

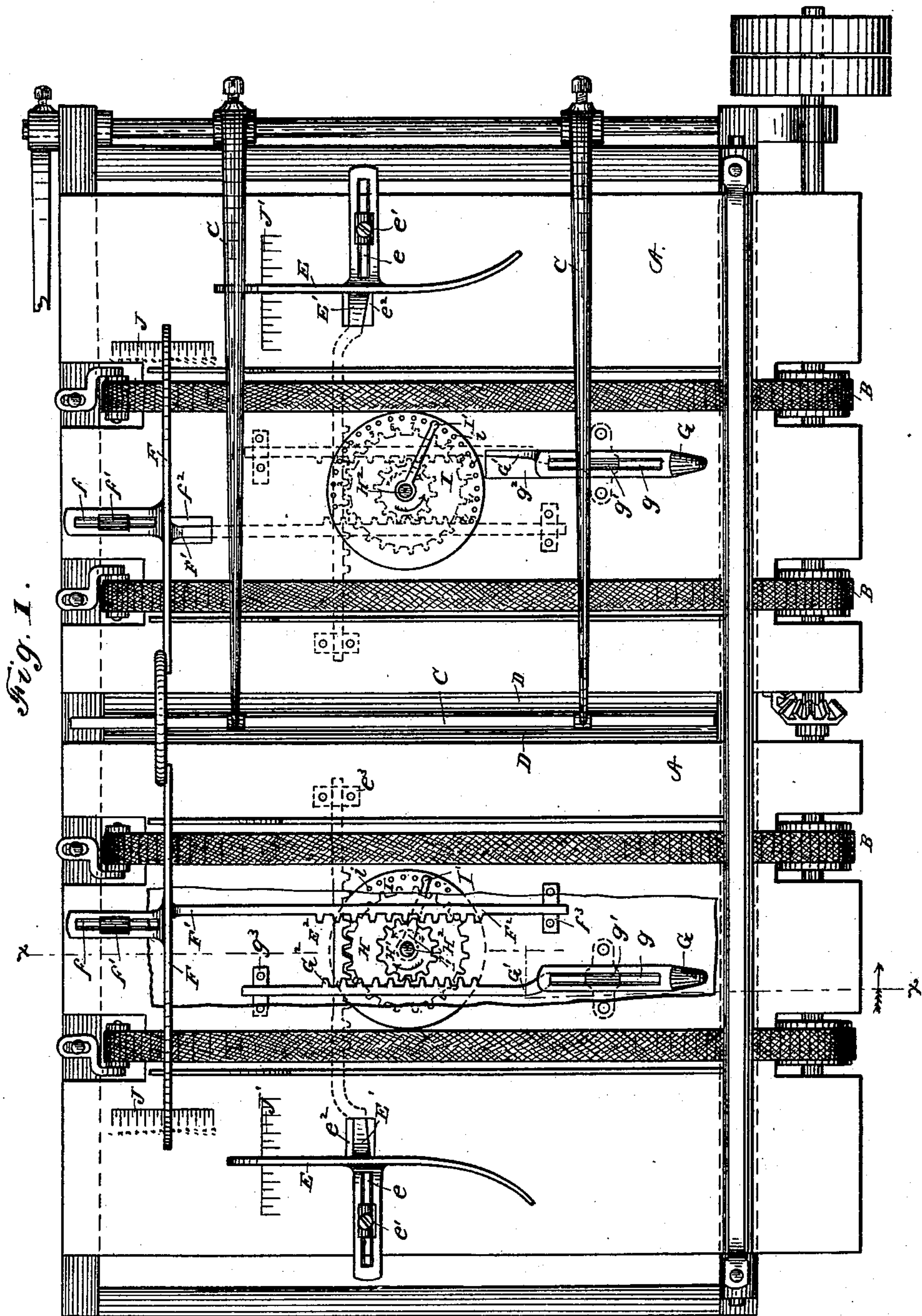
(No Model.)

2 Sheets—Sheet 1.

W. DOWNING.
PAPER FOLDING MACHINE.

No. 330,777.

Patented Nov. 17, 1885.



