No. 841,075. PATENTED JAN. 8, 1907.

C. C. DAVIS.

PAPER BOX MACHINE.

APPLICATION FILED APR. 23, 1906.

4 SHEETS—SHEET 1.

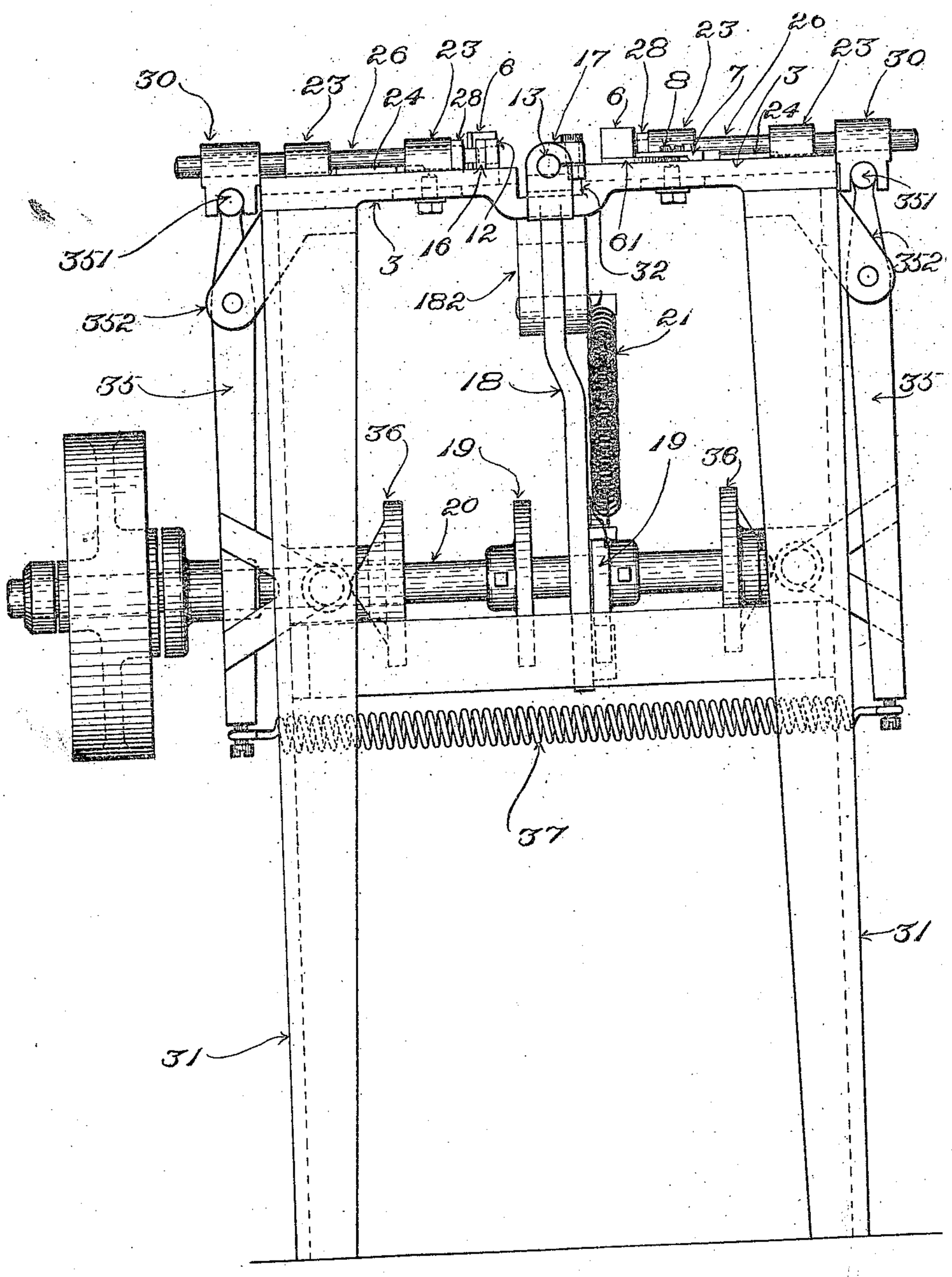

Fig. 1.

