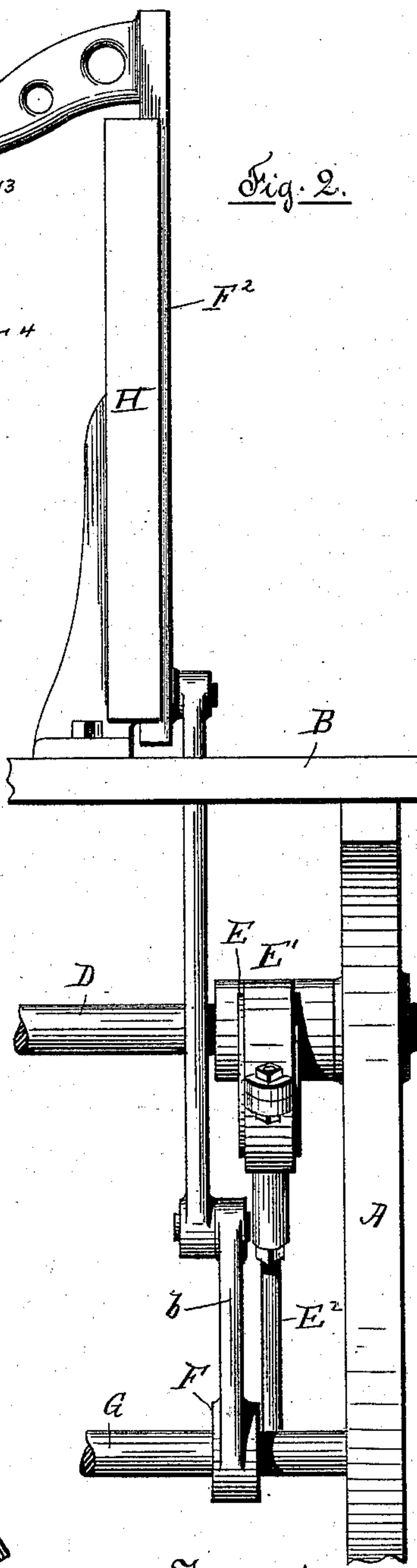
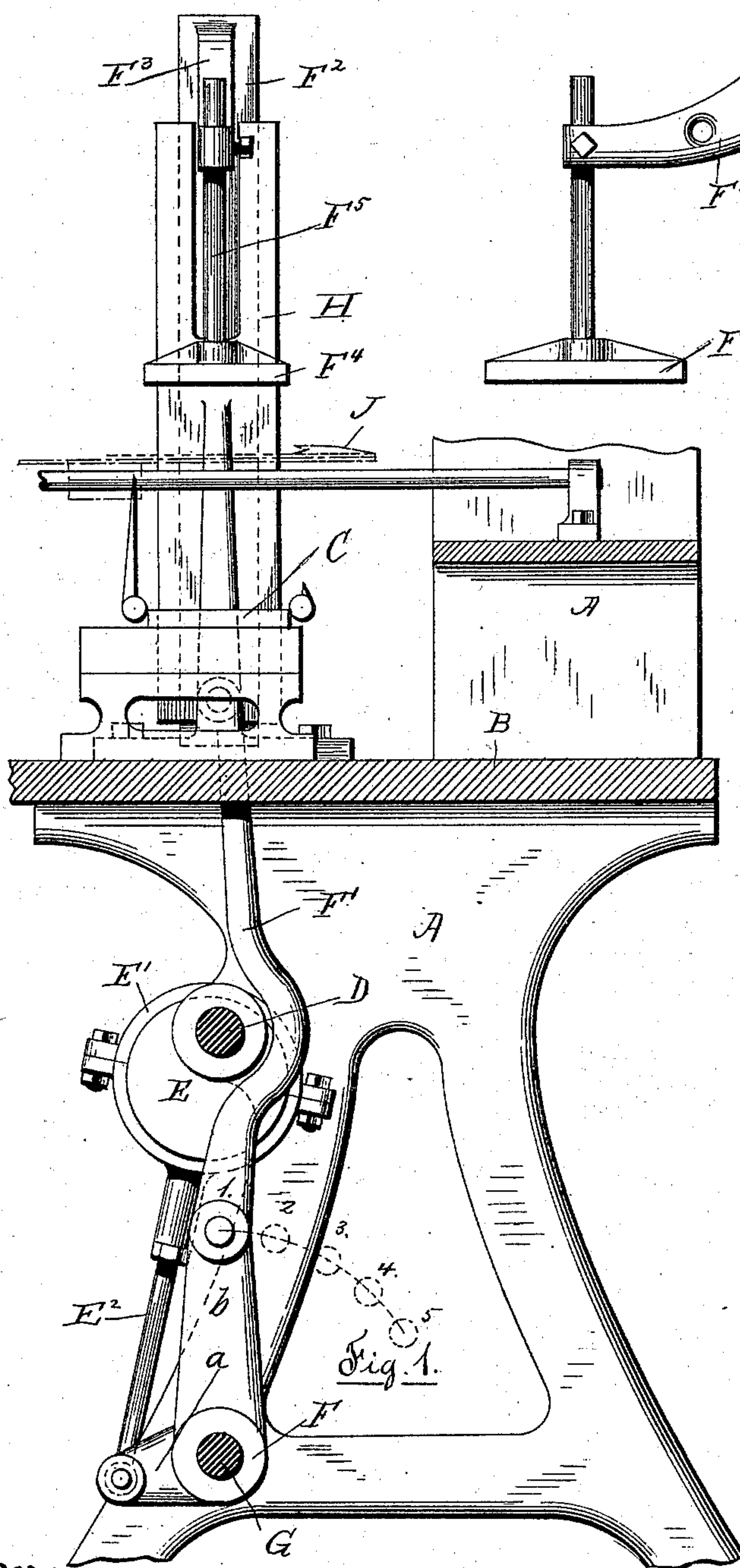


