

(No Model.)

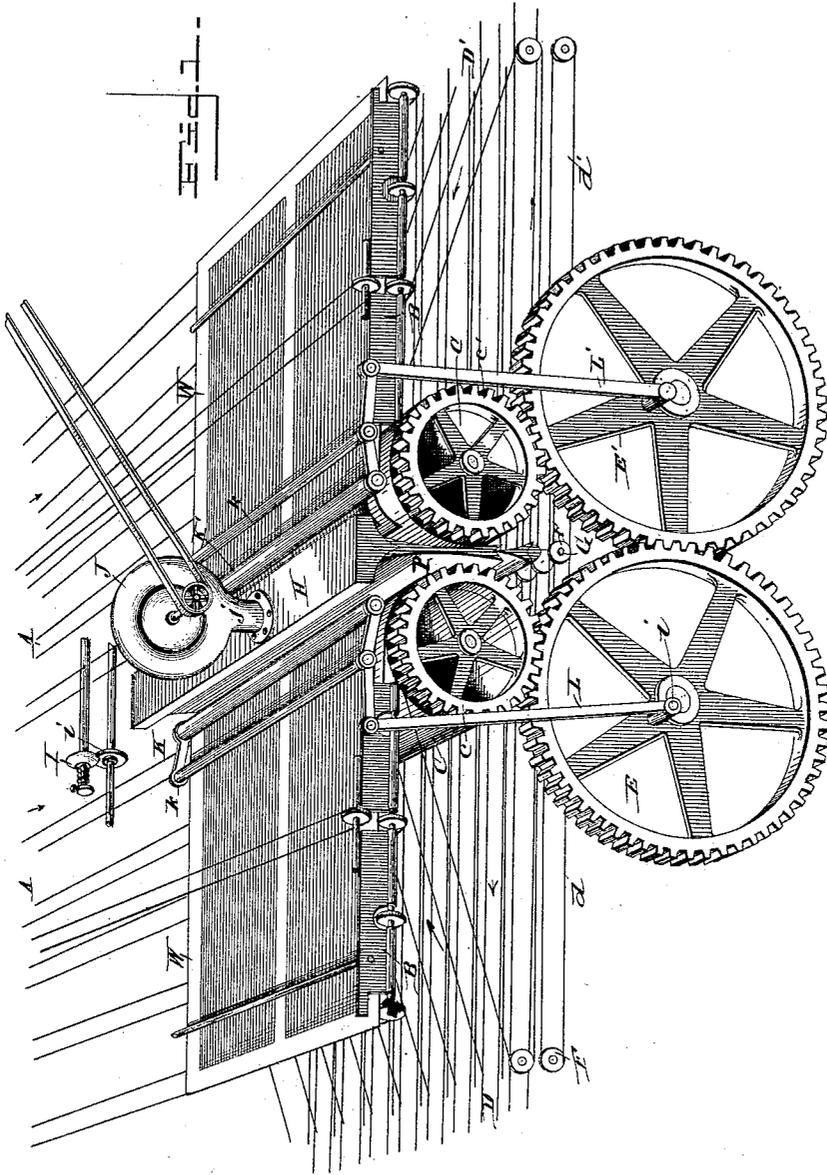
2 Sheets—Sheet 1.

J. L. COX.

PAPER SPLITTING AND FOLDING MACHINE.

No. 451,459.

Patented May 5, 1891.



