

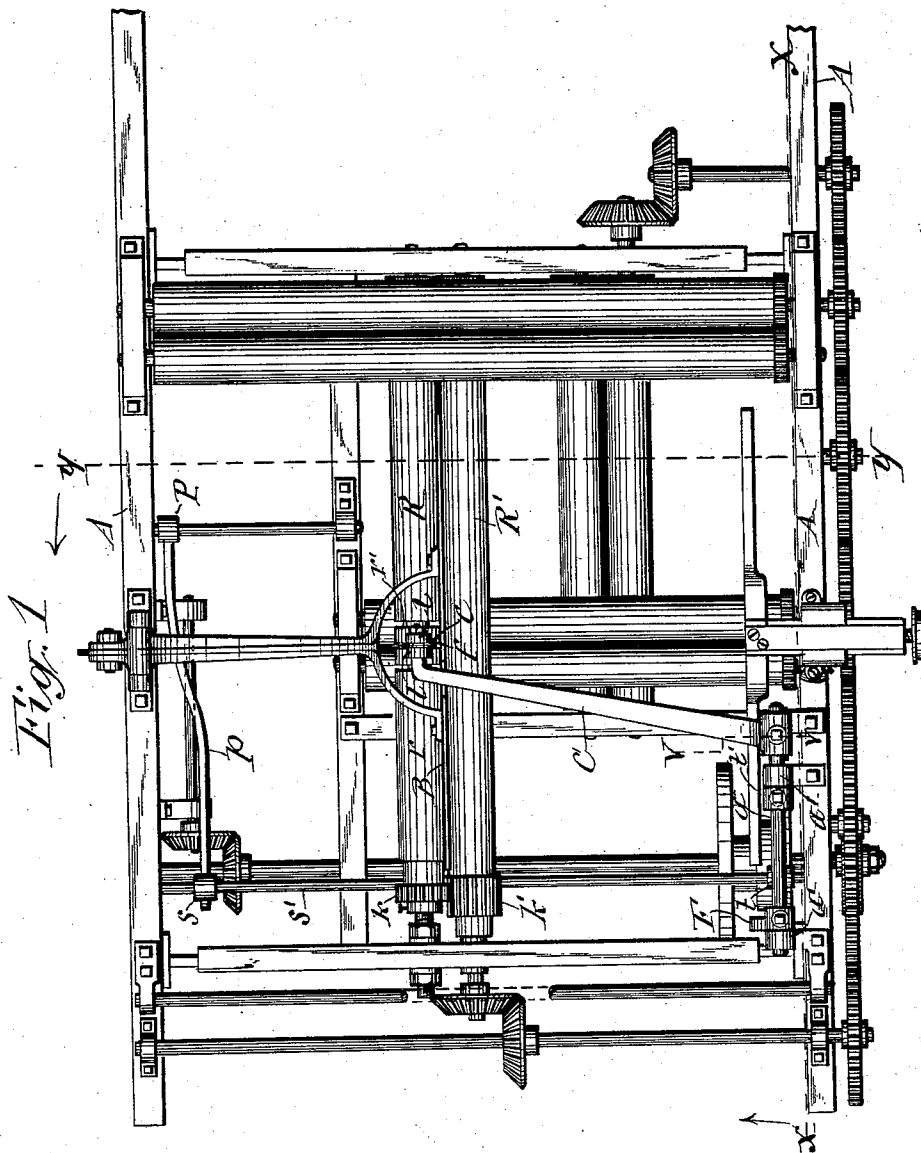
(No Model.)

4 Sheets—Sheet 1.

T. C. DEXTER.
FOLDING MACHINE.

No. 567,300.

Patented Sept. 8, 1896.



WITNESSES:

C. L. Richardson
C. E. Robinson

INVENTOR:

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By E. L. Lacey
his ATTORNEY

(No Model.)

4 Sheets—Sheet 2.

T. C. DEXTER.
FOLDING MACHINE.

No. 567,300.

Patented Sept. 8, 1896.