Witnesses:
Oscar F. Hill
Edith J. Anderson.

Inventor:
Charles C. Davis
by Chas. F. Randall
Attorney.

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4 SHEETS—SHEET 2.

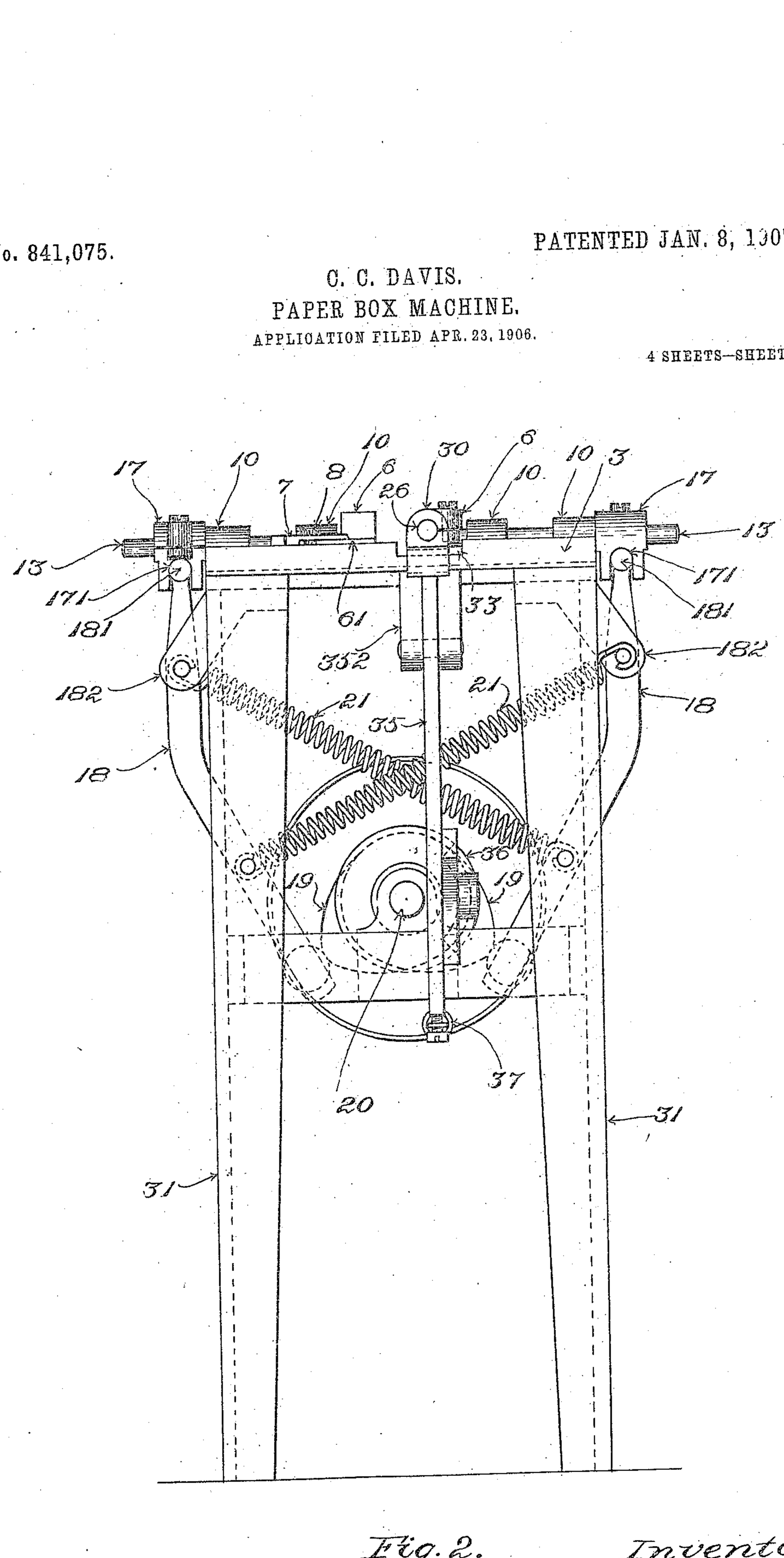

Fig. 2.