WITNESSES

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INVENTOR

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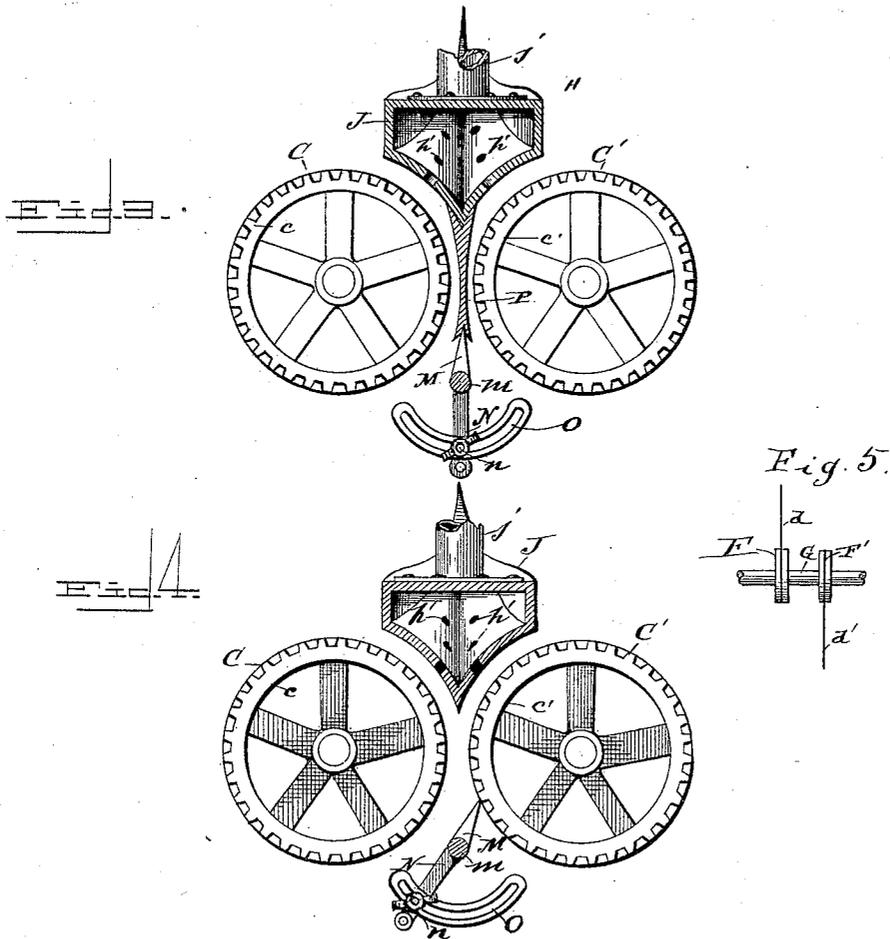
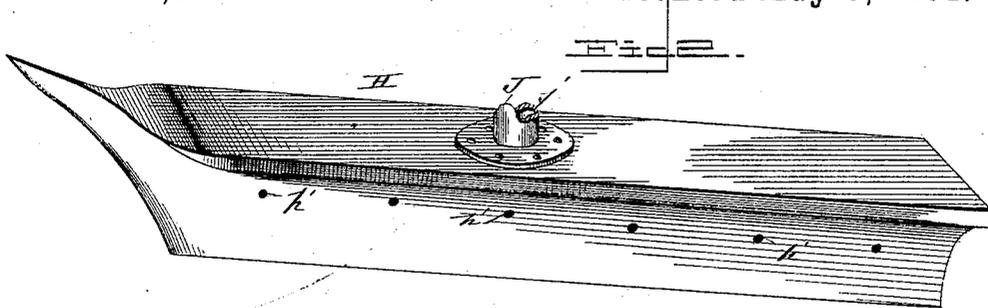
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UNITED STATES PATENT OFFICE.

JOSEPH L. COX, OF BATTLE CREEK, MICHIGAN, ASSIGNOR TO THE DUPLEX
PRINTING PRESS COMPANY, OF SAME PLACE.

PAPER SPLITTING AND FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 451,459, dated May 5, 1891.

Application filed November 1, 1889. Renewed October 2, 1890. Serial No. 366,828. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH L. COX, of Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Paper Splitting and Folding Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification, in which—

Figure 1 is a perspective view of a portion of a folding-machine, showing my invention applied thereto. Fig. 2 is a perspective view of the deflector. Fig. 3 is a transverse detail sectional view of the deflector and the main rollers, showing the parts adjusted for folding two folio sheets. Fig. 4 is a detail end view, part in section, showing the parts adjusted for folding a quarto sheet. Fig. 5 is a detail of the delivery-tapes.

