(No Model.) 3 Sheets—Sheet 1.

T. C. DEXTER.

PAPER FOLDING MACHINE.

No. 539,981. Patented May 28, 1895.

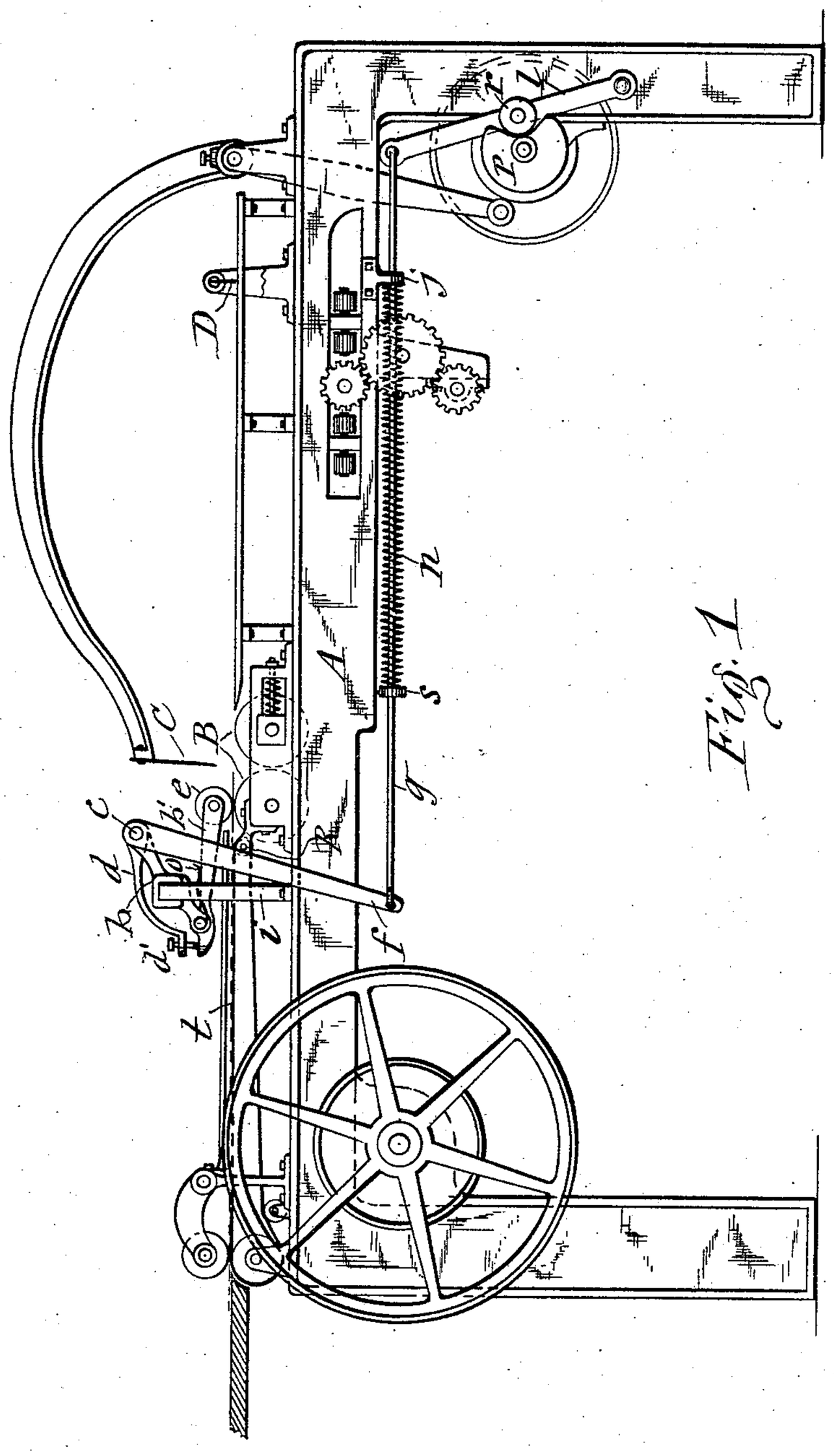

Fig. 1.

WITNESSES:

E. L. Bendixon

J. J. Saass

INVENTOR

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By E. Saass

his ATTORNEY

(No Model.) 3 Sheets—Sheet 2.