Witnesses:
Oscar F. Hill
Edith J. Anderson.

Inventor:
Charles C. Davis
by Chas. F. Randall
Attorney.

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Fig. 3.

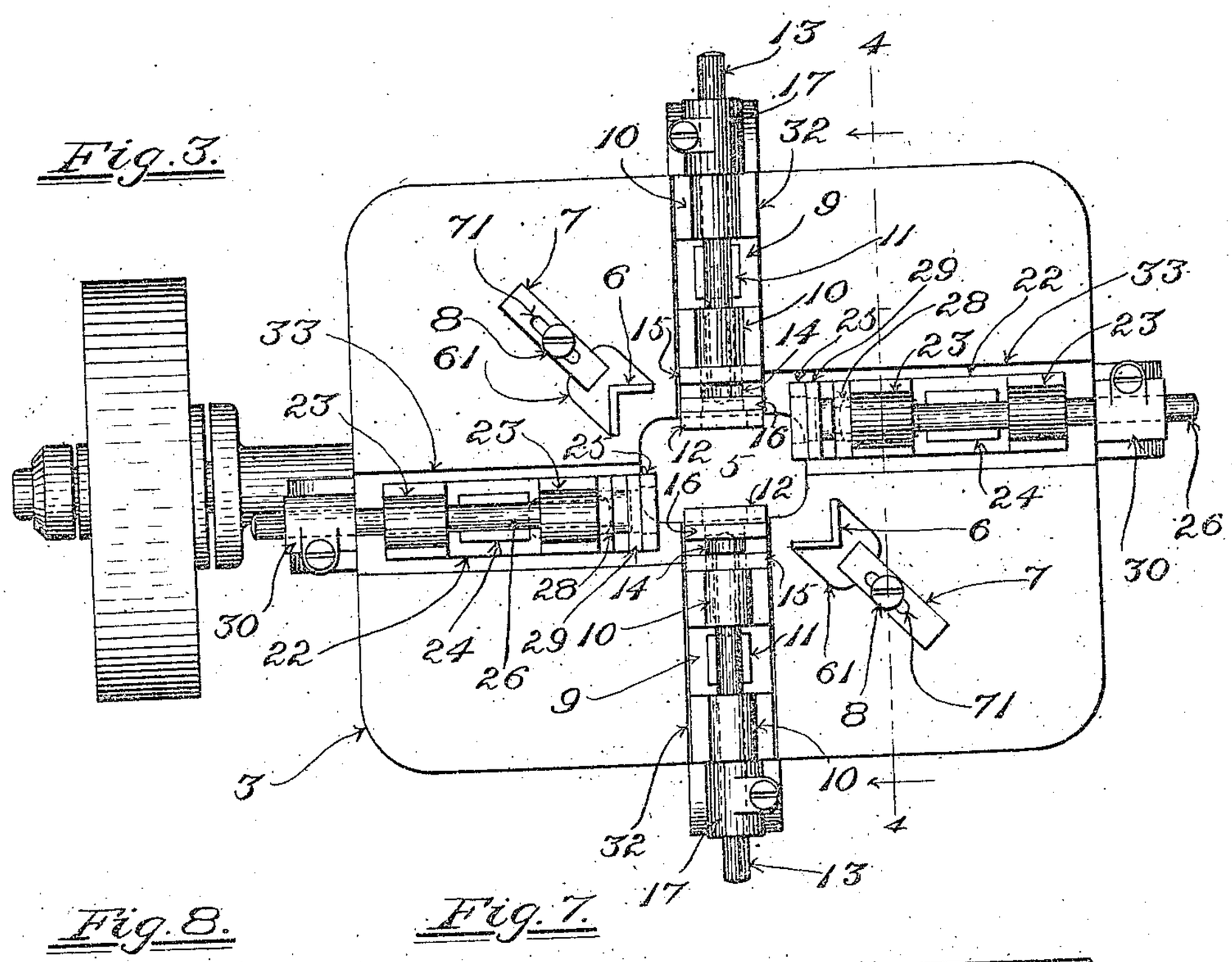


Fig. 8.

