

No. 641,000.

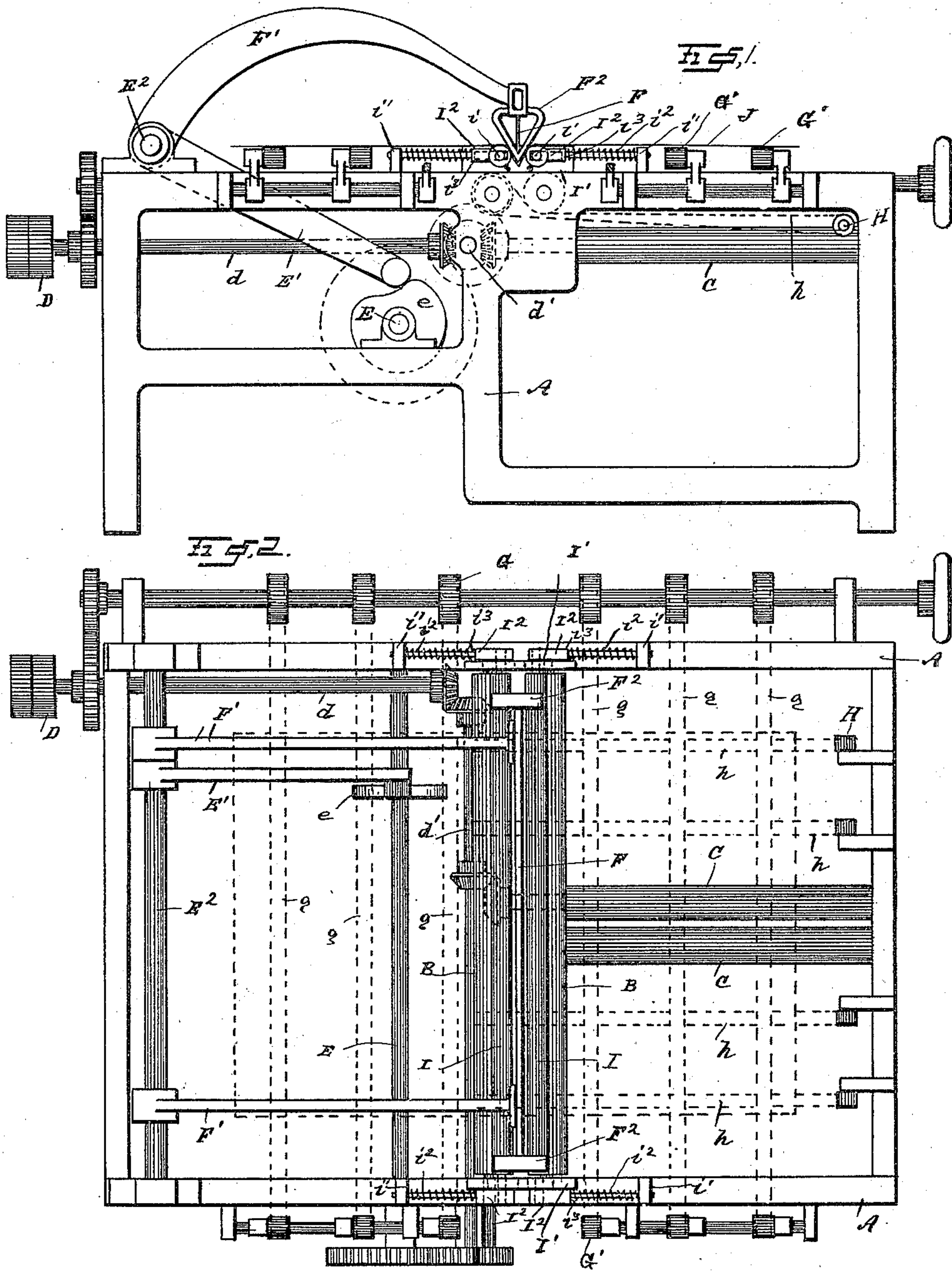
**Patented Jan. 9, 1900.**

W. DOWNING & F. H. WENDT.

## FOLDING MACHINE.

(Application filed Mar. 24, 1898. Renewed June 16, 1899.)

(No Model.)



**WITNESSES:**

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# UNITED STATES PATENT OFFICE.

WELLINGTON DOWNING AND FREDRICK H. WENDT, OF ERIE, PENNSYLVANIA.

## FOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 641,000, dated January 9, 1900.

Application filed March 24, 1898. Renewed June 16, 1899. Serial No. 720,843. (No model.)

*To all whom it may concern:*

Be it known that we, WELLINGTON DOWNING and FREDRICK H. WENDT, citizens of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Folding-Machines; and we 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 folding-machines; and it consists in certain improvements in the construction thereof, as will be hereinafter fully described, and pointed out in the claims.

The invention is illustrated in the accompanying drawings as follows:

Figure 1 shows a side elevation of a folding-machine containing our invention. Fig. 2 shows a plan view of the same machine.

A marks the frame of the machine, B B the first-fold rolls, and C C the second-fold rolls.

