(No Model.) 2 Sheets—Sheet 1.

W. H. PATTERSON.

PAPER BAG MACHINE.

No. 426,852. Patented Apr. 29, 1890.

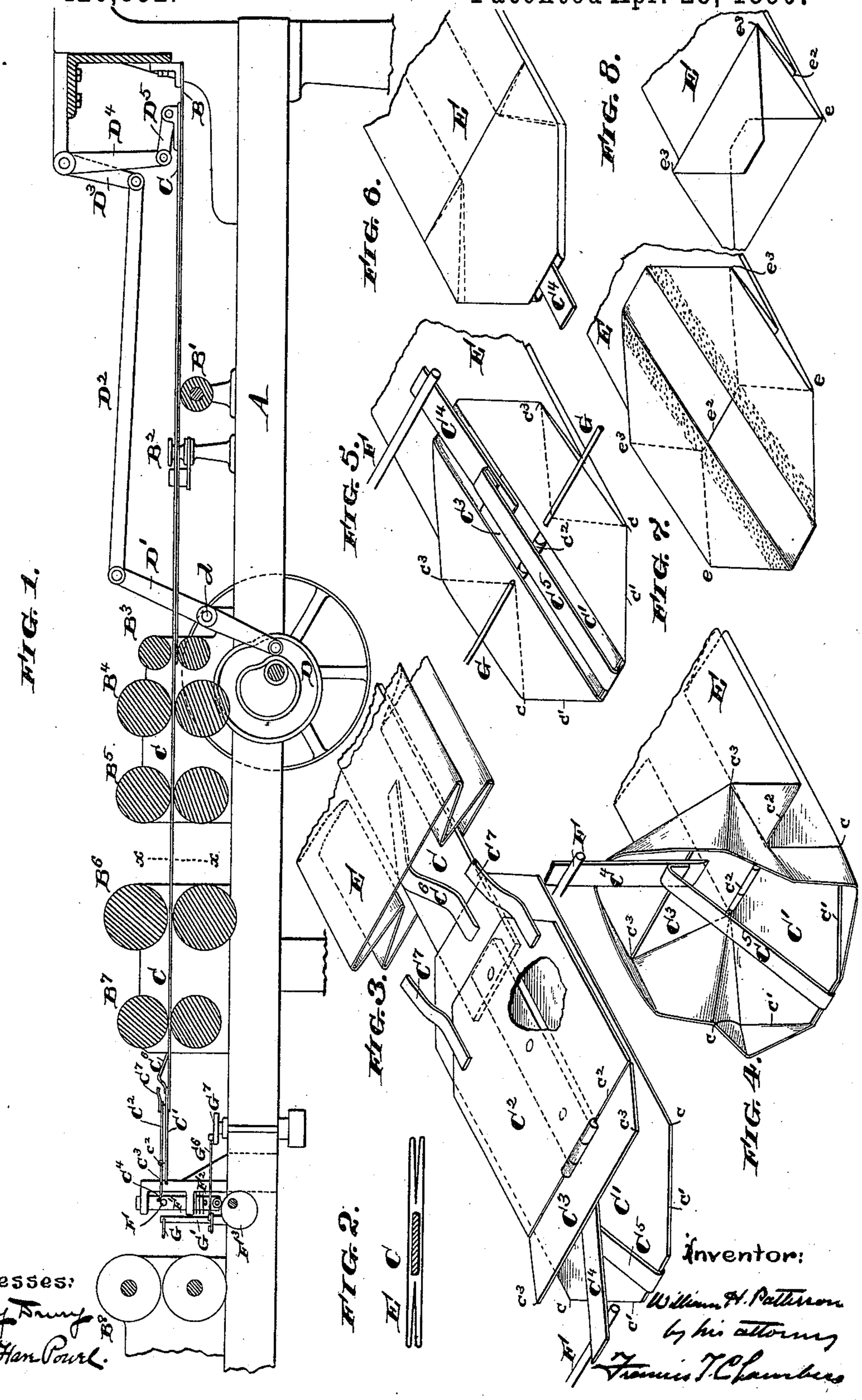

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

FIG. 7.

FIG. 8.