Witnesses.
W. R. Edelen,
E. F. Spaulding

Inventor.
W. Downing.
Per Hallock & Hallock
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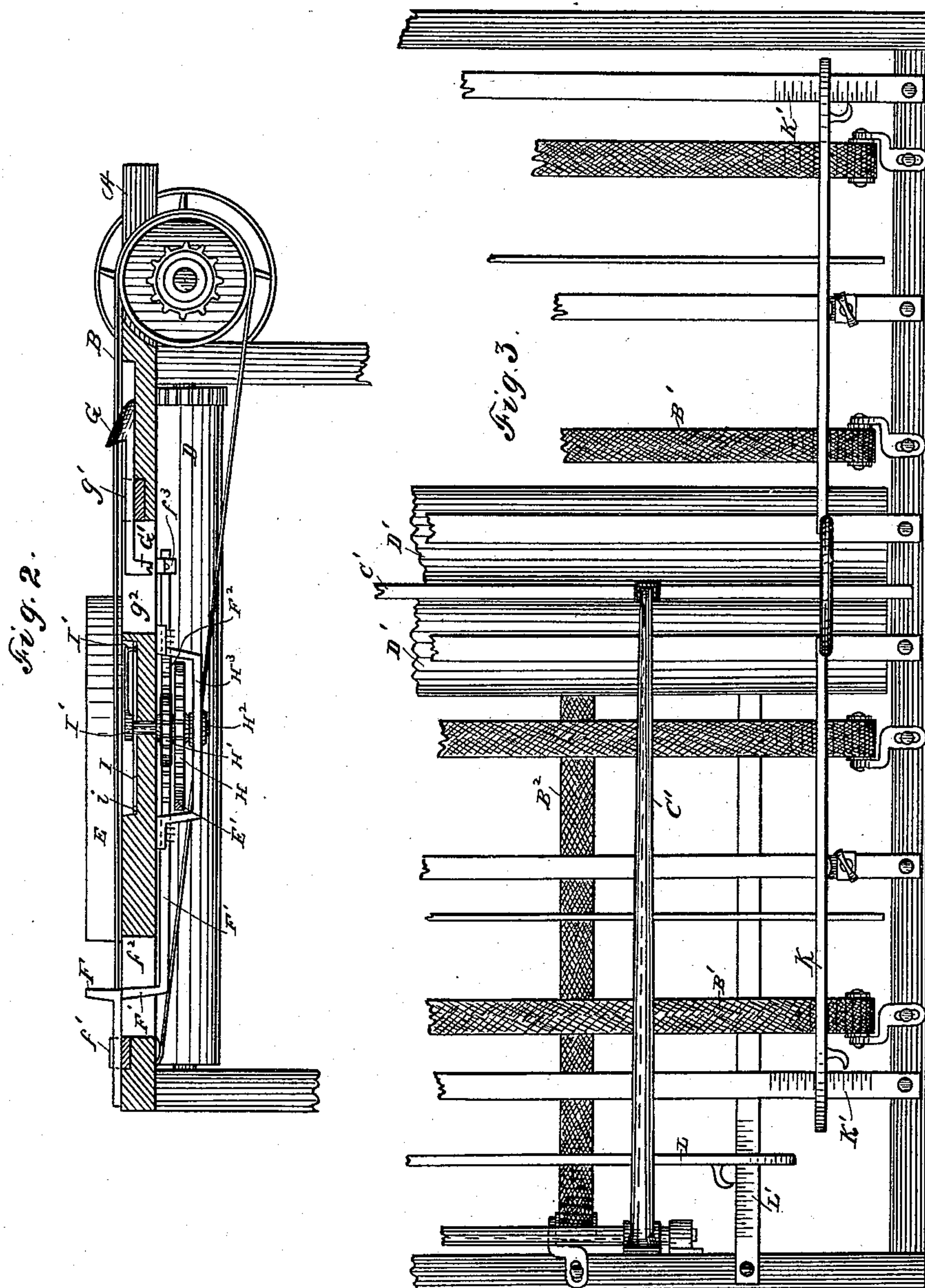
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UNITED STATES PATENT OFFICE.

WELLINGTON DOWNING, OF ERIE, PENNSYLVANIA, ASSIGNOR TO THE
BROWN FOLDING MACHINE COMPANY, (LIMITED,) OF SAME PLACE.

PAPER-FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 330,777, dated November 17, 1885.

Application filed November 28, 1884. Serial No. 149,090. (No model.)

To all whom it may concern:

Be it known that I, WELLINGTON DOWNING, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Paper-Folding Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to paper-folding machines; and it consists in improvements in the construction and operation of the means for guiding the paper to and holding it in proper position to be folded, as will be fully described herein, and pointed out in the subjoined claims.

The accompanying drawings illustrate my invention as follows:

Figure 1 is a top or plan view of a folding-machine with my improvements thereon. Fig. 2 is a transverse vertical section of the upper part of the machine on the line $x x$ in Fig. 1. Fig. 3 is a plan view of parts below those seen in Fig. 1, and shows the stop-gages on the second and third folding-tables.

A is the table or top of the machine; B, the conveyer-tapes. B' and B'' are respectively the second and third sets of tapes; C, the first starter; C', the second starter; D D, the first folding-rolls; D' D', the second folding-rolls. These parts are all constructed as commonly, and form no part of my invention. A sheet of paper entering the machine, moves from the lower to the upper side of Fig. 1, and from the right to the left side of Fig. 2.

E E are the side guides. F F are the forward stop-gages. These parts are common in folding-machines, and my invention, so far as they are concerned, relates to the means by which they are adjusted.

G G are what I call "back stops." They allow the sheet of paper to pass freely over them, as it enters the machine, but prevent it rebounding as its forward edge strikes the front stops, as will sometimes occur, especially when the paper possesses considerable body, such as book-paper for instance.

K is the front stop on the second folding-table. L is the same stop on the third folding-table.

J J, J' J', K', and L' are graduated scales to assist in setting the several guides and stops.

The first part of my invention relates to the back stops, G G, and consists in providing the same. Heretofore there has been no means provided for preventing the rebound of a sheet of paper when it strikes the front stops, F F. The rebounding often causes considerable variation in the folding of a series of sheets, which on book-work is very objectionable.