Fig. 2

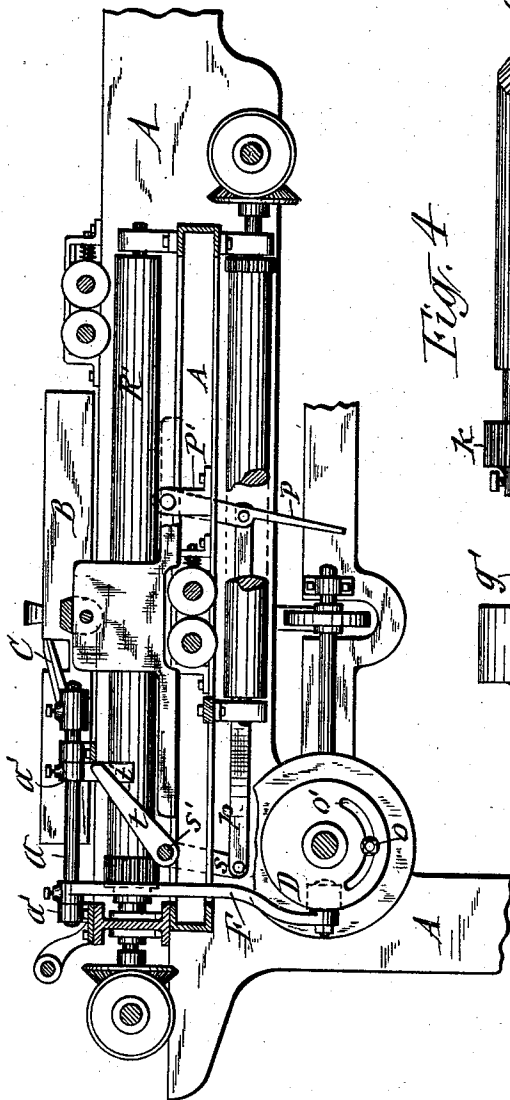
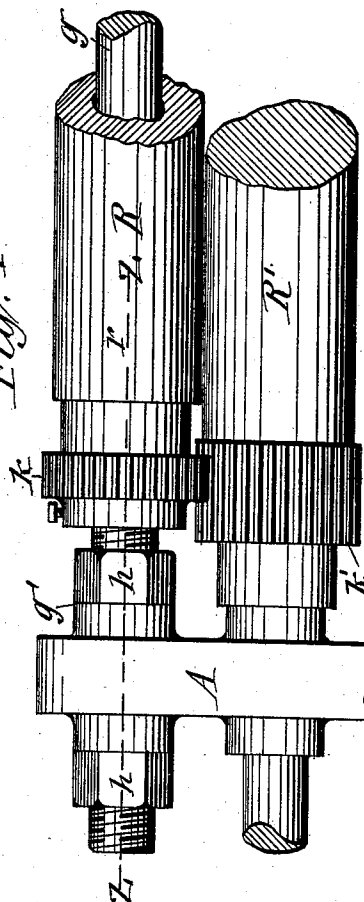


Fig. 4



WITNESSES:

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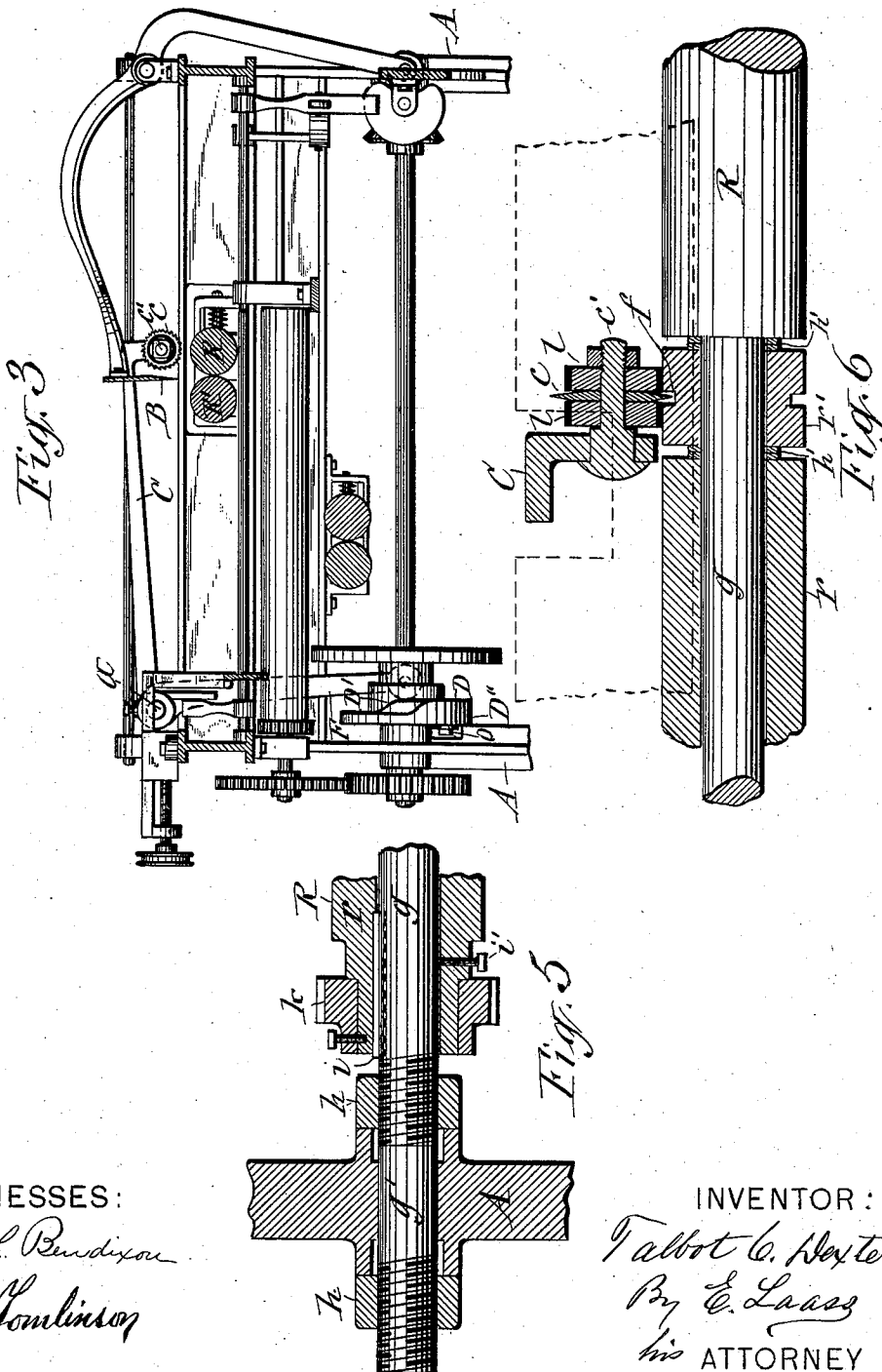
(No Model.)

4 Sheets—Sheet 3.

T. C. DEXTER.
FOLDING MACHINE

No. 567,300

Patented Sept. 8, 1896.



