

No. 742,299.

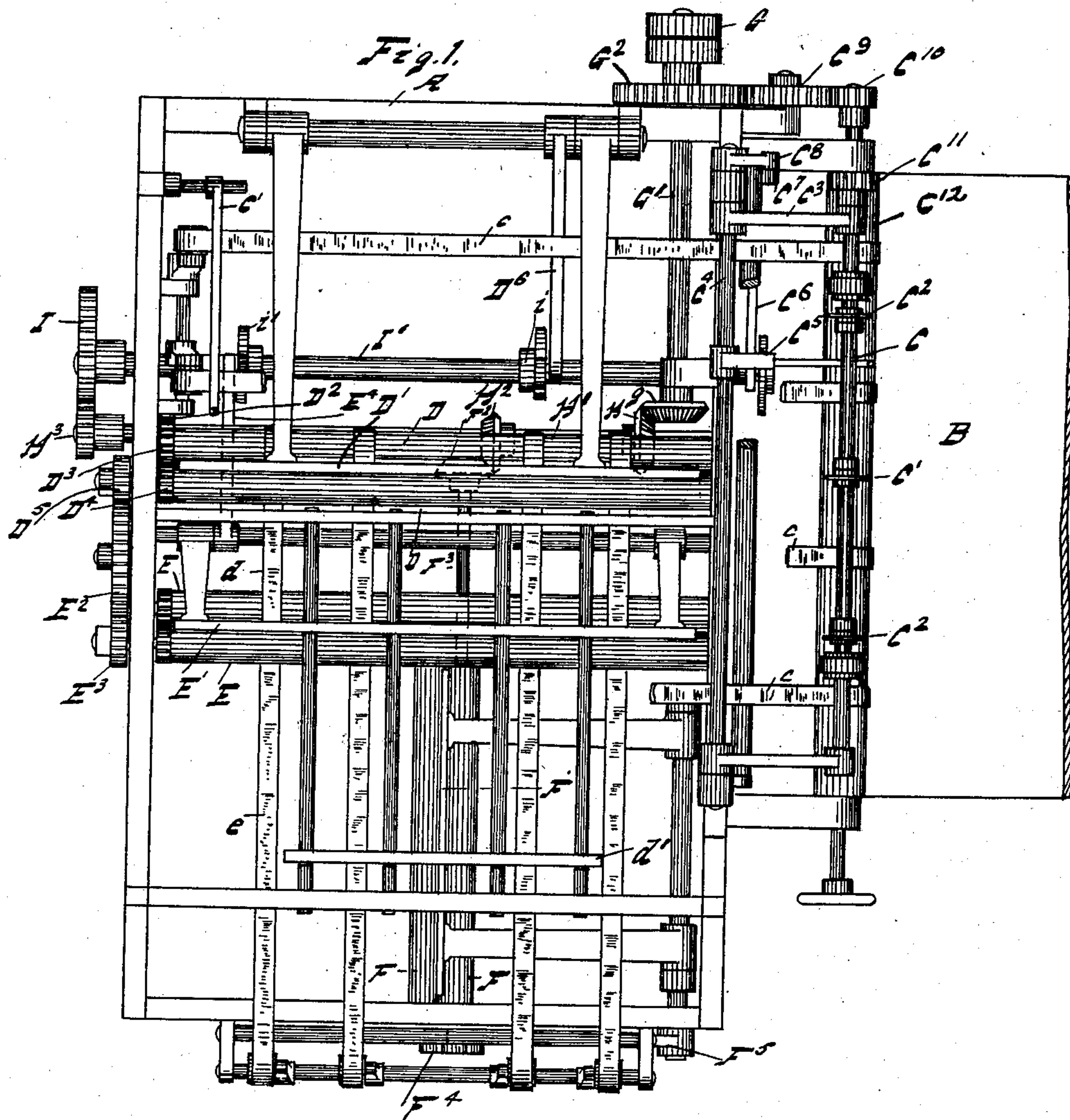
PATENTED OCT. 27, 1903.

W. DOWNING.
FOLDING MACHINE.

APPLICATION FILED MAY 8, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses
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M. A. Lord.

Inventor
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by W. C. Lord
Atty.