The form of the stops G is clearly seen in Fig. 2. They lie mostly below the tape. Only a barb-like point sticks above the tapes. The incoming sheets move freely over this point, but once past it the sheet can not rebound over it, as it catches the back edge of the sheet.

It should be understood that this device may be made so as to be separately adjustable, its use not being limited to the means for adjustment here shown.

The second part of my invention consists in providing means whereby all of the guides and stops can be adjusted simultaneously when desired. The adjustment whereby this is effected is as follows: On the face of the table A, on each side of the folding-rolls, is a countersunk dial-plate, I, with an index or crank arm, I', which is attached to a shaft, H², which is journaled below the table in a frame, H³. On this shaft are two pinions, H and H', the former of which has twice the number of cogs that the latter has. The guides E E on each side of the table have arms E', which pass through slots e^2 in the table, and extend along the under side of the same past the pinions H to guide-clips e^3 , and are provided with cogs E², which engage said pinions. The stops F and G, on each side of the table, are provided with arms F' and G', which pass down through slots f^2 and g^2 in the table, and extend past the pinion H' to guide-clips f^3 and g^3 , and are provided with cogs F² and G², which engage the pinions H² on each side, so that the pinion will move the said stops oppositely. By these devices a movement of the two index-

arms I' will move all the guides and stops simultaneously; but the two guides will move twice the distance the stops move by a given movement of the arms I'. The reason for having this difference in movement is, that paper is generally so cut that the sheets vary in size by increasing the length twice as fast as the breadth: thus, ten by twenty, eleven by twenty-two, twelve by twenty-four. Of course this rule is not universal, and therefore I provide for separately adjusting the side guides, E. This is done by loosening the screws e', which hold the guides to the arms E', and this, by reason of the slots e in the guide, allows the guides to be moved independent of the arms E'. The stops F and G can be made separately adjustable, if desired; but it is not necessary, as they can always move simultaneously.

In place of using the index-arms to move the stops and guides, it may be done by taking hold of one of the guides or stops and pushing or pulling it, as required. This will be the usual method of making the adjustment, I expect, and it will be done by standing at the side of the machine and taking hold of the two stops F F at once, one in each hand, or the two guides E E, if preferred.

To enable the adjustments to be made rapidly without measuring, I put on the table, under the guides E E and under the stops F F, marked scales J' and J, respectively, and for the same purpose, to be used when desired, I provide on the plates I a series of equally-separated stop-holes, i, into which a point on the under side of the arms I' will enter, and I number the holes i to correspond with the numbers on the spaces of the scales J and J'. The arm I' is made thin enough so as to spring sufficiently to allow the pin to be drawn from the holes i easily, and the pin may be beveled so as to easily slip out of and over the holes when the adjustment is made by pushing or pulling the guides or stops, as above stated.

By reference to Fig. 3 it will be seen that I also provide in connection with the stops K and L marked scales K' and L' to aid in the adjustment of said stops.

What I claim as new is—

1. In a paper-folding machine, the combination, substantially as set forth, of a stop for limiting the forward movement of an incoming sheet, and a stop for preventing the said sheet from rebounding from the said front stop.

2. In a paper-folding machine, the combi-

nation, substantially as set forth, of an adjustable stop for limiting the forward movement of an incoming sheet, an adjustable stop for preventing the said sheet from rebounding from the said front stop, and adjustable side guides which control the position of the sheet relative to the folding-rollers.

3. In a paper-folding machine, the combination, substantially as set forth, of an adjustable front stop, an adjustable back stop, and means, substantially as shown, for actuating both of said stops simultaneously.

4. In a paper-folding machine, the combination, substantially as set forth, of an adjustable front stop, an adjustable back stop, adjustable side guides, and means, substantially as shown, for actuating all of said stops and guides simultaneously.

5. In a paper-folding machine, the combination, substantially as set forth, of adjustable front stops, adjustable side guides, and means, substantially as shown, for actuating said guides and stops simultaneously.

6. In a paper-folding machine, the combination, substantially as set forth, of the adjustable stops F and G, the rack-toothed arms F' and G', the pinion H', the crank-arm I', and the dial I.

7. In a paper-folding machine, the combination, substantially as set forth, of the adjustable front stops F and F, the adjustable side guides, E and E, the rack-toothed arms F' F', E' and E', and the pinions H and H' and H and H'.

8. In a paper-folding machine, the combination, substantially as set forth, of the adjustable front stops F and F, the adjustable side guides, E and E, the rack-toothed arms F' F', E' and E', the pinions H and H' and H and H', the crank-arms I' and I', the dials I and I with the equally spaced and numbered stops i i.

9. In a paper-folding machine, the combination, substantially as set forth, of the adjustable front stops F and F, the adjustable side guides, E and E, the rack-toothed arms F' F', E' and E', the pinions H and H' and H and H', the crank-arm I, and the indicating-scales J and J or J' and J'.

In testimony whereof I affix my signature in presence of two witnesses.

WELLINGTON DOWNING.

Witnesses:

J. F. DOWNING,

JNO. K. HALLOCK.