T. C. DEXTER.

PAPER FOLDING MACHINE.

No. 539,981. Patented May 28, 1895.

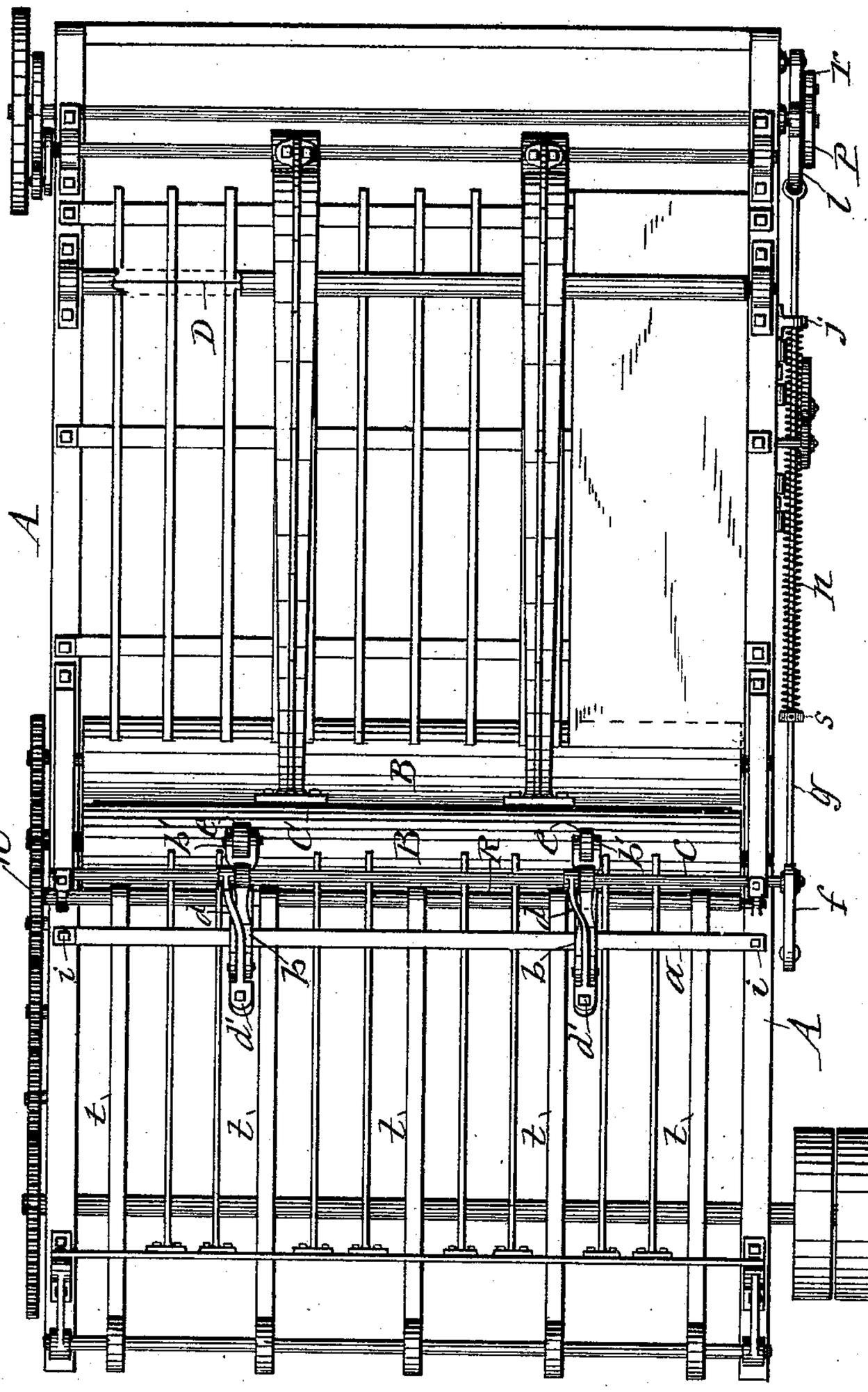

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

T. C. DEXTER.

PAPER FOLDING MACHINE.

No. 539,981. Patented May 28, 1895.

