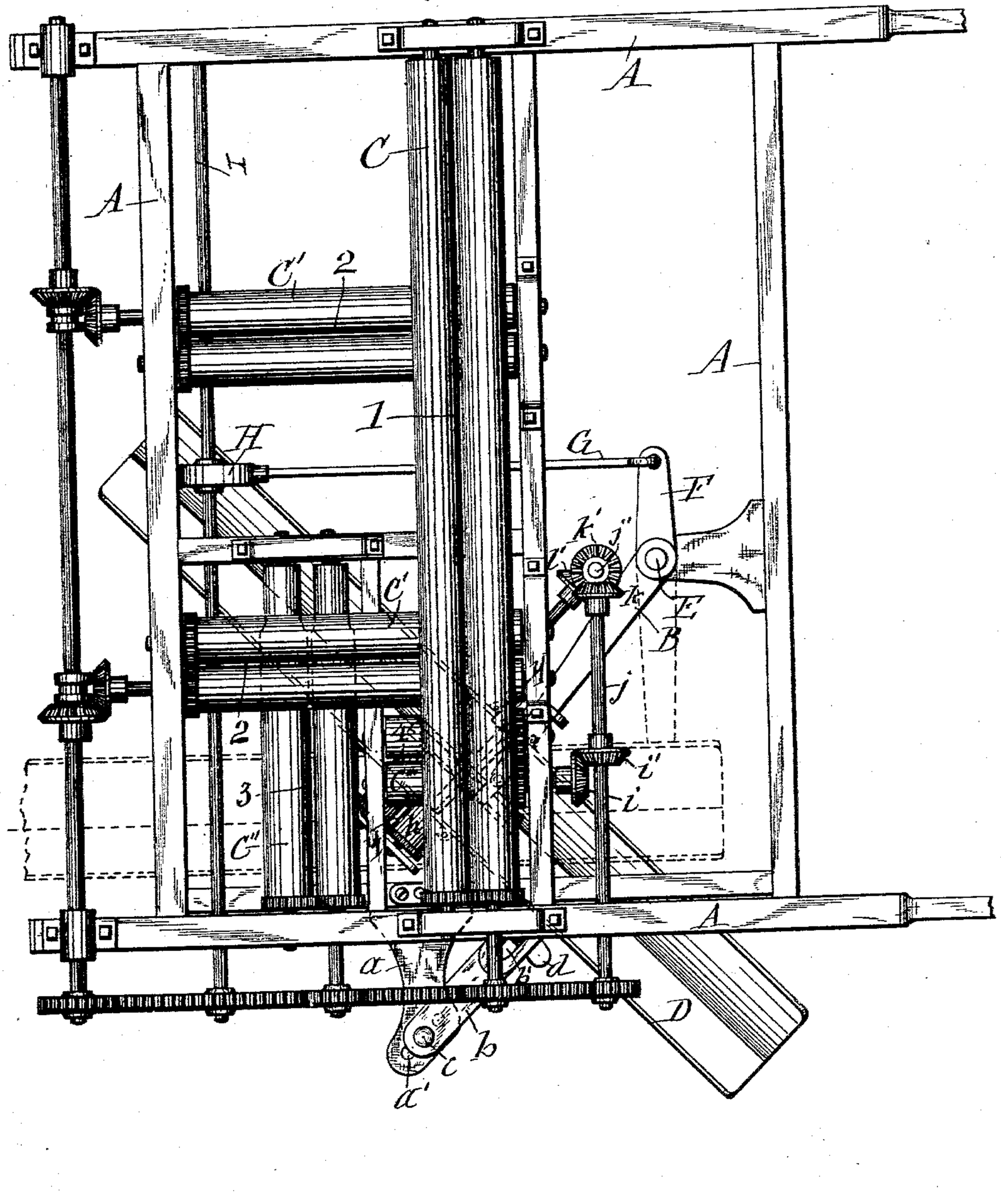
(No Model.) 5 Sheets—Sheet 1.

T. C. DEXTER.

PACKING BOX FOR PAPER FOLDING MACHINES.

No. 561,935. Patented June 9, 1896.

Fig. 1



WITNESSES:
C. L. Bendixon
A. M. Benedict.

INVENTOR:
Talbot C. Dexter
By E. Laass
his ATTORNEY

(No Model.) 5 Sheets—Sheet 2.