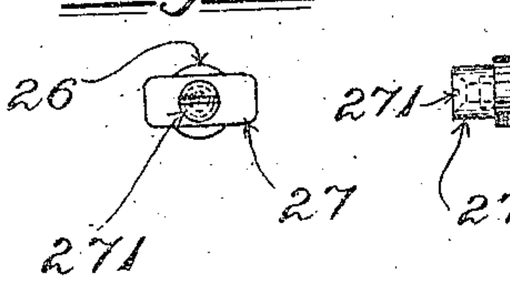
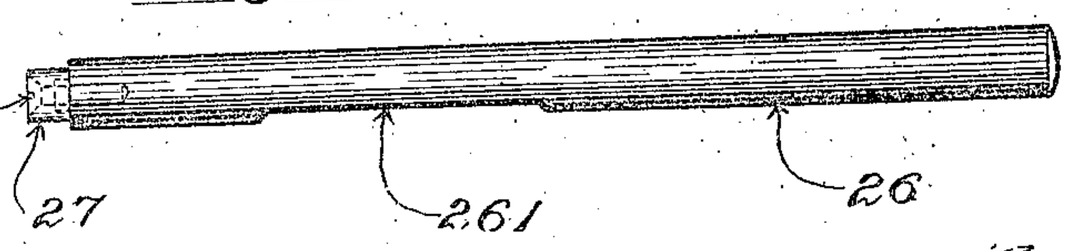


Fig. 7.



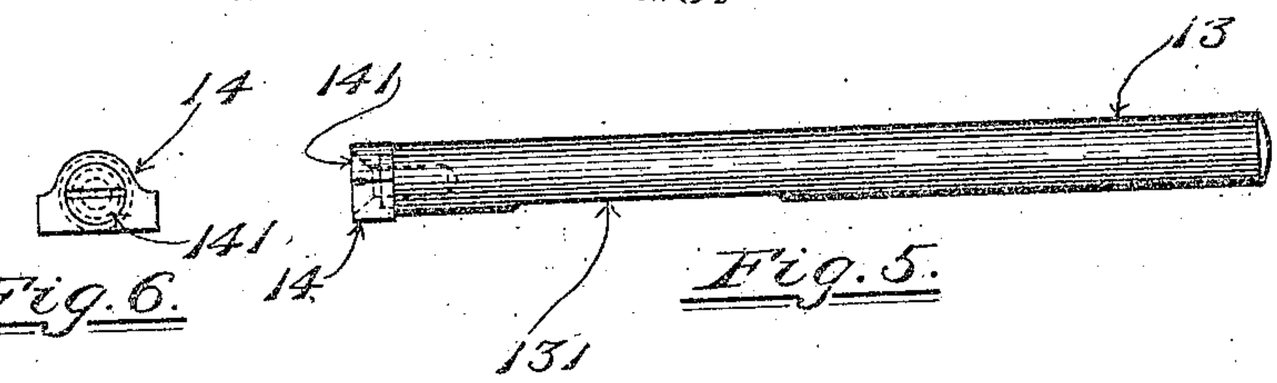


Fig. 6.

Fig. 5.