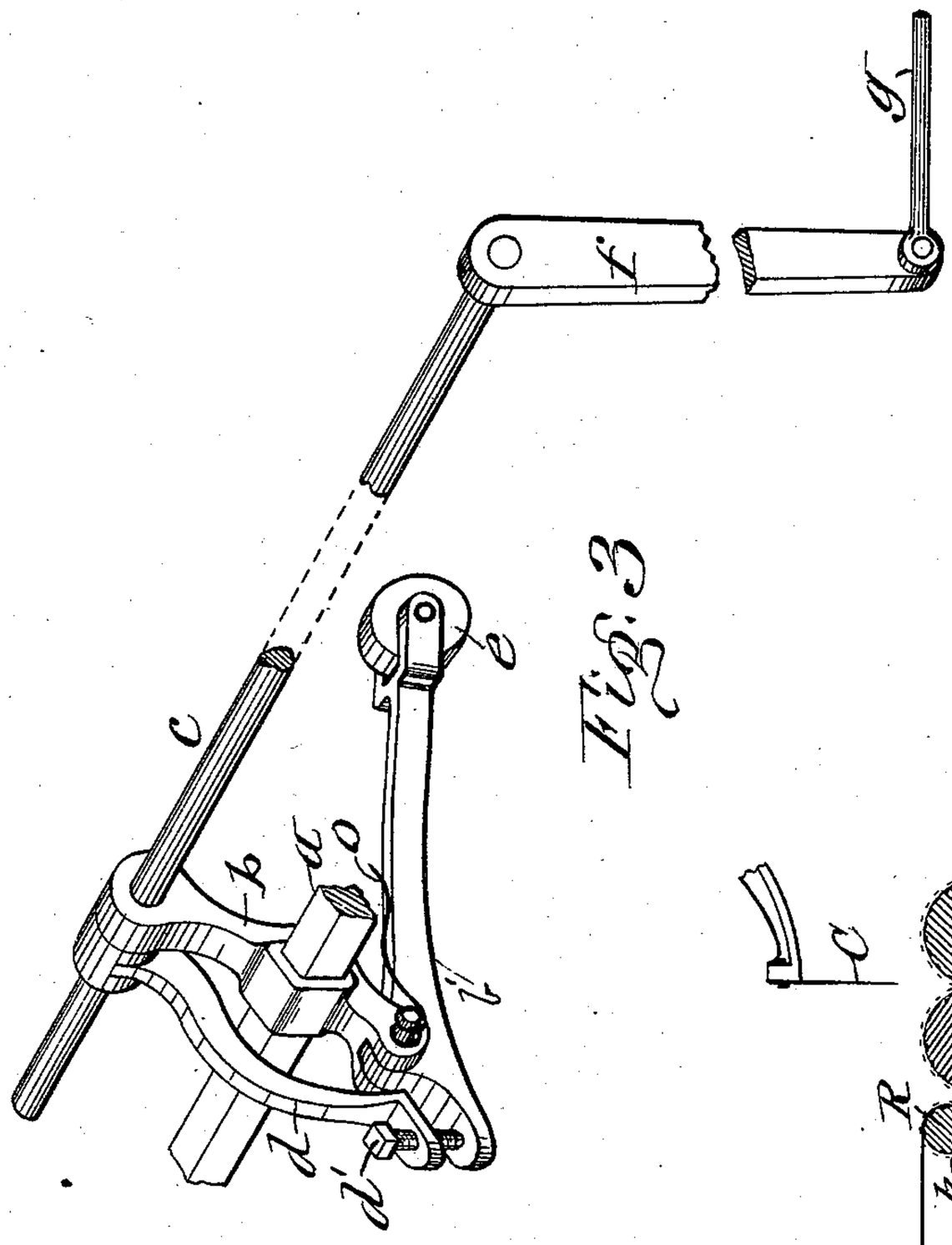

Fig. 3

Fig. 4

WITNESSES:

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INVENTOR:

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By E. Lass

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UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF FULTON, NEW YORK, ASSIGNOR TO THE DEXTER FOLDER COMPANY, OF SAME PLACE.

PAPER-FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 539,981, dated May 28, 1895.