T. C. DEXTER.

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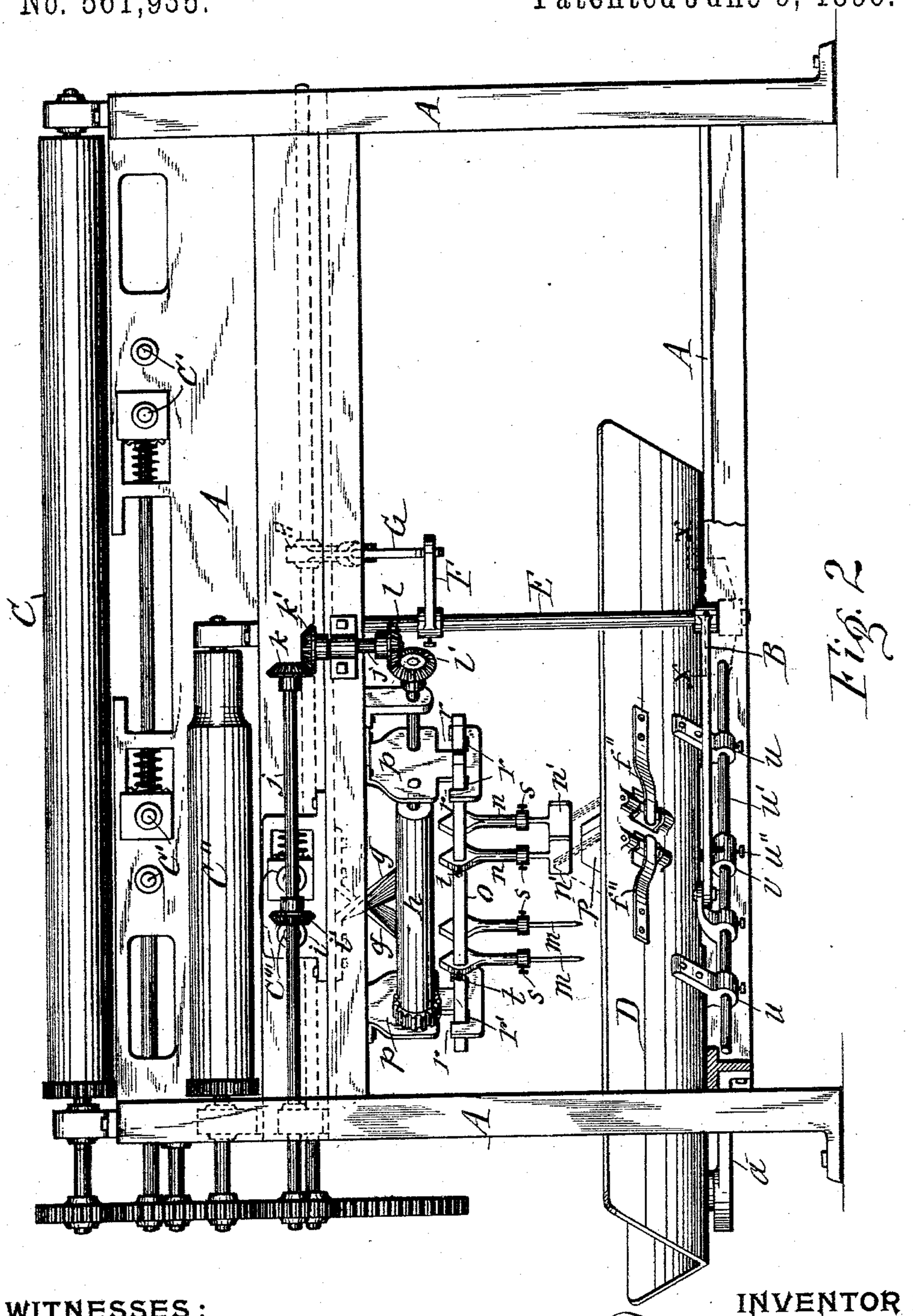

Fig. 2

WITNESSES:

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(No Model.) 5 Sheets—Sheet 3.

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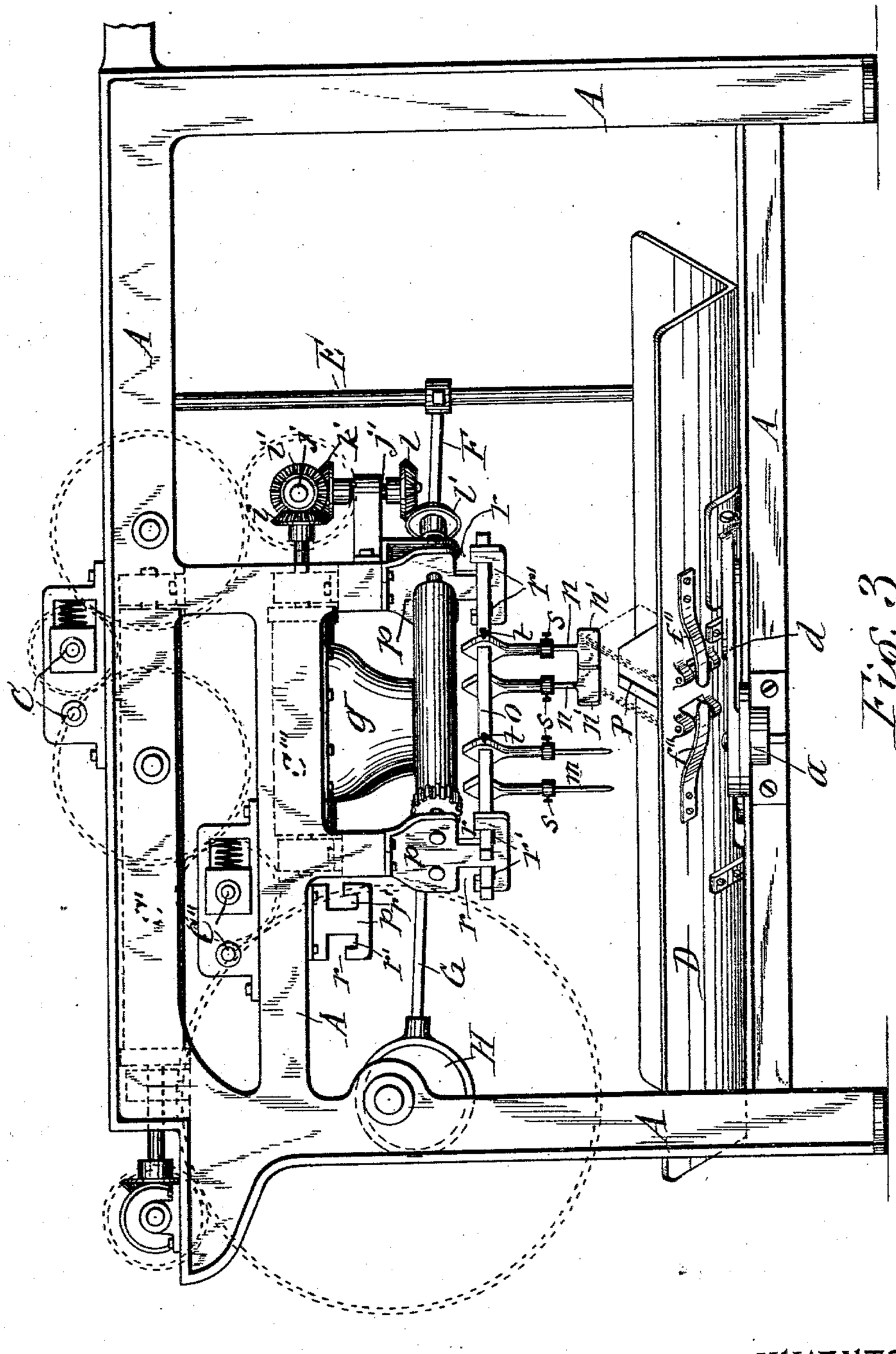