Witnesses:
Henry Fenny
H. W. Hanpour.

Inventor:
William H. Patterson
by his attorney
Francis T. Chambers

(No Model.) 2 Sheets—Sheet 2.

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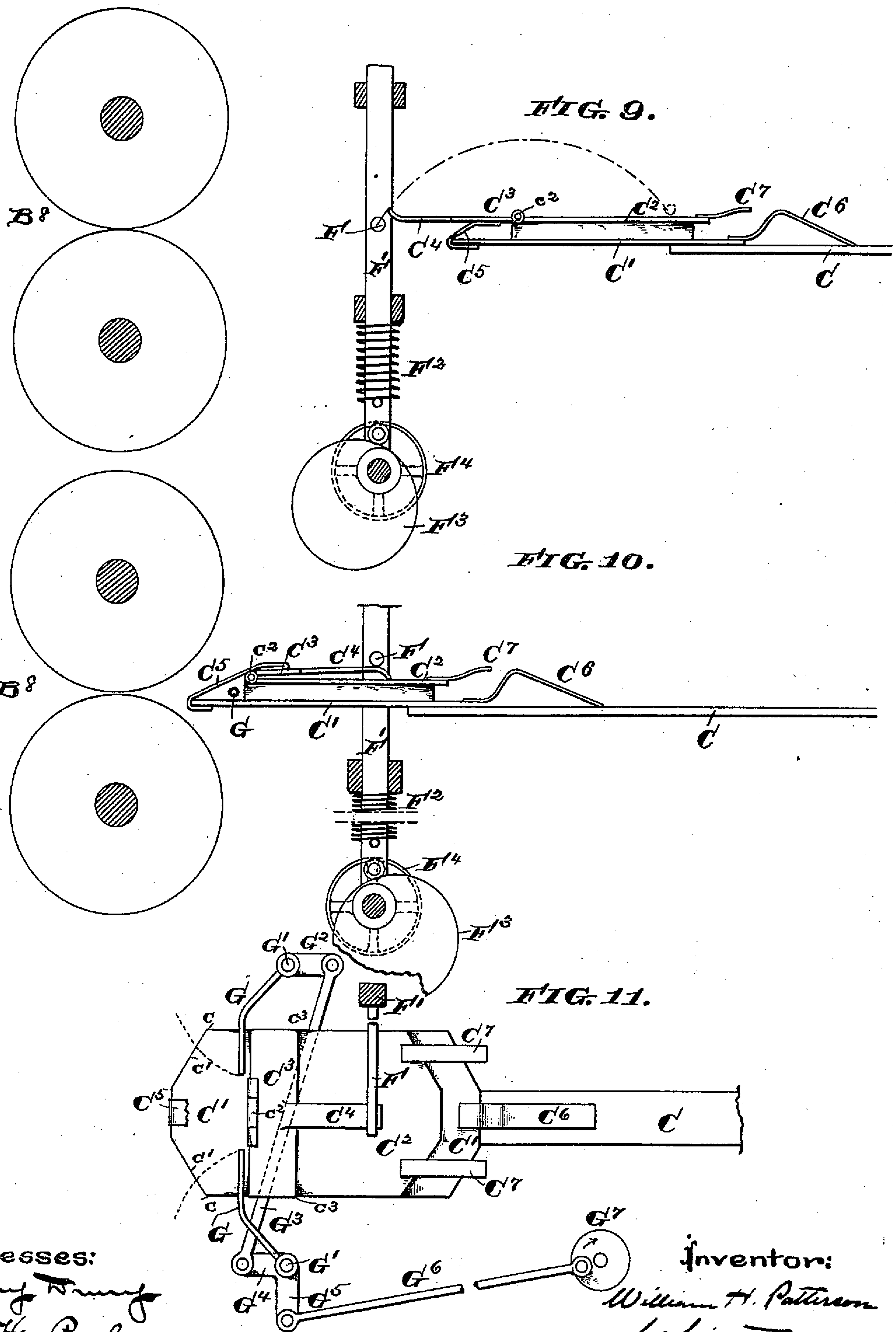

Witnesses:
Henry Drury
H. W. Van Powel.