(No Model.)

H. D. & D. W. SWIFT.  
ENVELOPE MACHINE.

No. 470,632.

Patented Mar. 8, 1892.



Witnesses

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# UNITED STATES PATENT OFFICE.

HENRY D. SWIFT AND DANIEL WHEELER SWIFT, OF WORCESTER, MASSACHUSETTS.

## ENVELOPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 470,632, dated March 8, 1892.

Application filed August 17, 1888. Serial No. 283,040. (No model.)

*To all whom it may concern:*

Be it known that we, HENRY D. SWIFT and DANIEL WHEELER SWIFT, citizens of the United States, and residents of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Envelope-Machines, set forth in the annexed specification containing a full, clear, and exact description of the nature of our invention, accompanied by drawings showing such parts of an envelope-machine as embody our invention and which form a part of this specification, and in which—

Figure 1 represents a section of a portion of an envelope-machine, showing the parts of the machine to which our invention refers; and Fig. 2 is an end view of the same.

Similar letters and figures refer to similar parts in the different views.

Our invention relates particularly to that part of an envelope-machine employed in carrying the envelope-blank after it has been gummed downward upon the folding-bed; and it consists in the construction and arrangement of the operating mechanism by which the plunger is actuated, whereby the motion of the plunger is gradually accelerated in its downward movement and gradually retarded in its upward movement.

As our invention concerns only that portion of an envelope-machine by which the plunger is operated, we have shown those parts only in the accompanying drawings, in which—

A denotes the frame of the machine carrying the table B, to which the folding-bed C is secured.

