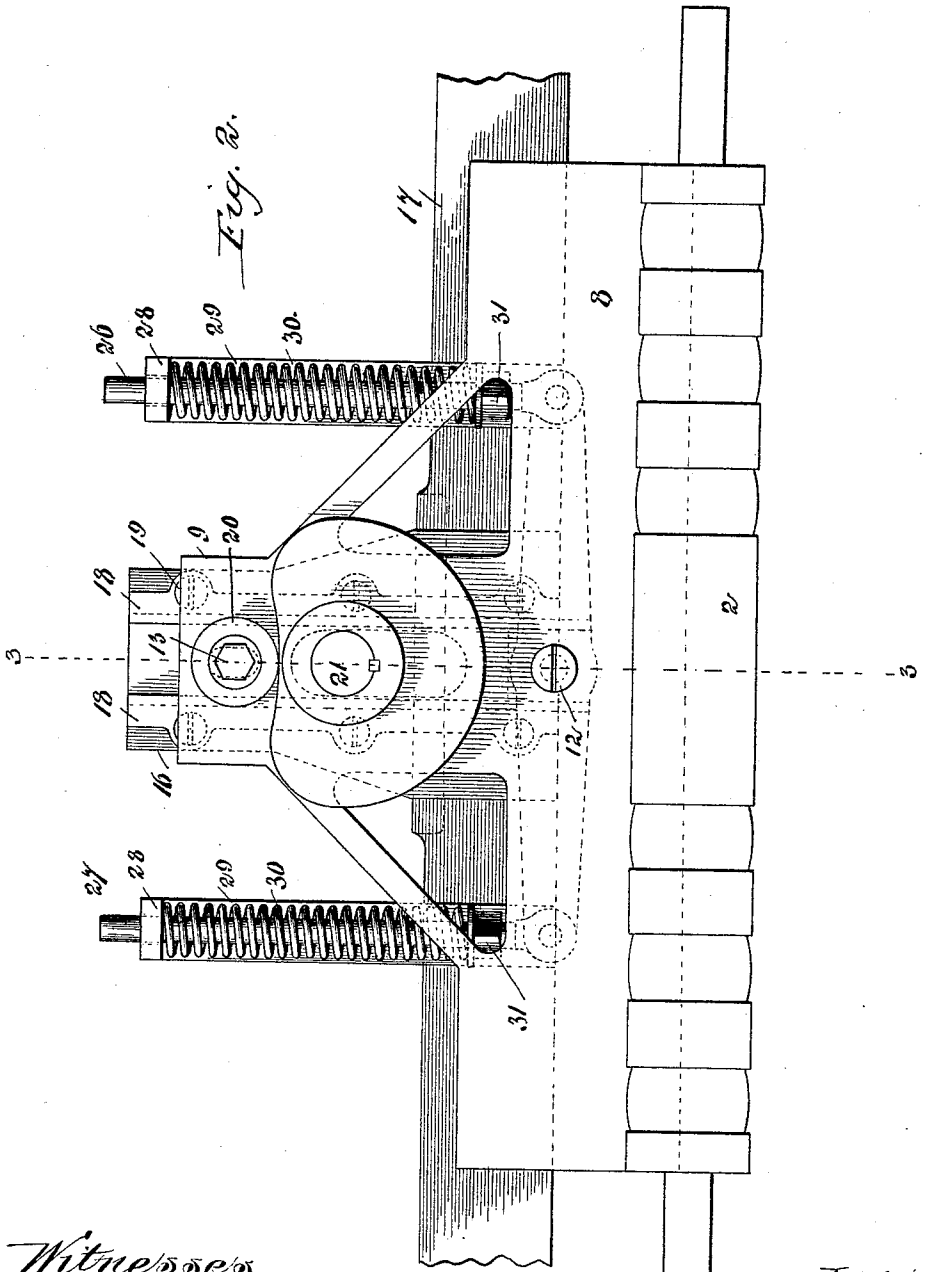

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Fig. 4.

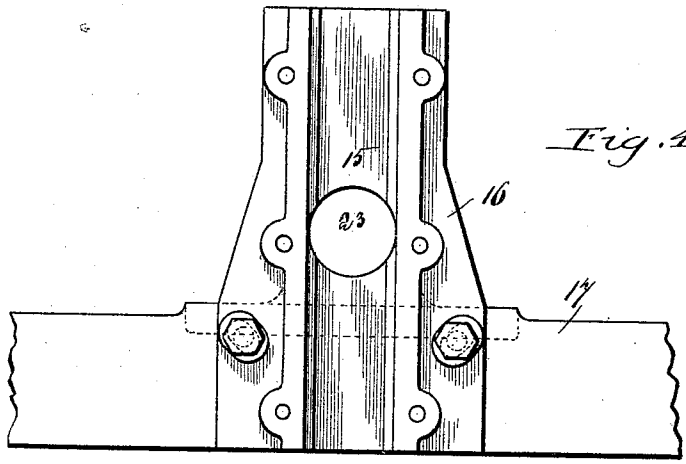


Fig. 5.