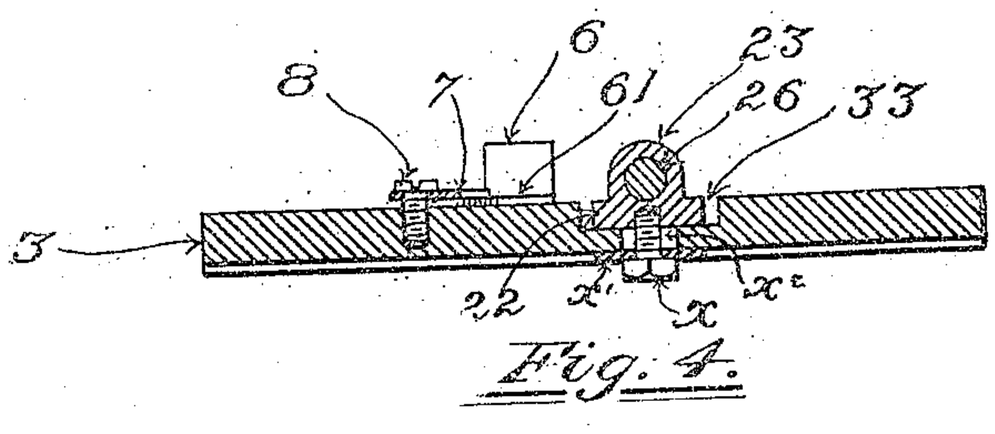


Fig. 4.

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Edith J. Anderson.

Inventor:
Charles C. Davis
by Chas. F. Randall
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4 SHEETS—SHEET 4.

Fig. 9.

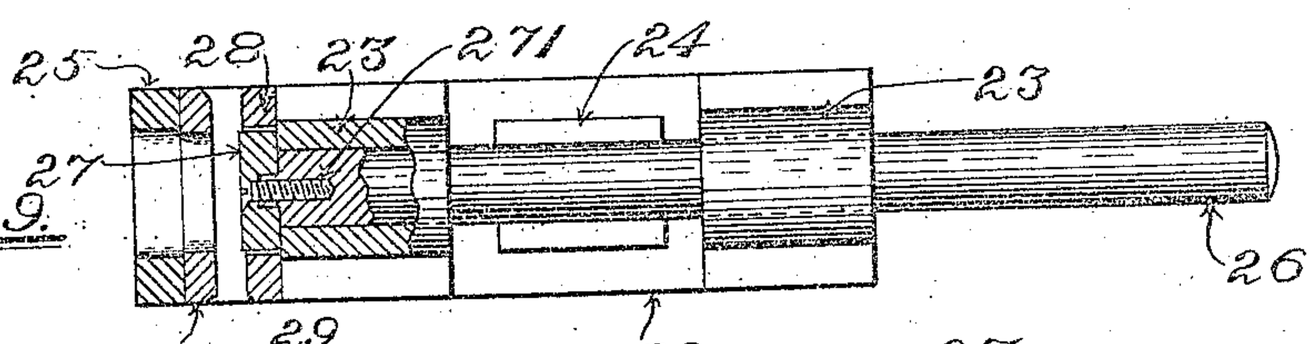


Fig. 10.