Inventor:
William H. Patterson
by his attorney
Francis T. Chambers

UNITED STATES PATENT OFFICE.

WILLIAM H. PATTERSON, OF CLEVELAND, OHIO, ASSIGNOR TO THE UNION PAPER BAG MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 426,852, dated April 29, 1890.

Application filed January 16, 1890. Serial No. 337,082. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. PATTERSON, of Cleveland, county of Cuyahoga, State of Ohio, have invented a new and useful Paper-Bag Machine, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to machinery for making bellows-sided satchel-bottomed bags, and particularly to the mechanism for spreading out the "diamond fold" on the bottom of bellows-folded bag-blanks.

The nature of my invention will be best understood as described in connection with the drawings in which it is illustrated, and its novel features are hereinafter clearly pointed out in the claims.

In the drawings, Figure 1 is a side elevation of a portion of a bag-machine embodying my invention, the mechanism for folding down the corners of the diamond to complete the bag being omitted as forming no part of my present invention. Fig. 2 is a cross-section of the bellows-folded tube on the line x x of Fig. 1, showing the actuating-rod of my device. Fig. 3 is a perspective view of my device for spreading out the diamond. Fig. 4 shows in perspective the operation of my device on the blank. Fig. 5 is a similar view showing the diamond completely formed. Fig. 6 shows the last operation of my new device upon the blank. Fig. 7 shows in perspective the diamond-fold formed on the blank. Fig. 8 shows the bottom of the bag complete. Figs. 9 and 10 are enlarged side elevations of my diamond-fold-forming device in its two extreme positions, and Fig. 11 is a plan view of the same.

A is the frame of the machine.

B B′ B^2 B^3 B^4 B^5 B^6 B^7 B^8 indicate the ordinary tube forming, pressing, severing, &c., mechanism, which, as it forms no essential part of my invention, need not be described.

C is a reciprocating rod or bar passing through to the tube, as shown in Fig. 2, and upon the end of which my new device is secured. This rod is actuated in the plan shown by the cam D acting on one end of lever D′, pivoted at d and connected at its other end to a rod D^2, which by means of levers D^3 and D^4, situated on a common rock-shaft and link D^5, actuates rod C.

C′ is a former-plate, which, as shown, is secured to rod C, and at the front of which are formed corners c c, from which forward the edges c' c' are beveled inward, preferably at an angle of ninety degrees with each other. Above plate C′ is secured a plate C^2, to the front edge of which is secured a hinged plate C^3, the hinge c^2 being formed in a line distant from corners c c by a distance equal to half the breadth of the bellows-folded side of the blank, and said plate C^3 is provided with corners c^3 c^3, distant from the hinge by an equal amount. From the front of plate C^3 a tongue C^4 projects, and a spring—such as C^5—is provided to act so as to draw plate C^3 forward and downward.

C^6 is a bent finger arranged on plate C′, so as to open the blank advancing on rod C and insure the bellows-folds passing to the top of the said plate.

C^7 C^7 are fingers arranged to engage the bellows-folds and direct them beneath the plate C^2.

E is the bellows-folded blank. e^2 is the line on which said blank is spread open to form the diamond. e e are the forward corners of the inward triangular folds, which are the distinguishing features of this kind of bag. e^3 e^3 are the rearward corners of said fold.

F is a finger, which engages tongue C^4 and acts to move plate C^3 through the positions shown in Figs. 3, 4, and 5, said plate being returned to its first position by spring C^5. As shown, the finger F is attached to a rod F′, held down by spring F^2 and having an upward movement from the eccentric F^3, driven by pulley F^4, and the said eccentric is geared so as to raise finger F as the plate C′ and its attachments move forward, said finger having, therefore, a relative movement with respect to the plate, such as is indicated by the curved dotted line in Fig. 9. This relative movement is all that is essential, and the mechanism by which it is obtained may be changed and modified in any desired way.

G G are fingers secured on rock-shafts G′ G′, which are given a synonymous reciproca-

tion by connections—such, for instance, as are shown at G^2 G^3 G^4 G^5 G^6 G^7—the mechanism being such as will cause the fingers to move across the opened diamond fold when the plate C^3 is pushed back, as shown in Figs. 5 and 11, so as to insure the diamond folding on itself on the line e^2 when the finger F releases tongue C^4 and permits plate C^3 to fold down, as shown in Fig. 6.