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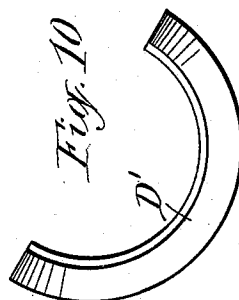
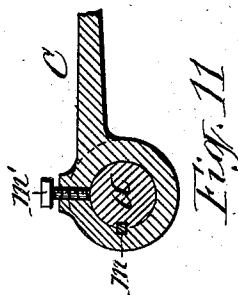
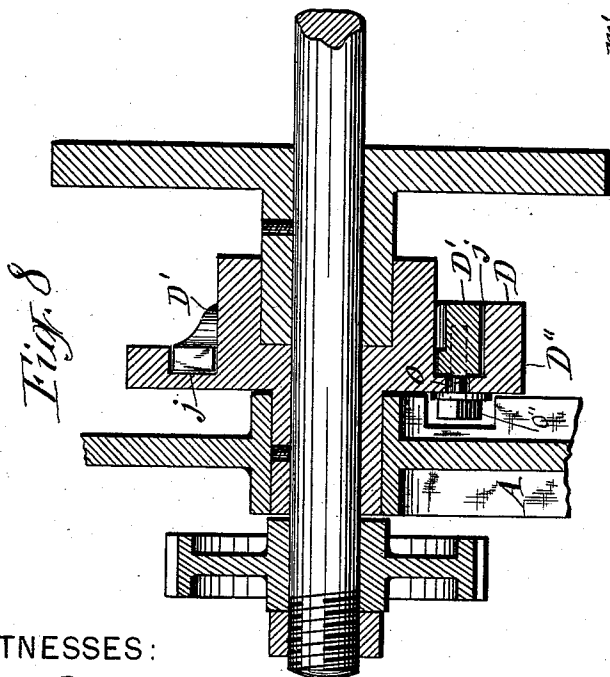
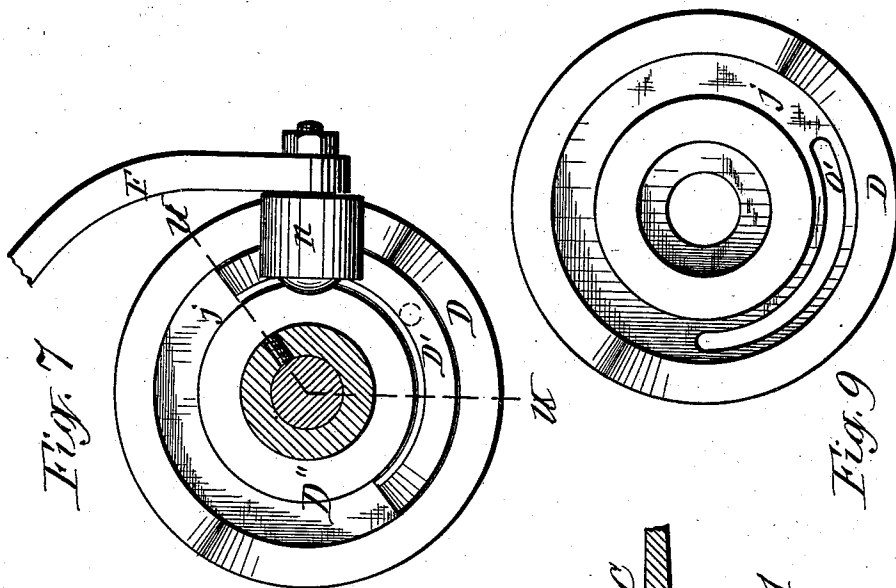
(No Model.)

4 Sheets—Sheet 4

T. C. DEXTER.
FOLDING MACHINE.

No. 567,300.

Patented Sept. 8, 1896.



WITNESSES:

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UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF FULTON, NEW YORK, ASSIGNOR TO THE DEXTER FOLDER COMPANY, OF NEW YORK, N. Y.

FOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 567,300, dated September 8, 1896.

Application filed May 19, 1894. Serial No. 511,747. (No model.)

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, of Fulton, in the county of Oswego, in the State of New York, have invented new and useful
5 Improvements in Sheet-Slitting Attachments to Folding-Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

10 This invention is designed to be used on paper-folding machines for the purpose of preventing the creasing of the sheet during the process of folding the same. It is a well-known fact to those skilled in the use of
15 paper-folding machines that great difficulty is experienced in successively folding a sheet of paper, especially thick paper, without producing creases in the inside leaves, which injury is augmented during each succeeding
20 folding of the sheet.

The object of this invention is to overcome the aforesaid defects and also guard against slitting and thus destroying sheets which have been misfed to the folding-machine.
25 The sheets thus saved can then be folded by hand.

To attain these objects, my invention consists, essentially, in the combination, with one of the folding-rollers, of a sheet-slitting tool carried automatically to and from said roller and timed to come in contact with the sheet immediately or soon after the sheet has been delivered to its position for passing between the folding-rollers, thereby slitting the sheet
30 from the folding-roller to the edge of the sheet during the passage of the sheet between the folding-rollers.