D is the main driving-shaft journaled in the frame A and having near one end an eccentric E, the strap E' of which is connected by means of the rod E<sup>2</sup> with the short arm a of the bell-crank lever F, which is pivoted on the shaft or tie-rod G. The longer arm b of said bell-crank lever F supports one end of the connecting-rod F', the other end of which is pivoted to the vertical slide F<sup>2</sup>, sliding in ways H, secured on top of the table B. To the front side of the slide F<sup>2</sup> is attached the arm F<sup>3</sup>, in which the plunger-plate F<sup>4</sup> is supported by means of the rod F<sup>5</sup>.

It will be readily seen and understood that by the rotation of eccentric E the bell-crank

lever F will be caused to rock and the arm b will swing, so that the lower end of the connecting-rod will take the positions from 1 to 5, inclusive, as shown by the dotted lines in Fig. 1, and although the spaces between the two succeeding points are the same, yet the downward travel of the slide F<sup>2</sup> and its attached plunger F<sup>4</sup> will be slowest for the same amount of swing on part of the arm b between the points 1 and 2. Then it gradually accelerates until the highest speed is obtained between the points 4 5, the same ratio of travel being held for the return swing of the arm b, but in reversed order. It is therefore clear that the plunger starts on its downward travel at a comparatively low rate of speed and ends with a quick motion. Then returning it starts with a quick motion and ends its travel at low rate of speed, thus being in its higher position and therefore out of the way of the folders during almost three-quarters of a revolution on part of the shaft D.

It will be seen that equal angular motions of the arm b at the opposite ends of its swing will impart a different vertical motion to the slide F<sup>2</sup> and plunger F<sup>4</sup>, and this gradual acceleration of the plunger during its downward stroke and gradual retardation of the plunger during its upward stroke is produced by the relative angular relation of the arm b of the bell-crank F and connecting-rod F' with the plunger-slide F<sup>2</sup>, by which the arm b is made to assume a vertical position upon the "dead-point" at the end of the upward movement of the plunger, so that the successive angular movements of the arm b from 1 to 2, 2 to 3, 3 to 4, and 4 to 5 will produce an accelerated downward movement of the plunger and the reverse movement of the arm b between 1 and 5 will be accelerated toward the center and retarded toward each end of the arc 1 to 5 by the action of the eccentric E, which imparts to the arm a an angular motion, gradually accelerated at the beginning and gradually retarded at the end of its "throw." The plunger F<sup>4</sup> therefore possesses a compound motion, caused by the angular relation of the arm b and the connecting-rod F', modified by the angular movement of the arm b, as actuated by a bell-crank or eccentric on the shaft D.

The mechanism for actuating the carriage



J is not herein shown or described, as it forms no part of our present invention and because the arrangement and mode of operation of the carriage and related parts of the envelope-machine are well understood, being in common use in nearly all classes of envelope-machines now in use.

What we herein claim as of our invention, and desire to secure by Letters Patent, is—

10 1. In the folding mechanism of an envelope-machine, comprising a reciprocating plunger by which the envelope-blank is carried upon a folding table or bed, the combination, with  
15 said reciprocating plunger, of a rocking lever, to which an angular motion is imparted through connected actuating mechanism, substantially as described, and a connecting link or rod connecting said rocking lever with said reciprocating plunger, the angular relation of  
20 said connecting rod or link and said rocking lever being so arranged as to impart an accelerated movement to the reciprocating plunger as it approaches the folding-bed and a re-

tarded motion to said plunger upon its reverse movement, substantially as described. 25

2. In the folding mechanism of an envelope-machine, comprising a reciprocating plunger by which the envelope-blank is carried upon a folding table or bed, the combination, with said reciprocating plunger, of a rocking lever, 30 a link or rod connecting said rocking lever with said reciprocating plunger and having such angular relation to said rocking lever as to cause an accelerated movement of the plunger as it approaches the folding-bed and a re- 35 tarder movement of the plunger upon its reverse motion, and an actuating-eccentric operatively connected with said rocking lever, whereby said rocking lever is uniformly accelerated and retarded throughout its angu- 40 lar movement, substantially as described.

HENRY D. SWIFT.

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Witnesses:

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