Fig. 3

WITNESSES:

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(No Model.) 5 Sheets—Sheet 4.

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PACKING BOX FOR PAPER FOLDING MACHINES.

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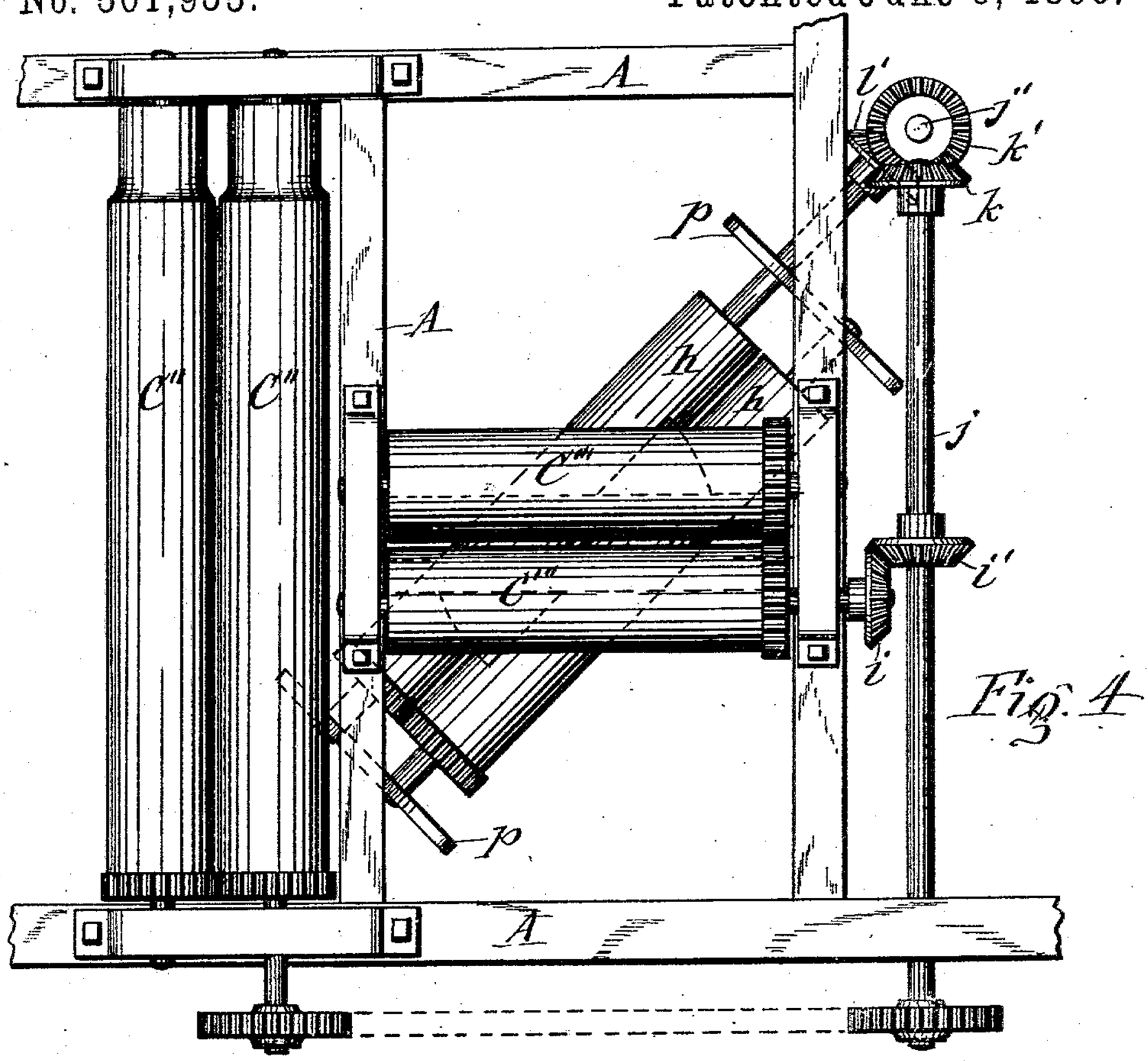