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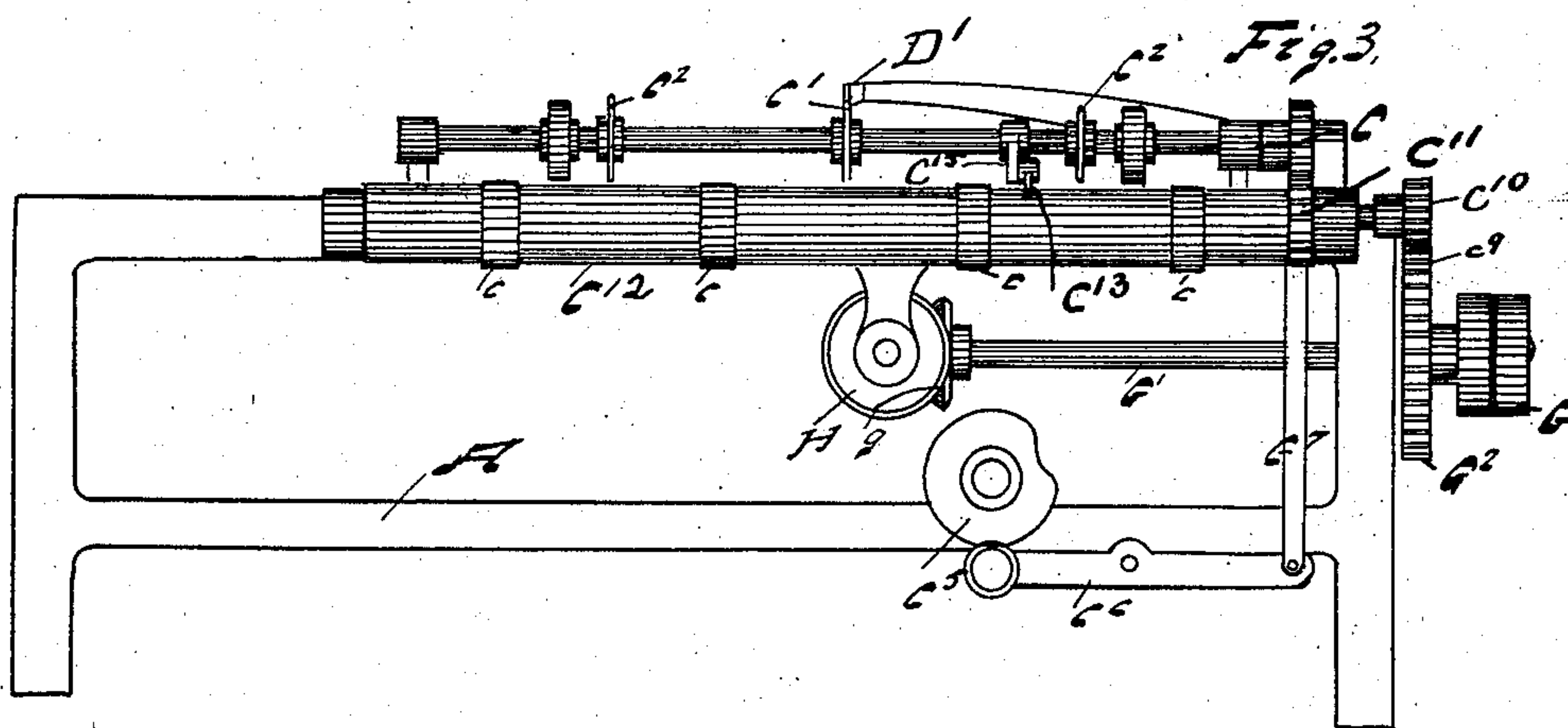