The machine is driven from a drive-pulley D, which drives the shaft *d*, which in turn drives the shaft *d'*. The shaft *d'* through suitable gearing drives the rolls B B and C C. The shaft E is also driven from the shaft *d'* and has mounted upon it the cam *e*. The end of the lever E' rides on the cam *e* and gives to the rock-shaft E<sup>2</sup> the proper movement to actuate the starting-blade F, which is operated by the rock-shaft E<sup>2</sup> through the medium of the arms F'. The conveyer-tapes, which are indicated by dash-lines at *g*, are driven by the spools G and supported at the opposite side of the machine by the loose spools G'. The tapes for conveying the paper from the first to the second fold rolls are indicated by the dash-lines at *h* and pass over one of the first-fold rolls and loose spools, as in the ordinary construction.

All the mechanism just heretofore described does not differ materially from that now in general use.

Some difficulty has been encountered with this class of machines in making the fold follow the lines of initial contact of the starting-blade with the paper. This difficulty has been largely due to the fact that when the supports for the paper at each side of the

line of contact of the starting-blade have been so far apart that the span of the paper between them has been of considerable length the lighter papers have been apt to sag or to be sucked in by the rolls, so that folds of uniform register have not been produced. On the other hand, where the supports in the machines now in use have been brought sufficiently close to the line of initial contact of the starting-blade to properly support the paper the angle of the span of paper when it has reached the bite of the rolls has been made so sharp as to be undesirable for various reasons, among which may be stated the smearing of paste on the starting-blade when pasting has been done and the difficulty in handling heavy glazed paper, which has a tendency to slip out of register when the supports are placed too close together. In our invention the supports for the paper at each side of the line of contact of the starting-blade are brought as close to the line of contact as is desired, and at the same time the angle of the span of paper is kept as obtuse as is desired during the further movement of the paper toward the bite of the rolls. In this way a perfect register is effected by giving to the paper the proper support for its initial movement and the closing in of the paper on the starting-blade during the latter part of the starting movement is obviated.

Our invention consists therefore, broadly, in providing movable supports for the paper at each side of the line of contact of the starting-blade, which may be moved apart as the paper is forced down toward the bite of the rolls, so as to maintain as obtuse an angle of the span of paper as desired. In the construction shown this is accomplished in the following preferable manner: Above the rolls B B are placed two auxiliary rolls I I, which form the supports for the paper at each side of the starting-blade. The rolls I I have their journal-pins *i* mounted in slotted bearings I' I', which allow a lateral movement of the rolls I I. The bearing-pins *i* extend through the slots in the bearings I' into slides I<sup>2</sup>. The slides I<sup>2</sup> extend through lugs *i'* on the frame, and a spring *i*<sup>3</sup> is coiled around the slides I<sup>2</sup> and, operating between the lugs *i'* and the shoulders *i*<sup>3</sup> on the slides, press the rolls



I I toward each other or toward the line of contact of the starting-blade. A spreading-cam  $F^2$  is carried on the starting-blade and is so shaped and proportioned as to allow an initial action of the starting-blade upon the paper before effecting a movement of the supporting-rolls I. As the paper receives its initial start it has the support of the rolls I at the position necessary to insure a perfect starting of the paper by the starting-blade, and the spreading-cams  $F^2$  operate upon the rolls I so that as the starting-blade continues in its movement the supporting-rolls I are spread apart so as to maintain the angle desired in the paper at each side of the folding-line. In Fig. 1 the paper is marked J, and its location in the machine is indicated in Fig. 2 by dash-lines. As shown in Fig. 1 the paper has received its initial movement and has the support of the rolls I at each side of the starting-blade and the spreader-cam has just reached a position to begin the spreading movement of the supporting-rolls.

It will be noted that in the construction shown the cam-spreader by its contact with the supporting-rolls and downward movement between them effects a rotary movement of the rolls in proportion to the movement of the paper, so that the movement of the paper over them is facilitated.

What we claim as new is—

1. In a folding-machine, the combination of a pair of folding-rolls; supports for the paper at each side of the folding-line of said rolls; a means for varying the distance between said supports with the movement of the paper toward the bite of said rolls.

2. In a folding-machine, the combination of a pair of folding-rolls; supports for the paper arranged above said rolls, and at each side of

the folding-line thereof; a means for spreading said supports with each movement of a folding-line of the paper from said supports toward the bite of said rolls.

3. In a folding-machine, the combination of a pair of folding-rolls; a pair of auxiliary rolls arranged above said folding-rolls and, in position to support the paper to be folded; and means for spreading said rolls with each movement of a folding-line of the paper from said supports toward the bite of said rolls.

4. In a folding-machine, the combination of a pair of folding-rolls; supporting-rolls for the paper arranged above said rolls in position to support the paper to be folded; means for spreading said supporting-rolls with each movement of a folding-line of the paper from said supporting-rolls toward the bite of said folding-rolls; and means for rotating the supporting-rolls during their spreading movement.

5. In a folding-machine, the combination of a pair of folding-rolls; supports arranged at each side of the folding-line thereof for supporting the paper to be folded; springs arranged to press said supports in one direction; and a cam mechanism for operating said supports in the opposite direction.

6. In a folding-machine, the combination of the folding-rolls, B B; the supports, I I; the supporting-blade, F; the cams,  $F^2 F^2$ ; the slotted bearings, I' I'; and the spring-actuating slides, I<sup>2</sup>.

In testimony whereof we affix our signatures in presence of two witnesses.

WELLINGTON DOWNING.

FREDRICK H. WENDT.

Witnesses:

M. BURY,

H. C. LORD.