Fig. 4

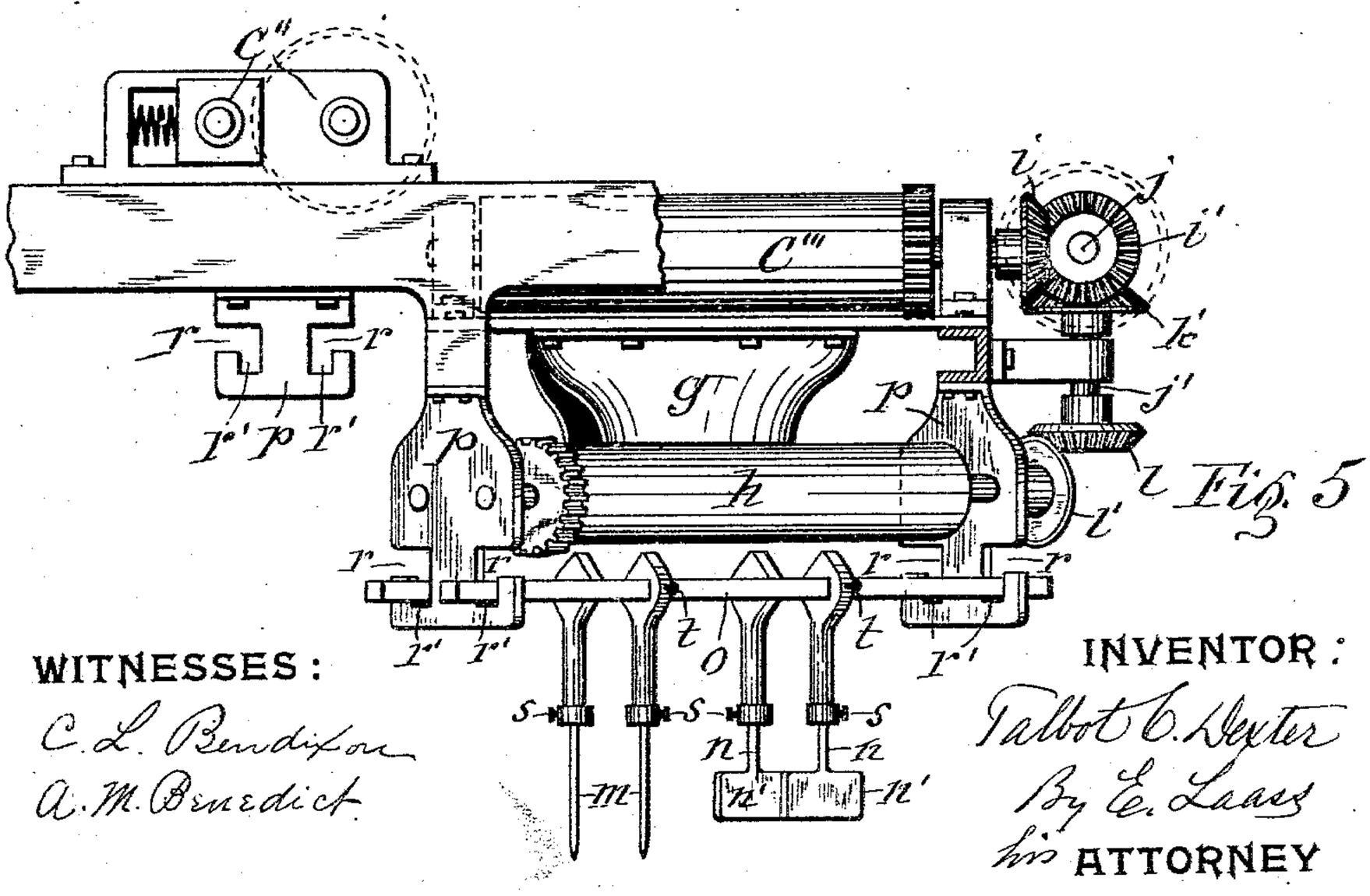

Fig. 5

WITNESSES:

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(No Model.) 5 Sheets—Sheet 5.

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PACKING BOX FOR PAPER FOLDING MACHINES.