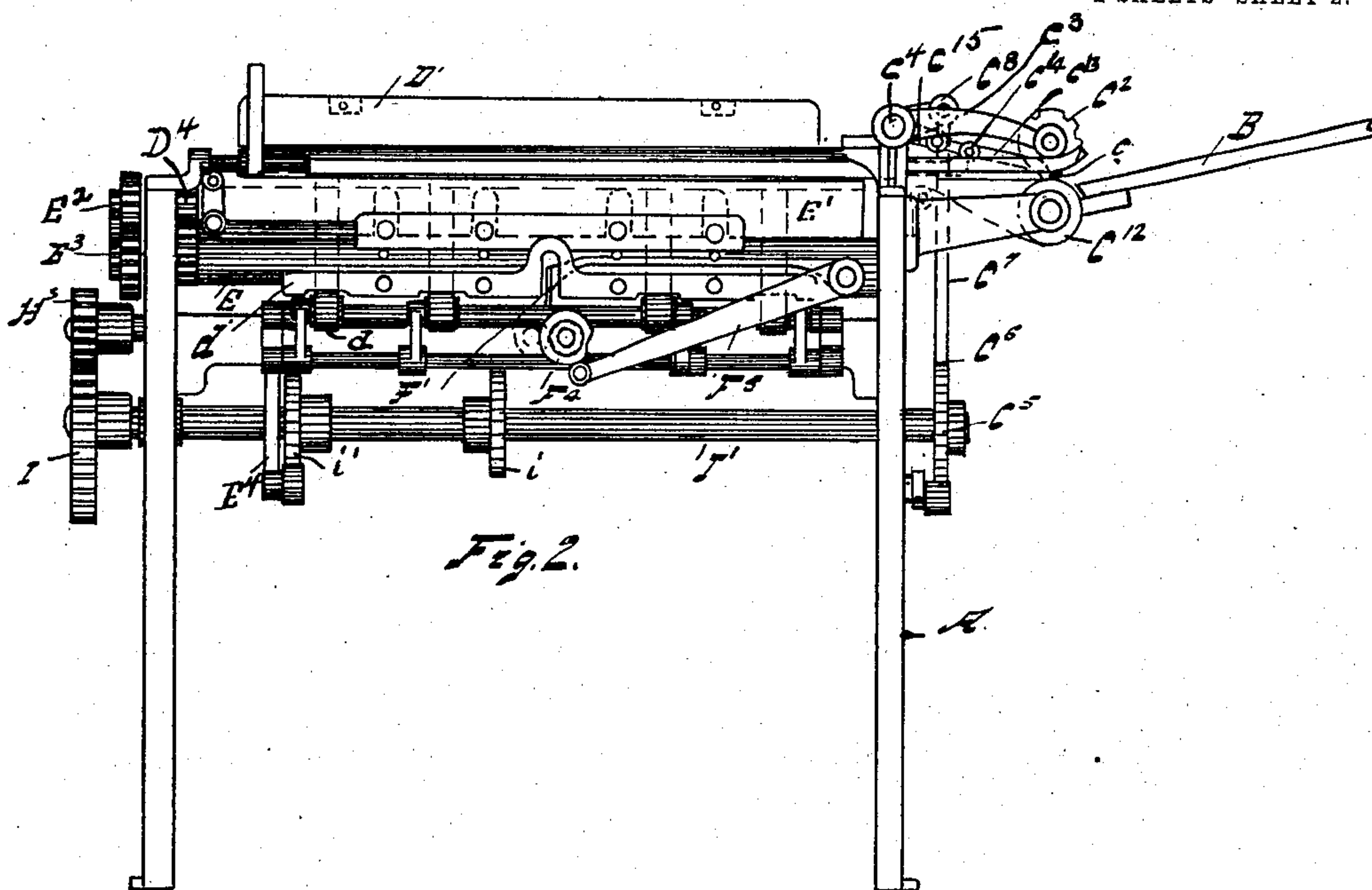
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UNITED STATES PATENT OFFICE.