This invention is an improvement in paper-folding machines especially designed for use in connection with newspaper or book printing presses wherein the printing is done on quarto sheets, the forms being made, if desired, to imprint on the quarto sheet duplicate matter for two four-page papers, or matter for one eight-page paper; and the object of the invention is to mechanically divide the quarto sheet and fold it as one eight-page paper or as two independent four-page papers; and to this end the invention consists in a novel combination of splitters for dividing the quarto sheet transversely, and in a pair of opposite folding tapes and rollers, and an automatic switch or deflector by which the halves of the sheet are directed into tapes at opposite sides of the machine to be directed into independent folding-machines, and in a switching mechanism by which both halves are directed together into one of these systems of folding-tapes to be folded together into the form of an eight-page paper, all of which will be clearly understood from the following description and claims.

In the drawings, A A represent delivery-tapes, which receive the printed sheets from the press (not shown) and bring them forward in the direction of the arrows until they

are stopped by guides B B, as shown, which extend transversely of the tapes.

C C' designate cylinders lying parallel with and below tapes A A and near the center thereof. The peripheries of these cylinders do not touch, however, and they revolve in opposite directions at right angles to the line of travel of the tapes A A. The cylinders C C' are driven by means of gears *c c'* on their outer ends, which mesh with driving-gears E E', which intermesh, and to which power is applied in any suitable manner from the main shaft or engine. (Not shown.)

D D are tapes running around cylinder C and out in a lateral direction, as indicated by the arrows, to a proper folding-machine, (not shown,) and D' D' are similar tapes running around cylinder C' and to a folder. (Not shown.)

d d are tapes coacting with tapes D D and running on pulleys F F on a shaft G, lying parallel with and below and between cylinders C C', and *d' d'* are similar tapes coacting with tapes D' D' and running over pulleys *f f* on shaft G, intermediate between pulleys F F. As the tapes *d d'* move in opposite directions, the pulleys F *f* must be loosely mounted on shaft G.

The mechanism for driving the several tapes referred to does not form part of my invention, nor do the folding-machines referred to, as any skilled mechanic could readily comprehend the nature of and practically adapt my invention to machines now in use.

Above and between cylinders C C' is a hollow pilot or deflector H, which is roughly triangular in cross-section, with its pointed edge extending down partly between the cylinders C C'. The inner edge of deflector H is preferably pointed or wedge-shaped, as at *h*, Fig. 2, so as to separate a sheet of paper brought forward by tapes A A which has been previously slit in its central line by means of slitters I *i*, mounted on proper shafts and located directly in front of the end of deflector H, as shown, in such position that a sheet of paper passing thereunder on tapes A A will be divided, as indicated.

Above deflector H is an air-blower J, the fan of which is driven by suitable belting

from a proper power, and this blower communicates with the hollow interior of deflector II by a short pipe, *j* to force air therein. The air escapes from the deflector through perforations *h' h'* in the sides thereof, which cause the air to jet outward and downward against the peripheries of cylinders *C C'*, as is evident.

K K' are rollers lying parallel with cylinders *C C'* at each side of deflector II and mounted in vibrating brackets or arms *k k'*, as shown, by rocking which rollers *K K'* can be thrown into or out of contact with the peripheries of cylinders *C C'*, respectively. The rollers are operated at the proper times by means of pitman-rods *L L'*, connected to arms *k k'* and to wrist-pins *l l'* on gears *E E'*, respectively. Below the deflector II and above shaft *G* is a hinged or rocking switch-blade *M*, which is mounted on an arm *N*, carrying a bolt *n*, engaging a slotted bracket *O*, secured to a proper fixed support, by which, when switch *M* has been shifted to any position desired, it can be locked in such position.

P designates a slide-plate which can be slipped between switch *M* when the latter is set vertical, as indicated in Figs. 1 and 3, and is supported on said switch and between cylinders *C C'*, its upper and lower edges being grooved or notched, as indicated, to engage the pointed upper edges of switch-blade *M* and lower edge of deflector II, as shown.