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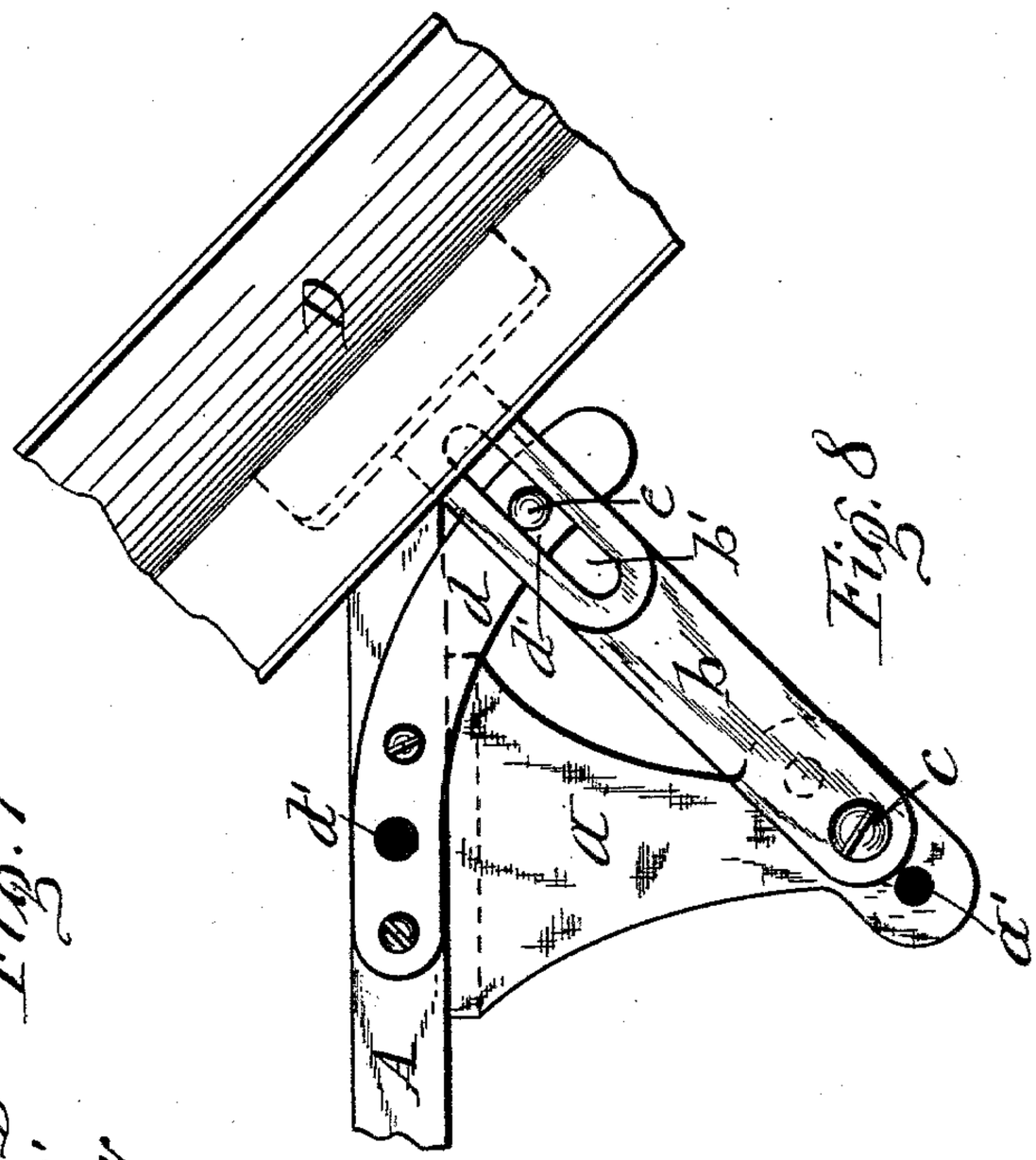