The invention also consists of a safety head-slitter composed of a sheet-slitting tool movable to and from the path of the sheet at the line of folding thereof, and a manually-controlled detent for arresting the approach of said tool to the sheet when desired to prevent the slitting of the sheet; and the invention also consists in certain novel features in the details of the aforesaid devices and means for operating the same, as hereinafter fully described, and specifically set forth in the claims.
40

50 In the annexed drawings, Figure 1 is a plan view of a paper-folding machine equipped

with my improved head-slitter. Fig. 2 is a vertical longitudinal section on line X X in Fig. 1. Fig. 3 is a vertical transverse section on line Y Y in Fig. 1. Fig. 4 is an enlarged
55 plan view of the adjustable end portions of the folding-rollers. Fig. 5 is a longitudinal section of the adjustable end of the sectional folding-roller on line Z Z, Fig. 4. Fig. 6 is a longitudinal section of the central portion of
60 said roller with the slitter in its operative position. Fig. 7 is a face view of the cam which actuates the slitter-carrying arm. Fig. 8 is a transverse section on line U U in Fig. 7. Figs. 9 and 10 are detail views of the com-
65 ponent parts of said cam, and Fig. 11 is an enlarged transverse section on line V V in Fig. 1.

A represents the main frame of the paper-folding machine. 70

R R' denote one of the sets of rollers between which the sheet to be folded is tucked by the blade B, in the usual and well-known manner.

c represents the sheet-slitting tool of my improved head-slitter, which is carried to and from the folding-roller R during the process of folding the sheet and is timed to come in contact with the sheet to slit the same the desired length. To prevent the edge of said
80 slitting-tool from being injured by coming in contact with the metallic roller R, said roller is provided with a circumferential groove f, which the slitting-tool enters part way the depth of the groove. In order to permit the
85 groove f to be properly adjusted to receive the cutting-edge of the slitting-tool, I make the grooved portion of the roller R adjustable laterally in relation to the line of cutting, and this adjustability I prefer to obtain by
90 constructing the roller R of separable end and central sections, one of said end sections being formed with a circumferentially-reduced mandrel g, which is screw-threaded at opposite sides of its journal g', and provided
95 with nuts h h bearing on the ends of the journal-box, as shown in Fig. 5 of the drawings, by the adjustment of which nuts the roller R can be shifted bodily longitudinally. The end section r and central section r' are
100 formed tubular and are mounted longitudinally adjustable on the mandrel g, and are

sustained in their adjusted positions by means of washers or liners h' h' interposed between the central section r' and adjacent end portions of the roller, as illustrated in Fig. 6 of the drawings, and by a key i and set-screw i' fastening the end section r to the mandrel, as shown in Fig. 5 of the drawings, said connection of the sections of the roller affording the primary adjustment, the final adjustment of the roller being effected by means of the nuts h h on the mandrel, as before described. In order to maintain the gears k k' of the folding-rollers R R' in engagement during the aforesaid adjustment, I make one of said gears wider than the other, as clearly shown in Figs. 1 and 4 of the drawings.

For carrying the slitting-tool c to and from the groove f , I employ the arm C , which is attached to a rock-shaft a mounted in bearings a' a' on the frame A , and carrying on its free end the slitting-tool c , which is preferably of the form of a disk journaled on a stud-pin or shouldered bolt c' projecting from the side of a downwardly-deflected ear on the arm, as shown in Fig. 6 of the drawings. Said pin or screw is of sufficient length to receive the friction-rollers l l , between which the slitting-disk c is clamped to compel the same to rotate with said rollers, said rotation being imparted by frictional contact of the rubber-faced rollers l l with the folding-roller R . The slitting-roller may be formed either with a smooth sharp cutting-edge to completely sever the portions of the paper brought in contact therewith, or with a serrated edge to simply perforate the paper, according to the quality of the paper. To allow the arm to be adjusted laterally to conform to the position of the groove f , I attach said arm to the rock-shaft by both a key m and set-screw m' , as shown in Fig. 11 of the drawings. The key serves to maintain the arm at a uniform angle in relation to the rock-shaft while shifting the arm laterally, and the set-screw m' serves to retain the arm in its laterally-shifted position. The arm C receives an intermittent oscillatory motion from a rotary cam D , on which bears a roller n , pivoted to the free end of the lever F , which is fastened to the rock-shaft a . The movement of said arm is timed with that of the folding-blade so that the sheet-slitting tool c is carried to its cutting position on the paper either simultaneously with or soon after the tucking of the sheet between the folding-rollers by the folding-blade. In order to allow the movement of the arm C to be adjusted to carry the slitting-tool c at different periods to the folding-roller R and slit the sheet various lengths, as may be desired, I form the aforesaid cam of two segments D D' , disposed one contiguous to the edge of the other and both concentric to the axis of the wheel D'' , to which they are secured and from which they project to corresponding degrees, so as to have the outer faces of said cams in one and the same plane. One of these cams, preferably the cam D , may be