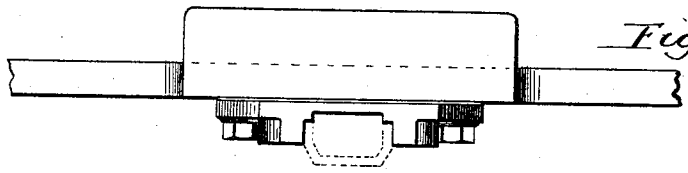
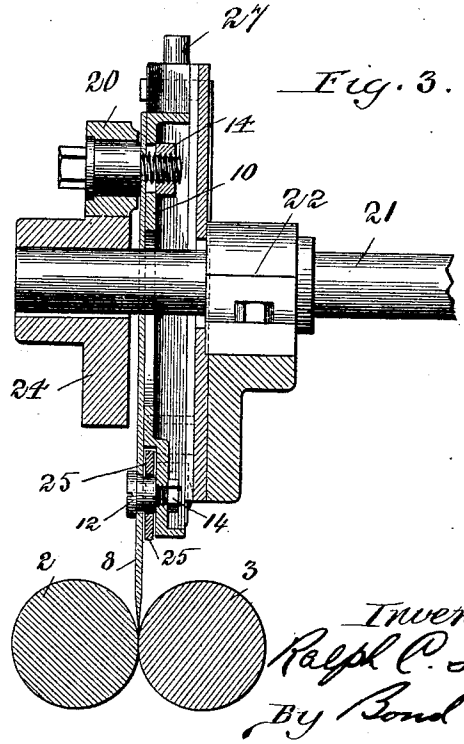


Fig. 6.

Fig. 3.



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UNITED STATES PATENT OFFICE.

RALPH C. SEYMOUR, OF CHICAGO, ILLINOIS.

FOLDING ATTACHMENT FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 481,203, dated August 23, 1892.

Application filed November 13, 1891. Serial No. 411,786. (No model.)

To all whom it may concern:

Be it known that I, RALPH C. SEYMOUR, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Folding Attachments for Printing-Presses, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the folding apparatus. Fig. 2 is a similar view, being an enlarged view of a portion of the folding apparatus. Fig. 3 is a vertical section on line 3 3 of Fig. 2. Fig. 4 is a detail, being a front elevation of the guideway. Fig. 5 is a top view of the same, and Fig. 6 is a front view of the sliding block which supports the folding-blade.

My invention relates to apparatus for folding paper, and more particularly to apparatus adapted to be used in connection with a web-printing press for folding paper after it has been severed into sheets.

The object of my invention is to provide a new and improved folding apparatus; and it consists in the parts and combination of parts hereinafter described.

I accomplish my object as hereinafter specified, and as illustrated in the drawings.

That which I deem to be new will be pointed out in the claims.

In the drawings, 1 indicates a frame on which the various parts are mounted, and which may be a portion of the printing-press or an independent frame.

2 and 3 indicate the folding-rollers, the ends of which are journaled in boxes 4, which are supported by cross-bars 5, secured in the sides of the frame. The rollers 2 and 3 are placed in close proximity to each other, and are adapted to be rotated in the usual manner and to carry tapes (not shown) for carrying off the paper after it has been folded by the action of the rollers.

6 indicates tape-rollers, which carry tapes *a* and *b*, which serve to carry the paper over the rollers 2 and 3 after it has been printed, and severed transversely. The rollers 2 and 3 are placed at such a distance from the frame 1 that the sheets of paper may be carried by the tapes and deposited centrally over the rollers 2 and 3.

7 indicates a plate, which extends across the frame 1 transversely and serves as a stop for the paper.

8 indicates a vertically-movable folding-blade, which may be of any suitable length, and is supported in a perpendicular position over the meeting-line of the rollers 2 and 3. The blade 8 is provided with an upward extension 9, which is adapted to be secured to a block 10, which is of the shape shown in Fig. 6, being provided with an elongated slot 11, and having its edges beveled, as shown. The blade is secured to said block by means of bolts 12 and 13, which pass through suitable eyes in the blade and block. The rear portion of the block is hollowed out, as best shown in Fig. 3, so that nuts 14 may be screwed upon the inner ends of the bolts 12 and 13 without interfering with the operation of said block. The block 10 is adapted to move in a vertical guideway 15, formed in a plate 16, which is rigidly secured to a bar 17. The bar 17 is supported upon the frame 1, and is located in such position that the various parts of the folding device will be supported in their proper positions and without interfering with the tapes. To secure the block 10 in the guideway 15, plates 18 are provided, which are adapted to be screwed upon the outer edges of the guideway after the block 10 has been placed therein in such manner that they will overlap a portion of the block, and thereby prevent it from becoming displaced. The plates 18 are secured in place, preferably, by means of screws 19, which construction permits of their ready removal.