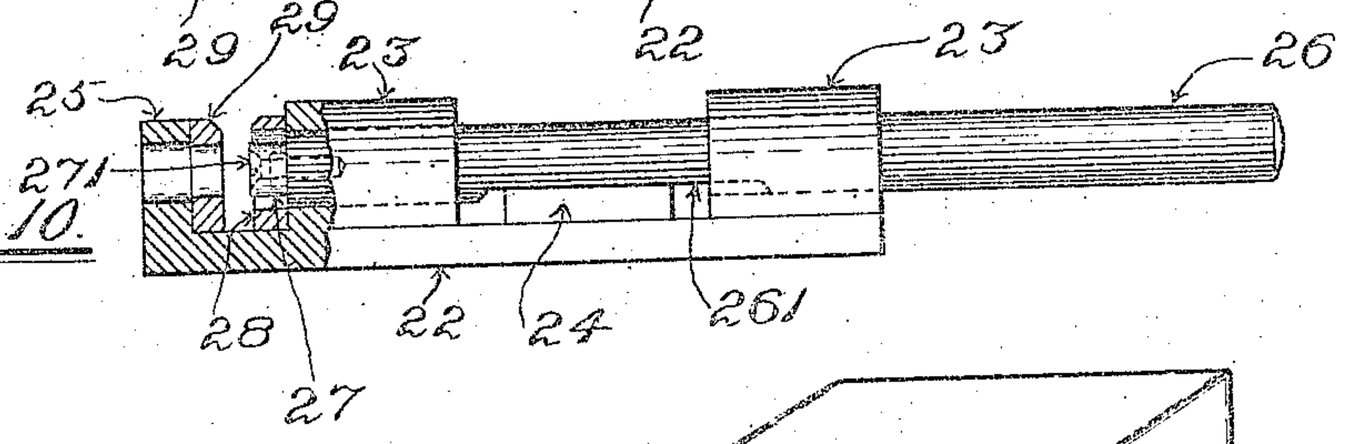


Fig. 11.

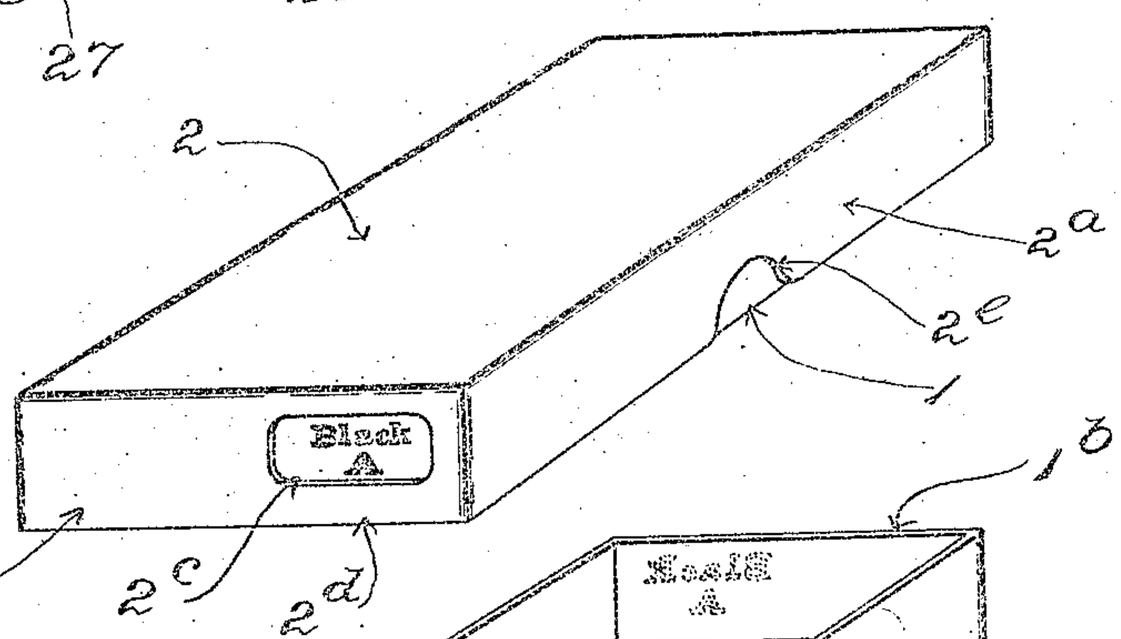


Fig. 12.