Fig. 8

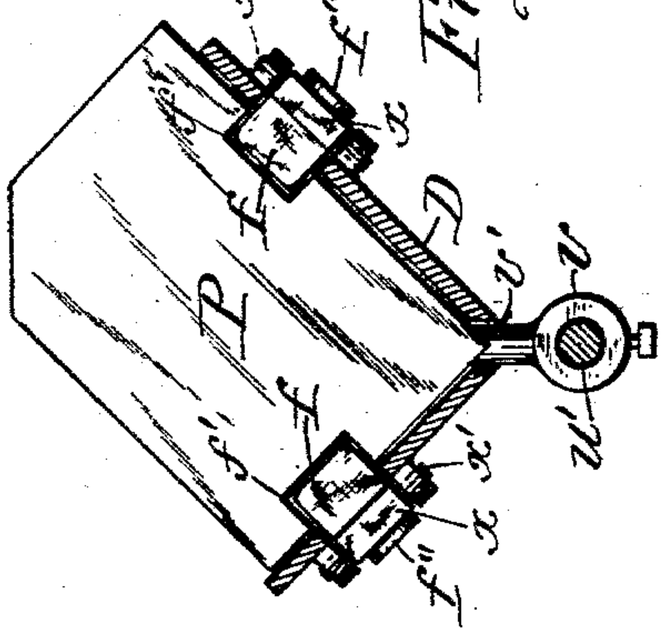

Fig. 7

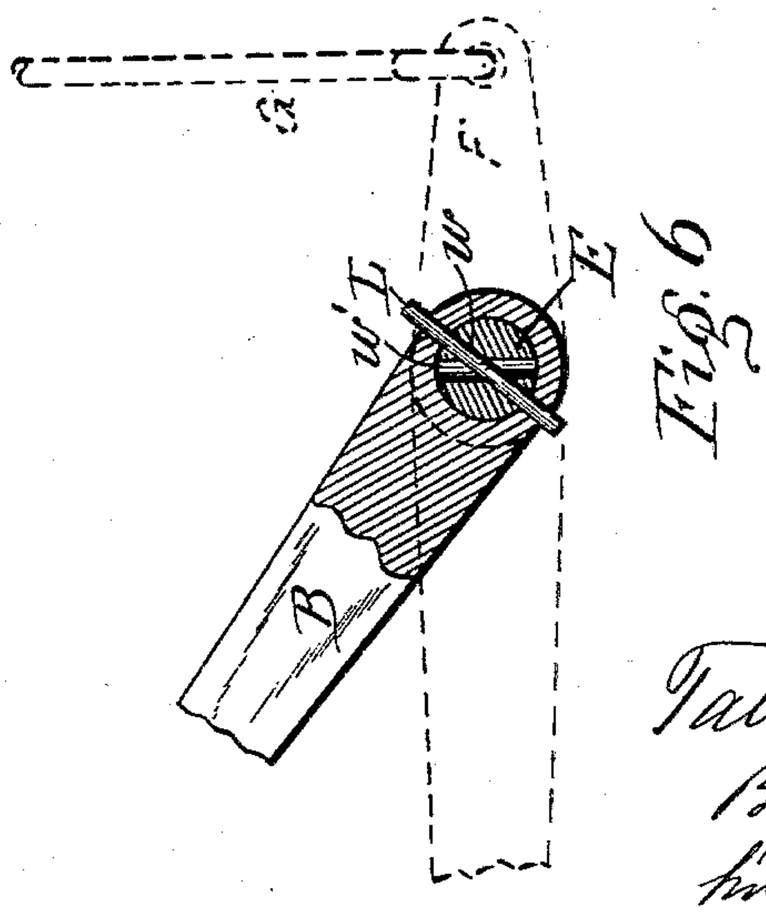

Fig. 9

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UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF PEARL RIVER, NEW YORK, ASSIGNOR TO THE DEXTER FOLDER COMPANY, OF NEW YORK, N. Y.

PACKING-BOX FOR PAPER-FOLDING MACHINES.

SPECIFICATION forming part of Letters Patent No. 561,935, dated June 9, 1896.

Application filed June 5, 1895. Serial No. 551,721. (No model.)

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, of Pearl River, in the county of Rockland, in the State of New York, have invented new and useful Improvements in Packing-Boxes for Paper-Folding Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention is a further improvement of the packing-box described in my prior application for Letters Patent, Serial No. 497,150, filed January 17, 1894, in which the packing-box is arranged adjustable to two positions at right angles to each other for the purpose of adapting it to receive the papers from either the third or the fourth fold rollers. By practical experience with said prior packing-box I have found that the adjustment thereof to positions at right angles to each other is objectionable for two reasons—to wit, first, it renders the operation of removing the folded papers from the packing-box very inconvenient, inasmuch as the right-angled position of the packing-box carried one of the end portions of said box so far from the side of the machine as to require a person to go under the machine to obtain access to said portion of the packing-box, and, secondly, on a folding-machine provided with the so-called "point-feed" the projection of the end of the packing-box from the side of the machine is in the way of the operator, who is required to stand close to said side of the machine and adjust the sheets of paper to the points which enter the slits in the sheet and thereby register the same preparatory to being passed to the folding-rolls.

The object of my present invention is to obviate the aforesaid defects; and to that end the invention consists in the combination, with a paper-folding machine having a plurality of folders at right angles to each other, of a packing-box pivoted to swing in a horizontal plane and a lock limiting said movement to or approximately to an angle of forty-five degrees and a spiral guide under one of the folders conducting the folded paper to the packing-box.

The invention also consists in the combination, with the packing-box and spiral guides arranged in relation to the folders in the manner aforesaid, of rolls compressing the folded sheet in its passage from the folding-rolls to the packing-box, so as to maintain the sheet in a compactly-folded condition.

It also consists in the combination, with the fold-rolls and packing-box, of brackets under the third and fourth fold rolls, horizontal bars detachably connected to said brackets, and paper-guides suspended from said bars; and the invention furthermore consists in certain novel auxiliary devices employed in connection with the packing-box, as hereinafter more fully described and specifically set forth.

In the annexed drawings, Figure 1 is a plan view showing by full lines the packing-box in position for receiving the paper from the fourth-fold rolls and by dotted lines in position for receiving the paper from the third-fold rolls. Figs. 2 and 3 are respectively end and side views of a folding-machine with the packing-box placed under the fourth-fold rolls. Fig. 4 is an enlarged plan view of the two sets of folding-rolls for which my invention is designed. Fig. 5 is a side view of the same. Fig. 6 is an enlarged transverse section on line X X in Fig. 2. Fig. 7 is a transverse section of the packing-box on line Y Y in Fig. 1, and Fig. 8 is a plan view of the stationary supporting-arm of the packing-box.

Similar letters of reference indicate corresponding parts.

Referring to Fig. 1 of the drawings, the lines marked, respectively, 1, 2, 3, and 4 indicate the locations of the usual folding-rolls and folding-blades, which are successively at right angles to each other and impart the four successive folds to the paper.

A represents the frame of the folding-machine.

C C′ C″ C‴ designate, respectively, the first, second, third, and fourth fold rolls. The two sets of rolls C′ C′, which are located at the lines 2 2 in Fig. 1, receive the paper slitted into two parts and fold said parts separately and simultaneously.

The folding-blades and mechanism for operating the same are well understood by those conversant with the art to which the machine pertains, and inasmuch as the arrangement

of said mechanism is immaterial to my present invention they are omitted on the drawings to better illustrate my improvements.

D represents the packing-box, which is adjustable in its position, so as to permit it to receive the paper from either the third-fold rolls C'' or the fourth-fold rolls C''', according to the adjustment of the machine, to impart either three or four foldings to the paper. To permit said adjustment of the packing-box, I rigidly secure thereto a laterally-extending plate *b*, which is pivoted at its free end to an arm *a*, which is rigidly attached to the lower portion of the frame A and is provided with a plurality of holes *a' a' a'* for the reception of the pin or bolt *c*, by which the plate *b* is pivoted to said arm. The portion of the plate *b* adjacent to the packing-box is provided with a longitudinal slot *b'* and rides on a horizontal segmental bearing *d*, secured to the frame A. This bearing *d* is provided with sockets *d'* for the reception of a pin *e*, inserted in the slot *b'*.