20 indicates an antifriction roller, which is journaled upon the bolt 13, as best shown in Fig. 3.

21 indicates a shaft for operating the folding-blade, which shaft is driven by means of any suitable driving mechanism, which may be operated from the printing-press or may be independently driven. The shaft is journaled near one end in a bearing 22, as best shown in Fig. 3, and it extends through an aperture 23 in the plate 16, and through the slot 11 to a short distance beyond the folding-blade 8.

24 indicates a heart-shaped cam, which may be provided with a hub. It is keyed upon the outer end of the shaft 21 and is adapted

to bear against the roller 20. When the shaft 21 is rotated, the action of the cam 24 upon the roller 20 will lift the folding-blade, and it will be caused to reciprocate in a vertical plane. The position of the cam upon the shaft is so adjusted that the folding-blade will descend at a time when a sheet of paper is ready for folding. The blade will then force the paper downward between the meeting-lines of the rollers 2 and 3, when it will be caught by the rollers and folded. The weight of the folding-blade will not always be sufficient to properly feed the paper between the rollers 2 and 3, and to provide for a more perfect action of the folding-blade the following apparatus is provided:

25 indicates a bar, which is centrally mounted upon the bolt 12, between the blade 8 and the block 10, a suitable recess being provided in the block to permit of this arrangement.

26 and 27 indicate rods, which are hinged at their lower ends to the bar 25 and at their upper ends pass through bearings in blocks 28, supported by standards 29, as best shown in Figs. 1 and 2. Upon the rods 26 and 27 are mounted coiled springs 30, the upper ends of which bear against the blocks 28 and the lower ends against stops or nuts 31, placed upon the rods 26 and 27. The standards 29 are rigidly secured to the plate 17. By this construction when the folding-blade is moved upward by the action of the cam 24 the rods 26 and 27 will move upward in their bearings and the springs 30 will be compressed. After the cam has turned to such position as to permit of the downward motion of the folding-blade the springs 30 will act, together with gravity, to cause such blade to move downward with sufficient force to fold the paper. By this construction an elastic action of the folding-blade is secured, so that if, as is often the case, the folding-rollers become choked with paper, the action of the folding-blade will be modified by the action of the springs 30 and the blade will not bear upon the paper between the rollers with sufficient force to increase the choking. It has heretofore been common to force the folding-blade downward by the positive action of a cam; but by this construction the folding-blade is compelled to move the full length of its stroke at each revolution of the shaft, and therefore in case the folding-rollers become choked the mass of paper will be forced between the different sets of folding-rollers and all the folding mechanism will be clogged and danger of breakage will be incurred. In the construction shown herein if a full stroke of the folding-blade is prevented by choking or for any other reason the shaft 21 may continue to rotate without compelling the folding-blade to move to the lowermost point of its stroke, and in case of choke all the paper will not be forced between the folding-rollers, but will be accumulated upon the first rollers and may then be easily removed. The bar 25 will equalize the action of the springs 30, besides preventing friction or binding action by the rods 26 27, while the guide-block 10 will prevent the folding-blade from tipping endwise at either end.

The nuts 31 at the lower ends of the springs 30 are fitted upon screw-threads on the rods 26 and 27, so that they may be moved lengthwise of the rods to adjust the tension of the springs. Instead of mounting the nuts upon screw-threads, as shown, set-screws may be provided or the adjusting-nuts may be placed at the top of the rods 26 and 27; but I prefer the construction shown. By this construction the downward movement of the folding-blade may be regulated to suit the thickness or number of sheets of paper to be folded. More perfect action of the blade is thereby secured.

Additional rollers and blades for further folding the paper may be and are usually applied; but as the construction and operation would be similar to the folding mechanism above described, they are not shown or described.

That which I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with rollers 2 and 3, folding-blade 8, having an upward extension 9, an antifriction roller 20, journaled upon said extension, and a sliding block 10, secured to said folding-blade, of a guideway 15, adapted to receive said sliding block, shaft 21, cam 24, mounted upon said shaft and adapted to engage the roller 20, bar 25, secured to said folding-blade, perpendicular rods 26 and 27, carried by said bar, standards 29, supporting the upper ends of said rods, and springs 30 upon said rods, substantially as described.

2. The combination, with folding-rollers, of a vertically-movable folding-blade, vertical guides on which the blade moves, a cam for elevating the blade, springs for depressing the blade, and means for adjusting the tension of the springs, substantially as described.

3. The combination, with a vertically-reciprocating folding-blade, of mechanism for raising said blade and folding-rollers, bar 25, rods 26 and 27, carried thereby, springs 30 on said rods, and nuts 31 for adjusting the tension of said springs, substantially as described.

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