The parts being constructed and arranged substantially as before described, the operation thereof is about as follows: A sheet of paper *W* from the press is brought forward on tapes *A A* toward cylinders *C C'*. As the sheet passes between slitters *I i* it is divided centrally, and as the severed sheet is moved forward toward and over the cylinders the deflector II, lying directly in the line of the cut made by slitters *I i*, deflects the edges of the portions apart, turning the edge of one of the severed portions down toward cylinder *C*, while the adjoining edge of the opposite portion is turned down toward cylinder *C'*, as indicated in the drawings. The air-jets from the deflector materially assist in thus deflecting the paper edges properly. When the severed sheet has been brought to a stop against guides *B B*, the rollers *K K'* are simultaneously depressed, the mechanism being properly timed to depress these rollers only when these severed sheets are brought up to the guides, and binding the sheets against the cylinders *C C'* the sheets are drawn down and around with tapes *D D'*, the slide *P* directing the edge of the sheet down beneath the proper cylinder until it is caught between tapes *D d* or *D' d'*, by which the sheets are carried out in opposite directions to proper folding mechanism. (Not shown.) The rollers *K K'* are raised in time to permit a fresh sheet of paper to be brought forward above the cylinders by tapes *A A*. This mechanism, it will be observed, severs the sheet and sends the opposite halves in different directions, so that

if the original sheet contained matter for two four-page papers they could be separated and folded distinctly. Now by removing slide *P* and shifting switch *M* so that it will nearly touch either of the cylinders *C C'* the edge of the sheet descending around the cylinder adjoining the edge of the blade will be caught by the switch and directed under the opposite cylinder simultaneously with the sheet descending around that cylinder, as indicated in Fig. 4, and both sheets carried out at the same side of the machine by the same tapes laid one upon the other, so that the folder that would fold the single sheet will operate equally and similarly upon the double sheet—that is, fold both together—so that if the original sheet contained matter for an eight-page paper the same can be severed and folded in one operation. The cut made by slitters *I i* on the original sheet is on the line where the tops of the pages in an eight-page paper would unite, and hence when the sheets leave the machine there is no necessity of running them through another cutting-machine to sever the paper sheets at top or for trimming the tops of the pages.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent thereon, is—

1. In a machine for dividing sheets of paper, the combination of a set of delivery-tapes, a pair of cylinders below and parallel to said tapes and the tapes running on said cylinders at right angles to the delivery-tapes, with an angular wedge-pointed deflector located between and partly above said cylinders, and the slitters in front of said deflector, whereby a sheet of paper brought forward by the delivery-tapes is divided into two pieces which are directed by the deflector and cylinders into the lower delivery-tapes, all substantially as and for the purpose described.

2. In a machine for dividing sheets of paper, the combination of a set of main delivery-tapes, a pair of cylinders below said delivery-tapes, and the tapes running upon said cylinders and in opposite directions, with the deflector located above and between the cylinders, the slitters in front of said deflector, and the adjustable switch below said deflector, the parts being so arranged that a sheet of paper brought forward by the delivery-tapes is divided by the slitters and its opposite halves carried downward by the tapes on the cylinders and either carried to opposite sides of the machine or switched to the same side, for the purpose and substantially as described.

3. The combination of the tapes *A A*, the cylinders *C C'*, and the tapes *D D'* and *d d'* with the deflector II, the blower, and the switch-blade below the deflector and between the cylinders, substantially as and for the purpose described.

4. The combination of the tapes *A A*, the stop-guides *B B*, the cylinders *C C'* below

said tapes, and the tapes DD' and *d d'* with the hollow deflector H, and the slide P and supports therefor, and slitters I *i*, all constructed and arranged to operate substantially as described.

5 5. The combination of the delivery-tapes A A, the cylinders C C', the tapes D D' and *d d'*, and the rollers K K' with the slitters I *i*, the deflector H, and the switch M, all constructed substantially as described.

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In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOSEPH L. COX.

Witnesses:

A. E. DOWELL,
P. Z. BROOKS.