For receiving the papers from the third-fold rolls C'' the packing-box is placed at right angles to said rolls, as represented by dotted lines in Fig. 1 of the drawings, and when the machine is arranged to impart four foldings to the paper the packing-box is arranged diagonally, preferably at an angle of forty-five degrees, under the fourth-fold rolls C''', as shown by full lines in Fig. 1 of the drawings, and in these positions the packing-box is locked by the insertion of the pin *e* in the sockets *d'*. It will be observed that when the packing-box is placed diagonally under the machine the inner end portion thereof is sufficiently near to the side of the machine to afford ready access to said portion of the box for removing the papers therefrom. To properly conduct the folded sheets from the said fold-rolls to the diagonally-disposed packing-box, I place under the bite of said rolls suitable spiral guides *g g*, by which the paper issuing from between said rolls is gradually turned to carry the lower end toward a position at right angles to the packing-box D. To limit this turning movement of the folded paper and at the same time retain it in a compactly-folded condition during its passage to the packing-box, I place under the guides *g g* the compressing-rollers *h h*, which are also at right angles to the packing-box, and compress the folded paper in its passage between said rollers and direct said paper more positively in proper position to the packing-box.

One of rollers *h* is geared to receive positive rotary motion. This I preferably effect by a gear *i*, attached to an extension of the shaft of one of the folding-rolls and meshing with a gear *i'* on a horizontal shaft *j*, to which is attached a second gear *k*, meshing with a gear *k'*, secured to the upper end of a vertical shaft *j'*, to the lower end of which is attached a gear *l*, meshing with gear *l'* on the end of the shaft of one of the compressing-rollers *h*.

Under the rollers *h h* I suspend fingers *m n*, connected to bars *o o*, disposed parallel with and at opposite sides of the bite of the said compressing-rollers. The purpose of these fingers is to guide the paper all the way from the rollers to the packing-box, so as to overcome the tendency of the folded paper to spread its folds as soon as released from the pressure of the rolls. To allow these guiding-fingers to be used under the third-fold rollers C'', as well as under the fourth-fold rollers C''', I place under each of said rollers hangers *p p*, secured to the frame of the machine and provided in their vertical edges with notches *r r*, terminating with downward recesses *r' r'*, in which the ends of the bars *o o* are seated. The notches *r r* allow the bars to be readily inserted and removed from the recesses *r' r'*, and thus adapted to be shifted from under one set of rollers to another set when desired. The ends of the bars, as well as the recesses, are squared to prevent the bars from turning. Said fingers are adjustable, so as to enable them to properly perform their designed functions on papers of different sizes and under rollers at different elevations. For that purpose I form each of said fingers of two end sections spliced together adjustably by the upper end of the lower section inserted into a socket in the lower end of the upper section and clamped therein by a set-screw *s*, passing through the side of the socketed portion and engaging the inserted portion of the finger. The lower ends of the fingers *n* I terminate with vertical flat leaves *n'* for the purpose of bearing on the upper corners of the papers and sustaining the papers in the packing-box after the plunger P has pushed the papers past said fingers. Aside from the adjustment of the lengths of the aforesaid fingers they are also made adjustable longitudinally on their supporting-bars *o o*, which pass freely through eyes in the heads of the fingers, so as to allow said fingers to be shifted on the bars according to the size of the paper received from the folding-machine.

By means of the set-screws *t t*, connected to the heads of the fingers and engaging the bars *o o*, said fingers are retained in their desired position. To further sustain the sheets in proper positions in the packing-box D, I pivot to the exteriors of the sides of said box lips *f f*, which extend from square portions *x* of the shafts *x'* and play in openings *f' f'* in the sides of the box and are held yieldingly in a right-angled inward-projecting position by spring-plates *f''*, attached to the exterior of the box and bearing on the square shafts of the lips. These lips yield to the pressure of the packer P in pushing the folded paper toward the end of the box and allow said paper to pass beyond the lips, which spring back into their inward-projecting position as soon as the packer moves toward the opposite end of the box. This latter position of the lips retains the paper in the position in which it has been pushed by the packer. The shafts *x'* are sufficiently distant from the interior of

the packing-box to allow the lips *f* to yield as aforesaid without turning the shafts sufficiently to cause the springs *f''* to slip over the corners of the shafts. Said springs are thus caused to press the lips back to their normal inward-projecting positions.

The bottom of the packing-box has attached to it ears *u u*, in which slides the rod *u'*, to which the packer P is attached by an ear *v*, secured to the packer and passing through a longitudinal slot *v'* in the bottom of the box and receiving through it the rod *u'*, to which it is fastened by a set-screw *u''*. The rod *u'* receives a reciprocating motion by means of the arm B, secured at one end to the vertical rock-shaft E and connected at the opposite end to the aforesaid rod. The said rock-shaft is actuated by an arm F, connected at its end to a pitman G, which receives reciprocating motion from an eccentric H, attached to the rotary shaft I.

To allow the arm B to operate the packer P in the packing-box D, placed either under the third or under the fourth fold rolls, I make the arm B adjustable on the shaft E, so as to allow said arm to stand at different angles in relation to the arm F. This may be accomplished in the manner described in my prior application hereinbefore mentioned and as shown here in Fig. 6 of the drawings, in which the shaft E is provided with two keyways *w w'*, which are at an angle of about forty-five degrees to each other and adapted to receive the key L, by which the arm B is secured to the shaft E. Said key is removable to allow the arm to be turned on the shaft to bring the arm to its requisite position, in which it is then retained by inserting the key.