rigidly or permanently attached and termed the "primary" cam. The other, constituting a secondary cam D' , is secured longitudinally adjustable on the wheel D'' , and is preferably set in an annular groove j in the side of the wheel, in which groove it is movable longitudinally and retained in its adjusted position by a bolt o passing through a segmental slot o' in the wheel and tapped in the cam D' , or otherwise fastened thereto, and provided with a nut o'' on the end protruding at the back of the wheel, as shown in Fig. 8 of the drawings. The roller n is of a sufficient width to ride on both cams D and D' , and by shifting the secondary cam D' so as to cause one of its ends to extend a greater or less distance beyond the corresponding end of the primary cam D the lever F is caused to hold the slitter-carrying arm C a longer or shorter period in its elevated position.

To guard against slitting misfed sheets or sheets carried in a disarranged condition into the folding-machine, I employ a safety head-slitter consisting essentially of the aforesaid slitting-tool c , carried to and from the sheet in the process of folding thereof, and a manually-controlled detent for arresting the approach of said tool to the sheet, and thereby preventing the slitting of the sheet when desired.

It is obvious that inasmuch as the arm C descends by gravity and is only lifted mechanically by the cams D D' , the operator in charge of the folding-machine can arrest the descent of said arm by any suitable barrier or detent. Hence I do not wish to be limited specifically to the mechanism for arresting the movement of the arm C as hereinafter described, which is merely an exemplification of one of the various devices adapted for the purpose and is my preferred mechanism in view of its convenience of being controlled by the person in charge of the folding-machine. Said preferred mechanism consists of the lever P , pivoted to a bracket P' , or other suitable support fixed to the frame A , and preferably in a pendent position at the side of the folding-machine at which the operator usually stands. The lower end portion of the said lever is in a position to be operated by a lateral pressure of the knee of the operator against said lever. This lever is connected by a rod p to the lower end of an arm s , fastened to one end of a shaft s' , which is extended across the machine and is mounted in suitable bearings on the frame A . To the opposite end of said shaft is fastened the detent t , which by the rocking of said shaft is caused to swing back and forth from the back of another arm t' , fastened to the rock-shaft a .

When it is desired to prevent the slitting of the sheet, the operator presses against the lever P while the arm C is in its elevated position. Said lever is thereby caused to throw the arm t back of the arm t' , and thus prevents the slitter-carrying arm C from descend-

ing and slitting the misfed sheet, which is thus saved and may be subsequently folded by hand.

The sheet of paper to be folded is fed to the machine by means of longitudinally-traveling endless tapes in the usual and well-known manner. Said tapes are omitted in the annexed drawings to permit a clearer illustration of the invention.

10 What I claim as my invention is—

1. The combination with a folding-machine making a plurality of folds; of a cutting mechanism for cutting the paper along a line of a first fold and substantially at right angles to a second fold; and means for automatically throwing said cutting mechanism into and out of operative position to cut the paper before said second fold along said first-fold line in such different proportions at the opposite sides of said second-fold line as to prevent during said second fold a movement of the paper upon itself on one side of said second-fold line and to allow a movement of the paper upon itself at the other side of said second-fold line.

2. In combination with two successive pairs of folding-rollers disposed at right angles to each other, a rock-shaft, a lever attached to said shaft, a rotary cam actuating said lever, an arm extending from the rock-shaft, and the sheet-slitter connected to the free end of said arm and carried thereby directly over one of the rollers of the first of the aforesaid pairs, as set forth.