The operation of my device is as follows: The blank having been formed is moved along rod C until it is delivered to the plates C′ C^2 C^3 and brought to a proper position thereon. The hinged plate C^3 is then turned up and back, as shown in Figs. 4 and 5, spreading out the diamond fold, as there also represented. The plate C^3 then moves forward again, folding the diamond as shown in Fig. 6, and the blank is then removed and the bag completed in any convenient way.

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

1. In a paper-bag machine, the device for spreading open the diamond fold on a bellows-sided blank, consisting of a plate C′, having corners *c c*, in combination with a plate C^2, secured above said plate C′, and a plate C^3, hinged to plate C^2 at a point behind corners *c* and distant from them by half the breadth of the sides of the blank, said plate having corners c^3 c^3, also at a distance from the hinge equal to half the breadth of the sides of the blank.

2. In a paper-bag machine, the device for spreading open the diamond fold on a bellows-sided blank, consisting of a plate C′, having corners *c c*, and beveled edges *c′ c′*, forming an angle of forty-five or more degrees with each other, in combination with a plate C^2, secured above said plate C′, and a plate C^3, hinged to plate C^2 at a point behind corners *c* and distant from them by half the breadth of the sides of the blank, said plate having corners c^3 c^3, also at a distance from the hinges equal to half the breadth of the sides of the blank.

3. In a paper-bag machine, the device for spreading open the diamond fold on a bellows-sided blank, consisting of a plate C′, having corners *c c*, in combination with a plate C^2, secured above said plate C′, a plate C^3, hinged to plate C^2 at a point behind corners *c* and distant from them by half the breadth of the sides of the blank, said plate having corners c^3 c^3, also at a distance from the hinge equal to half the breadth of the sides of the blank, a tongue C^4, extending from hinged plate C^3, a spring arranged to draw plate C^3 forward and downward, and mechanism, as specified, to lift plate C^3 upward and backward.

4. In a paper-bag machine, the device for spreading open the diamond fold on a bellows-sided blank, consisting of a plate C′, having corners *c c*, in combination with a plate C^2, secured above said plate C′, a plate C^3, hinged to plate C^2 at a point behind corners *c* and distant from them by half the breadth of the sides of the blank, said plate having corners c^3 c^3, also at a distance from the hinge equal to half the breadth of the sides of the blank, and fingers G, arranged, as described, to move substantially across the line of the hinge when the plate C^3 is folded back and to move away as said plate folds forward again.

5. In a paper-bag machine, the device for spreading open the diamond fold on a bellows-sided blank, consisting of a plate C′, having corners *c c*, in combination with a plate C^2, secured above said plate C′, a plate C^3, hinged to plate C^2 at a point behind corners *c* and distant from them by half the breadth of the sides of the blank, said plate having corners c^3 c^3, also at a distance from the hinge equal to half the breadth of the sides of the blank, a tongue C^4, extending from hinged plate C^3, a spring arranged to draw plate C^3 forward and downward, and mechanism, as specified, to lift plate C^3 upward and backward, and fingers G, arranged, as described, to move substantially across the line of the hinge when the plate C^3 is folded back and to move away as said plate folds forward again.

6. In a paper-bag machine, the device for spreading open the diamond fold on a bellows-folded blank, consisting of a reciprocating plate C′, having corners *c c*, in combination with a plate C^2, secured to and above said plate C′, a plate C^3, hinged to plate C^2 at a point distant from corners *e* by half the breadth of the sides of the blank and having corners c^3 c^3, formed on the front edge at the same distance from the hinge as corners *c c*, a spring arranged to press the hinged plate down and forward, a tongue C^4, attached to plate C^3, a finger F, situated, as specified, so as to engage tongue C^4 and press plate C^3 upward and backward, and fingers G G, actuated as specified and so as to move across the plate C′ to about the line of the hinge where plate C^3 is pressed back and to move away as said plate folds forward and down.

WILLIAM H. PATTERSON.

Witnesses:
THEODORE M. BATES,
JUSTUS L. COZAD.