Application filed June 17, 1893, Serial No. 477,944. (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 Improvements in Paper-Folding Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates especially to the class of paper folding machines which are known to printers and publishers as double machines adapted to receive a sheet of paper containing two or more signatures, and to fold said sheet so as to separate the signatures. In the construction of such machines, it is deemed advisable to place the feeding rollers parallel to the first folding rollers and to run the main set of carrying-tapes around the large feeding roller and over to and down between the first fold rollers. Said tapes carry the sheet from the feed-board to the first fold, and after passing the sheet between the folding rollers the same tapes carry the sheet to the second fold gage. This has necessitated running the first folding rollers at the same speed as the feed rollers as otherwise the sheet would be destroyed by the different speeds of travel of the tapes and surfaces of the folding rollers coming in contact with the sheet in passing between the folding rollers. The rapid motion of the folding rollers and corresponding rapid travel of the sheet between said rollers are also liable to interfere with the proper folding of the sheet, inasmuch as a rapid motion of the folding rollers is liable to cause said rollers to pull down the sheet in advance of the descending fold-blade and produce an uneven fold.

The object of my present invention is to provide simple, inexpensive and efficient means for advancing the sheet of paper at a comparatively high speed from the feed-board to its requisite position over the folding roller and checking said speed at the proper time without disturbing it from its plane. By the said rapid advance of the sheet and the subsequent checking of its speed, I expedite the process of folding the sheet without the hereinbefore described dangers of destroying or injuring the sheet or improperly folding the same. The rapid removal of the sheets from the feed-board affords more time for manipulating and properly adjusting the sheets thereon and passing the same to the tapes which convey the sheets over the folding machine. The said rapid feed of the paper also affords more time for registering the sheet before passing it between the folding-rollers which are required to move comparatively slow for the reason hereinbefore stated. By avoiding the disturbance of the sheet from its plane, I effectually insure the maintenance of the alignment of the sheet.

To attain the objects of my invention in a machine having the folding-rollers at right angles to the line of feed, it is necessary, first, to provide a roller parallel with and in proximity to the folding-rollers to carry the feeding-tapes separate and independent of the folding-rollers in order to allow the latter to move slower than the tapes, and, secondly, to employ suitable brakes for pressing the sheet in transit intermittently onto the slower moving folding-rollers and thereby check the travel of the sheet to conform to the surface speed of said rollers which latter speed is reduced to guard against the sheet being drawn down in advance of the descending folding blade; and the invention furthermore consists in certain novel features of the details of the aforesaid brakes and means for operating the same, all as hereinafter more fully described and set forth in the claims.

In the annexed drawings, Figure 1 is a side elevation of a paper-folding machine embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged detached perspective view of one of the brakes, and Fig. 4 is a diagrammatic view of an exemplification of gears by which differential movement is transmitted to the folding-rollers and tape-carrying feed-rollers.

Similar letters of reference indicate corresponding parts.

A— represents the frame of the paper folding machine.

B—B— denote the paper folding rollers, —C— the blade which introduces the paper between said rollers, and —D— the end-gage or dead-stop with which the front edge of the paper in transit comes in contact and is thereby arrested in its movement preparatory to

being introduced between the folding rollers which are disposed at right angles to the line of the feed.

t—*t*— represent the paper feeding tapes which convey the sheets of paper from the feed-board over onto the folding machine and across the folding rollers and to the aforesaid end-gage —D. These tapes have heretofore been extended down between the folding rollers —B—B— and from said rollers to the second fold-gage. Not shown. This arrangement of the said feeding tapes is objectionable for the reasons hereinbefore stated. To obviate this I employ an extra roller or shaft —R— in proximity to and parallel with the first folding roller —B— and carrying the tapes —*t*—*t*— separated from the folding roller and in a plane passing immediately over the top of the roller, as shown in Fig. 1 of the drawings. This tape-carrying roller receives a rapid motion by gear —*h*— which may be arranged in any suitable manner according to the form of driving mechanism connected to the folding machine.