3. In combination with two successive pairs of folding-rollers disposed at right angles to each other, a rock-shaft, a lever attached to said shaft, a rotary wheel, two segmental cams concentric to the axis of said wheel, one of said cams being rigidly attached to said wheel and the other cam being longitudinally adjustable, a roller on the aforesaid lever and in position to be traversed by the aforesaid cams, an arm extending from the rock-shaft to one of the rollers of the first of the aforesaid pairs, and the sheet-slitter connected to the free end of said arm, as set forth.

4. In combination with two successive pairs of folding-rollers disposed at right angles to each other, a cutter carried automatically to and from one of the rollers of the first pair and in line with the bite of the second pair, and a manually-controlled detent for arresting the movement of the cutter to the roller and prevent the slitting of a misfed sheet as set forth.

5. In combination with two successive pairs of folding-rollers disposed at right angles to each other, a rotary cutter riding by gravity upon the top of one of the rollers of the first of said pairs and in line with the bite of the second of said pairs, a cam lifting said cutter intermittently from the roller, and a manually-controlled detent for arresting the descent of the cutter and preventing the slitting of a misfed sheet as set forth.

6. The combination of a paper-folding roller

provided with a circumferentially-grooved central portion sustained longitudinally adjustable in its position and a cutter carried automatically to and from said central portion and adjustable laterally to conform to the aforesaid adjustment of the grooved roller portion as set forth.

7. In a paper-folding machine, the combination of a folding-roller composed of an end section having a circumferentially-reduced mandrel extending from it, a circumferentially-grooved central section and the opposite end section formed tubular and mounted longitudinally adjustable on the aforesaid mandrel, and a cutter carried automatically to and from the central section of the roller and adjustable laterally to conform to the position of the groove of said roller-section as set forth.

8. In combination with the main frame and a paper-folding roller mounted thereon, the companion folding-roller composed of an end section having a mandrel extending therefrom, which mandrel is screw-threaded at opposite sides of its journal-bearing, a circumferentially-grooved central section and the opposite end section formed tubular and mounted longitudinally adjustable on said mandrel, nuts on the screw-threaded portions of the mandrel and abutting against the ends of the journal-box and sustaining the roller longitudinally adjustable, and a cutter carried automatically to and from the central roller-section and adjustable laterally to conform to the position of the groove of said roller-section as set forth.

9. In combination with the main frame and a paper-folding roller mounted thereon, the companion roller composed of separable end and central sections, one of said end sections having a circumferentially-reduced mandrel extending from its inner end and screw-threaded at opposite sides of its journal-bearing, a circumferentially-grooved central section and the opposite end section mounted longitudinally adjustable on said mandrel, liners between the central sections and end sections, nuts applied adjustably to the screw-threaded portions of the mandrel, intermeshing gears of different widths on said rollers, a sheet-slitting tool movable to and from the groove of the central roller-section and adjustable laterally to conform to the adjustment of said roller-section, and a manually-controlled detent arresting the approach of the slitting-tool to the groove of the central roller-section as set forth.

10. In a paper-folding machine, the combination of a folding-roller provided with a circumferentially-grooved central section sustained longitudinally adjustable on the roller, an intermittent oscillatory rock-shaft receiving motion from the folding-machine, an arm mounted longitudinally adjustable on said rock-shaft, a sheet-slitter carried on the free end of said arm in line with the groove of the folding-roller, and a manually-controlled de-

tent for arresting the approach of said arm to the folding-roller when desired to prevent the slitting of the sheet as set forth.

11. In combination with the main frame
5 and roller R, the rock-shaft *a*, arm C attached to said shaft, slitting-disk *c* carried on the free end of said arm, the secondary arm *t* secured to the rock-shaft, the shaft *s'* at right angles to the rock-shaft, the detent *t* and arm

s attached to the shaft *s'*, the lever P pivoted to the frame, and the rod *p* connecting said lever to the crank substantially as set forth.

In testimony whereof I have hereunto signed my name this 8th day of May, 1894.

TALBOT C. DEXTER. [L. S.]

Witnesses:

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GEORGE C. MOORE.