What I claim as my invention is—

1. A paper-folding machine comprising two pairs of rolls arranged one pair diagonally under the other paper-guides interposed between the two pairs of rolls and turning the paper in transit to the bite of the lower rolls and a packing-box under the latter rolls as set forth.

2. In combination with paper-folding rolls, a packing-box disposed diagonally under said rolls, spiral paper-guides leading from the folding-rolls, and paper-compressing rolls under said guides to receive the folded paper therefrom as set forth.

3. In combination with paper-folding rolls and a packing-box disposed diagonally under said rolls, paper-compressing rolls interposed between said folding-rolls and packing-box and arranged at right angles to said box and spiral guides leading from the folding-rolls to turn the folded paper and direct it to the compressing-rolls which pass it to the packing-box as set forth.

4. The combination with a paper-folding machine having a plurality of sets of folding-rolls disposed at right angles to each other, of a packing-box movable from under one set of said rolls to a position approximately under the next set of rolls, a lock limiting said movement of the packing-box to a position diagonally under one set of rolls, and spiral guides interposed between the latter rolls and diagonal packing-box as set forth.

5. The combination with the two sets of folding-rolls disposed at right angles to each other, of a packing-box pivoted to swing from under one set to approximately under the next of said sets of rolls, a lock limiting said movement of the packing-box to a position diagonally under the latter rolls, spiral guides immediately under said rolls and paper-compressing rolls under said guides disposed at right angles to the diagonal packing-box as set forth.

6. The combination, with the two sets of folding-rolls disposed at right angles to each other, of a packing-box pivoted to swing from under one of said sets of rolls to a position approximately under the next set of rolls, a lock limiting said movement of the packing-box to a position diagonally under the latter set of rolls, spiral guides interposed between said rolls and diagonal packing-box, brackets attached to the frame under both sets of folding-rolls, bars supported removably on said brackets, and paper-guiding fingers suspended from said bars as set forth.

7. The combination, with the two sets of folding-rolls disposed at right angles to each other, of a packing-box pivoted to swing from under one set to a position approximately under the next set of said rolls, a lock limiting said movement of the packing-box to a position diagonally under the last set of folding-rolls, spiral paper-guides directly under the latter rolls, paper-compressing rolls directly under said guides and at right angles to the packing-box, two sets of brackets attached to the frame respectively under the two sets of folding-rolls, bars movable from one to the other set of brackets and supported thereon, and paper-guiding fingers suspended from said bars as set forth.

8. In combination with the main frame, two sets of folding-rolls in different horizontal planes and a packing-box movable from one to the other of said set of rolls, two sets of brackets respectively under the two sets of rolls, horizontal bars movable from one to the other set of brackets, and paper-guiding fingers suspended from said bars and adjustable in length as set forth.

9. In combination with the main frame, two sets of folding-rolls in different horizontal planes and a packing-box movable from one to the other of said sets of rolls, two sets of brackets respectively under the two sets of rolls, horizontal bars movable from one to the other of said sets of brackets and pendent paper-guiding fingers connected to said bars adjustably lengthwise thereof and composed of two end sections spliced together adjustably lengthwise of the fingers as and for the purpose set forth.

10. In combination with the main frame, two

sets of folding-rolls in different horizontal planes and a packing-box movable from one to the other of said sets of rolls, two sets of brackets respectively under the two sets of rolls and each of said brackets having in its two vertical edges notches terminating with square recesses, bars having square ends seated in said recesses and removable through the notches and pendent paper-guiding fingers connected to said bars adjustably lengthwise thereof and composed of end sections spliced together adjustably lengthwise of the fingers substantially as set forth.

11. In combination with the frame and two sets of folding-rolls disposed at right angles to each other and in different horizontal planes, a packing-box pivoted to swing from under one set of rolls to a position diagonally under the other set of rolls, spiral paper-guides immediately under the latter rolls, paper-compressing rolls under said guides, two sets of brackets respectively under the two sets of rolls, horizontal bars movable from one set to the other set of brackets and pendent paper-guiding fingers connected to said bars adjustably lengthwise thereof and composed of end section spliced together adjustably lengthwise of the fingers substantially as described and shown.

12. In combination with the folding-rolls and a packing-box disposed diagonally under said rolls, spiral paper-guides interposed between said rolls and box and paper-compressing rolls under said guides, a train of gears transmitting positive motion from the folding-rolls to one of the compressing-rolls as set forth.

13. In combination with two sets of folding-rolls disposed at right angles to each other, a packing-box pivoted to swing from under one set to a position diagonally under the other set and means of locking said box in its required position, a rock-shaft having two key-seats arranged diagonally in relation to each other, an arm connected adjustably to said rock-shaft by the key inserted in one of the aforesaid seats and a rod connecting said arm to the packer of the packing-box as set forth.

14. The combination with the frame and two sets of folding-rolls disposed at right angles to each other, the arm *a* attached to the frame and provided with a plurality of holes *a' a' a'*, the pin *c* movable from one to another of said holes, the segmental bearing *d* secured to the frame and provided with the sockets *d' d'*, the plate *b* pivoted to the pin *c* and riding on the bearing *d* and provided thereat with the longitudinal slot *b'*, the pin *e* passing through said slot and entering one of the aforesaid sockets and the packing-box D secured to the plate *b* substantially as described and shown.

In testimony whereof I have hereunto signed my name this 15th day of May, 1895.

TALBOT C. DEXTER. [L. S.]

Witnesses:
JAS. A. WHITLOCK,
V. E. MARSH.