I have shown in Fig. 4 of the drawings a mere exemplification of gears adapted to transmit from the main driving shaft of the machine the different motions to the roller —R— and folding rollers —B—B— and I wish it to be understood that I do not confine myself specifically to the employment of such gears. The folding rollers —B—B— are so geared as to cause their surfaces to travel at about one-half of the speed of the traveling tapes —*t*—*t*—. Said reduced motion of the folding rollers obviates the liability of their drawing the sheet of paper down in advance of the folding blade —C— and wrinkling and ruining the sheet. This reduced speed I also utilize for checking the movement of the paper before it reaches the end-gage or dead stop —D— so as to guard against the rebounding of the sheet from said stop. This I accomplish by means of suitable brakes arranged over one of the folding rollers, preferably the first of said rollers, upon which the said brakes press the paper in transit intermittently. I preferably construct and operate said brakes as follows: Upon props —*i*— secured to the sides of the frame —A— I mount a horizontal bar —*a*— which extends across the machine and is supported at a suitable elevation above the feed-tapes —*t*—*t*. Upon this bar are rigidly mounted the brackets —*b*—*b*— to the lower end of each of which is pivoted the vertically oscillatory finger —*b'*— the free end of which is over the folding roller —B— and has connected to it the friction-roller —*e*—. In the opposite end of the bracket —*b*— is journaled the horizontal rock-shaft —*c*— which extends to one side of the machine and has fastened to its end the rock-arm —*f*. At each of the brackets —*b*— is a lever —*d*— rigidly secured to the rock-shaft and bearing with its free end on the rear end of the finger —*b'*. I preferably provide the free end of the lever —*d*— with an adjustable set-screw —*d'*— by which it bears on the finger. Said set-screw allows the motion of the finger to be adjusted to bear with the requisite force upon the paper in transit. A spring —*o*— may be connected to the bracket and made to bear on the finger —*b'*— to insure its pressure upon the paper.

The rock shaft —*c*— receives motion from a rotary cam —P— driven by the mechanism of the folding machine. A lever —*l*— pivoted at its lower end to the side of the frame —A— has pivoted to it a roller —*r*— by which it bears on the cam —P. The upper end of said lever is connected to the lower end of the arm —*f*— by a rod —*g*— which passes through a hanger or bracket —*j*— attached to the frame —A. A spiral spring —*n*— surrounds the rod —*g*— and bears with one end on the hanger —*j*— and with the opposite on a collar —*s*— fastened to the rod between the hanger and arm —*f*—, said spring serving to hold the lever —*l*— in contact with the cam —P.

In the operation of the machine the rock-shaft —*c*— causes the levers —*d*— to intermittently lift and drop the brake-fingers from and to the paper passing over the folding roller —B—, and when bearing upon said paper it presses the same upon said roller, which revolves at a reduced speed as aforesaid. The frictional contact of this slow moving roller with the paper in transit checks the rapid motion imparted to the paper by the feeding tapes —*t*—*t*. The motion of the rock-shaft —*c*— is so timed as to cause the brake-finger —*b'*— to bear on the paper aforesaid just before it arrives at the end-gage or dead stop —D— and thus prevent the rebounding of the sheet of paper from said gage.

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

1. In combination with the folding-rollers disposed axially at right angles to the line of feed, and the end-gage arresting the movement of the sheet, a tape-carrying roller parallel with and in proximity to the folding-rollers and geared to rotate at a higher speed, a bar extending transversely over the feed-tapes, brackets mounted on said bar, brake-fingers pivoted to said brackets and having their engaging ends directly over one of the folding-rollers, to maintain the sheet in a uniform plane a rock-shaft parallel with the aforesaid bar and levers attached to said rock-shaft and transmitting motion to the brake-fingers substantially as set forth.

2. In combination with the folding rollers, feed-tapes and end-gage, the bar —*a*—, bracket —*b*— mounted on said bar, the finger —*b'*— pivoted to one end of said bracket, the rock-shaft —*c*— journaled in the opposite end of the bracket, the lever —*d*— fixed to the rock-shaft and bearing on one end of the finger —*b'*—, and the friction roller —*e*— connected to the opposite end of said finger, as set forth.

3. In combination with the folding rollers, feed tapes and end-gage, the bar —*a*—, bracket —*b*—, brake-finger —*b'*— pivoted to one end of said bracket, the rock-shaft —*c*— journaled in the opposite end of the bracket, the lever —*d*— fixed to the rock shaft and bearing on the rear end of the brake-finger, the arm —*f*— attached to the end of the rock-shaft, the rotary cam —P—, lever —*l*—, rod —*g*— connecting said lever to the arm —*f*— and a spring holding the lever —D— in contact with the cam, substantially as described and shown.

In testimony whereof I have hereunto signed my name this 28th day of April, 1893.

TALBOT C. DEXTER. [L. S.]

Witnesses:
MARK W. DEWEY,
H. M. SEAMANS.