WELLINGTON DOWNING, OF ERIE, PENNSYLVANIA.

FOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 742,299, dated October 27, 1903.

Application filed May 8, 1901. Serial No. 59,291. (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 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 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 plan view of the machine. Fig. 2 shows a side elevation from the bottom of Fig. 1. Fig. 3 shows a side elevation from the right of Fig. 1.

A marks the frame of the machine; B, the feed-board; C, the drop-roll; D D, the first-fold rolls; D', the starter for the first-fold roll; E E, the second-fold rolls; E', the starter for the second-fold rolls; F F, the third-fold rolls, and F' the starter for the third-fold rolls. The tapes *c* carry the paper from the drop-roll C over the first-fold rolls. The tapes *d* carry the paper from the first-fold roll over the second-fold roll and the tapes *e* from the second-fold rolls over the third-fold rolls. Arranged on the drop-roll C is the perforator C', which is in line with the first-fold roll. At each side of the perforator C' is a perforator C². These are at equal distances from the perforator C', so that they are brought into register by the first fold. The mechanism is arranged to bring the perforations made by the perforators C² C² over the second-fold line, and the second fold is made along these lines of perforations. The third fold is made at an angle to the first and second folds, ordinarily at a right angle. This arrangement of perforations permits the folding of two parallel folds and then a fold at an angle to these parallel folds without buckling.

I am aware that perforations have been used for preventing buckling; but I am not aware that perforations have been arranged so as to make lines of perforations at proper

distance from the first fold to form a fold-line for the second fold, and I am not aware that three lines of perforations have been used where two parallel folds are made with a third fold at an angle to these folds. Any desirable means of operating mechanism may be employed and any desirable means of drop-roll mechanism may be used. In the machine shown it is as follows: A drive-pulley G is arranged on the drive-shaft G'. A gear *g* on the shaft meshes the gear H on the shaft H'. The gear D² on the shaft H' meshes the gear D³ on the roll D, and a gear D⁴ operates the companion roll from the gear D³. Extending from one of the rolls D is a shaft carrying the gear D⁵. This gear meshes an intermediate gear E². The intermediate gear E² meshes the gear E³, which is carried with the roll E. The companion roll E is driven from the roll E, connected with the gear E³, in the ordinary manner. Arranged on the shaft H' is a gear H², and meshing this gear is a gear F². The gear F² is fixed on the shaft F³, which is connected with the roll F. The second roll F is driven by the first roll in the usual manner.

The drop-roll C is carried by an arm C³, which is arranged on a rock-shaft C⁴. A gear H³ is fixed on the shaft H', and meshing this gear is a gear I. The gear I is fixed on the shaft I'. The cam C⁵ actuates the lever C⁶. A link C⁷ connects the lever C⁶ with an arm C⁸. The arm C⁸ is fixed on the rock-shaft C⁴. The drop-roll is operated by this mechanism. Arranged on the shaft G' is a gear G², and meshing this gear is an intermediate gear C⁹. The gear C⁹ meshes the gear C¹⁰ on the feed-roll C¹². A gear C¹¹ is arranged to operate the drop-roll from the feed-roll. The stop C¹³ is carried by the rod C¹⁴. The rear end of the stop is engaged by the arm C¹⁵ on the rock-shaft C⁴. It will readily be seen that with the downward movement of the drop-roll the stop C¹³ will be raised. A cam *i* is arranged on the shaft I'. An arm D⁶, operating on this cam, actuates the starter D', and the cam *i'* on the shaft I' operates the starter E' through an arm E⁴. A cam F⁴ on the shaft F³ operates the starter F' through an arm F⁵. A stop *c'* is arranged to position the paper over the first-fold roll and a stop *d'* is arranged to position the

paper over the second-fold roll, so as to bring the perforations formed by the perforations $C^2 C^2$ over the second-fold line.

What I claim as new is—

- 5 1. In a folding-machine, the combination of the rolls, D D and rolls, E E, arranged in parallel relation; the drop-roll, C; the perforators, C^2 , C' and C^2 , on said drop-roll in the relation described; means for conveying the paper from the drop-roll over the first-fold roll and from the first-fold roll to the second-fold roll; a third-fold roll arranged at right angle to the second-fold roll; and means for conveying the paper from the second-fold roll to
15 the third-fold roll.

2. In a folding-machine, the combination of

the fold-rolls D D and E E, arranged in parallel relation; the drop-roll, C; the feed-roll, C^{12} ; means for driving said rolls; a stop arranged to operate with the drop-roll; the perforators, C^2 , C' and C^2 , on the drop-roll arranged in the relation to the fold described; the rolls, F F; and means for conveying paper from the second-fold roll over the third-fold roll. 20 25

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

WELLINGTON DOWNING.

Witnesses:

R. F. LANZE,
M. A. LORD.