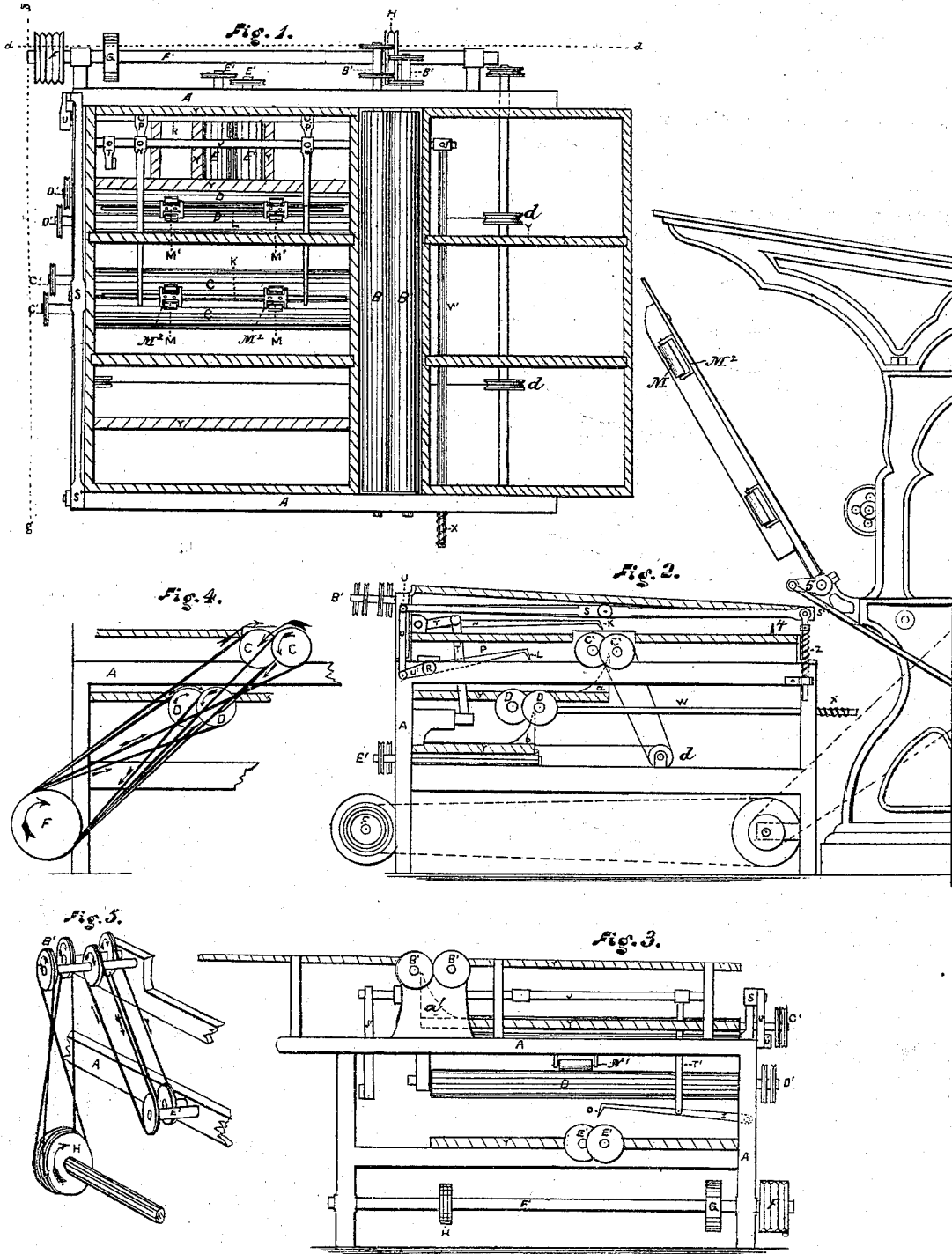


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Paper-Folding Attachments for Printing-Presses.

No. 147,568.

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IMPROVEMENT IN PAPER-FOLDING ATTACHMENTS FOR PRINTING-PRESSES.

Specification forming part of Letters Patent No. **147,568**, dated February 17, 1874; application filed February 9, 1874.

To all whom it may concern:

Be it known that I, JOSEPH B. MOLYNEAUX, of the city of Cleveland, county of Cuyahoga and State of Ohio, have invented a new and Improved Paper-Folding Attachment for Printing-Presses, of which the following is a specification:

The object of my invention is to construct and combine an improved folder or folding attachment with a cylinder printing-press, in such a simple and convenient manner that the operation of printing and folding shall be continuous and automatic after the paper has been fed into the press, thus dispensing with manual labor to feed the folder, and at the same time regulating its motion to correspond with that of the press.

In the accompanying drawings, Figure 1 represents a plan view of my folding attachment. Fig. 2 represents a side view of my folding attachment and a section of a press, showing the manner of combining the two and operating the attachment. Fig. 3 is an end view of the attachment. Figs. 4 and 5 are detail sections of Figs. 2 and 3, showing the manner of attaching the belts, their direction, when in operation, being indicated by the arrows.

The attachment takes the place usually occupied by the fly-table of the press, and is worked, wholly or partially, by the press, as illustrated in Fig. 2, the dotted lines in the lower portion of this figure indicating belt-gearing, which connects it with the press.

A represents the frame. B B are a pair of horizontal folding-rollers. C C are a like pair of folding-rollers placed at the center of and at right angles to rollers B B. D D are a like pair of folding-rollers placed below and parallel with rollers C C. E E are a like pair of folding-rollers placed below and at right angles to rollers D D. F is a series of grooved pulleys for running rollers D D and C C. *d* represents bands and pulleys, which are employed to carry the paper over rollers C C and E E. G is a driving-pulley on the main shaft F'. H is a pair of grooved pulleys, for running rollers B B and E E. J is a rock-shaft, to which are attached arms N and cranks T and J'. K is a folding-blade hung on arms N to rock-shaft J. L is a folding-blade hung on arms P to rock-shaft R. M and M' are pairs of friction-

rollers, attached, by means of brackets M², to all the folding-blades. These friction-rollers are adjusted so that their lower surfaces shall be a suitable distance above the plane of the edge of the blade, and strike the paper when the blade descends, and press it against the rollers. They prevent the blade from descending too far into the bite of the rollers, and, by pressing the paper against the rollers, they cause it to be drawn between them, even if the blade shall not have forced the fold into the bite. N' is a friction-roller, suspended in bearings from a cross-piece of the frame, so as to rest, by its gravity, on roller D, from contact with which it receives motion. The paper passes between it and roller D, and is carried by them to place over rollers D D to receive the third fold. O, Fig. 3, is a folding-blade hung to arm I. R is a rock-shaft, to which are attached arms P and crank U'. S is a lever, pivoted near the center, which gives motion to rock-shaft R through connecting-rod U and crank U', Fig. 2. T is a crank attached to rock-shaft J, and communicates motion, through connecting-rod T', to arm I, Fig. 3. U' is a crank attached to rock-shaft R, which gives motion to blade L through arms P. W is a slide-rod, connected, by crank J', to rock-shaft J, which gives motion to blade K through arms N, and to blade O, Fig. 3, through crank T, Fig. 1, connecting-rod T', Fig. 3, and arm I. X is a spiral spring on slide-rod W, serving to retract it, after it has been struck by the bed of the press, and raise blades K and O. Y is a slatted frame to support the paper. Z is a spiral spring attached to lever S, serving to raise the lever, after it has been struck down by crank S, and elevate blade L. *a* and *b*, Fig. 2, and *a'*, Fig. 3, are concave guides, which give the proper direction to the paper while passing between the rollers.

The operation of folding the paper is as follows: The sheet is laid on the folder by the fly of the press, Fig. 2, its center directly over rollers B B, and is started between them, to make the first fold, by a narrow blade provided with friction-rollers, as above set forth, attached to the center of the fly. It passes between rollers B B, and is conducted, by concave guide *a'* and bands *d*, over rollers C C to an ordinary adjustable guide-stop, 4, and is started be-

tween rollers C C, to make the second fold, by blade K and friction-rollers M M. This blade receives its motion, through arms N, rock-shaft J, crank J', and slide-rod W, from the bed of the press, which strikes the end of the slide-rod as it passes over the back center. As the sheet leaves rollers C C it is conducted, by concave guide *a* and friction-roller N', to place over rollers D D, and is forced between them, to receive its third fold, by blade L and friction-rollers M' M'. This blade is worked, through arms P, attached to rock-shaft R, crank U', connecting-rod U, and lever S, by the crank 5, Fig. 2, on the fly-shaft of the press, at the same instant the next sheet is laid on the folder by the fly of the press. The sheet then receives its fourth fold by being driven between rollers E E by blade O, Fig. 3, to which are attached friction-rollers, as above described. This blade receives its motion through arm I, Fig. 3, connecting-rod T', crank T, attached to rock-shaft J, which is worked, as above described, by slide-rod W at the time of making the second fold.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A folding-blade provided with friction-rollers, substantially as and for the purposes described.

2. In combination with roller D, the suspended friction-roller N', for advancing the sheet to place, as specified.

3. In combination with folding-blade K,

arms N, rock-shaft J, crank J', and slide-rod W, substantially as and for the purposes described.

4. In combination with blades K and O, crank T, connecting-rod T', rock-shaft J, and slide-rod W, substantially as and for the purposes described.

5. The combination of lever S, provided with spring Z, connecting-rod U, crank U', rock-shaft R, arms P, and folding-blade L, substantially as and for the purposes described.

6. In combination with rollers B B, the fly of a printing-press, having a folding-blade provided with friction-rollers, substantially as and for the purposes described.

7. The combination of slide-rod W with the bed of a printing-press, for the purpose of operating one or more folding-blades of a sheet-folding apparatus, substantially as set forth.

8. The combination of lever S with a crank, 5, on the fly-shaft of a printing-press, for the purpose of operating folding-blade K, substantially as set forth.

9. The combination of a sheet-folding apparatus with a printing-press, whereby the folding-blades are operated by the reciprocating bed or vibrating fly, and, together with the folding-rollers and other operating parts, are actuated in unison with the motion of the press, substantially as described.

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Witnesses:

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