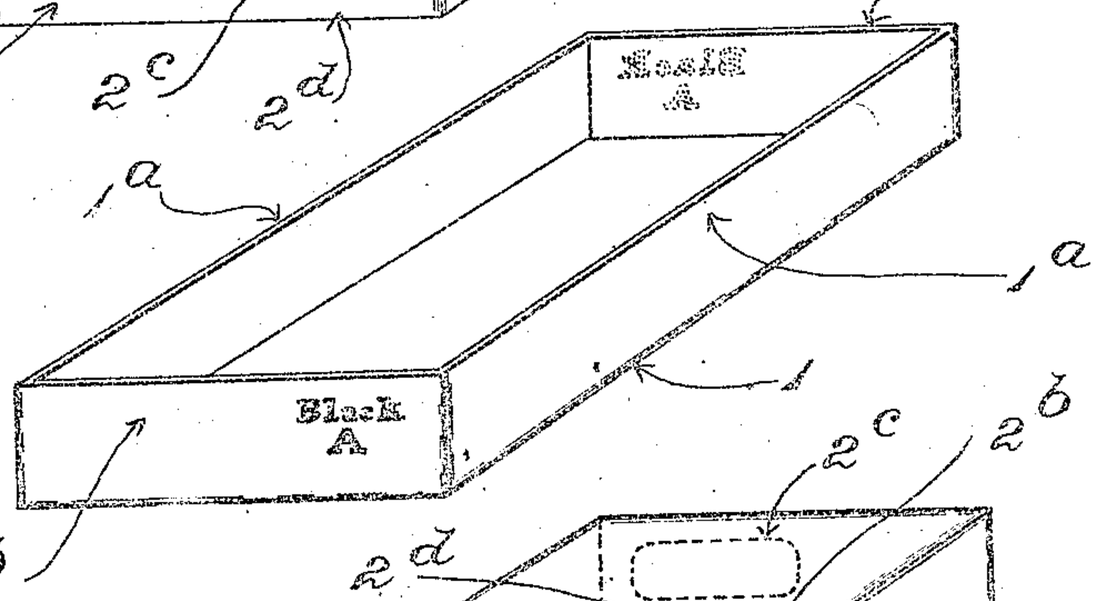
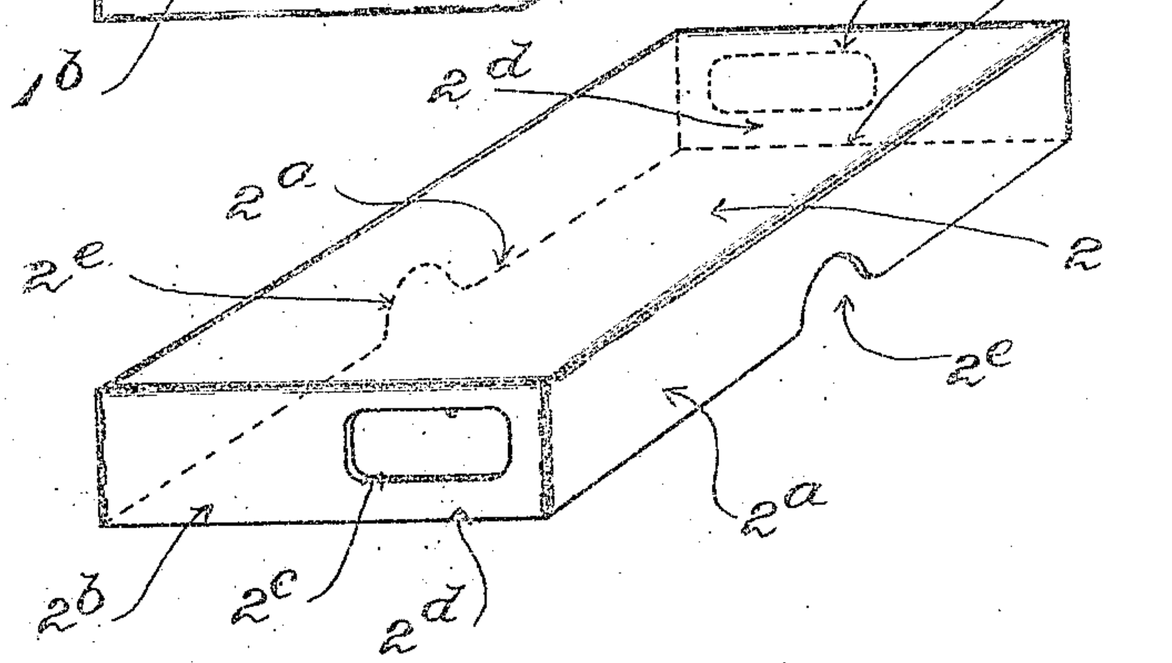


Fig. 13.



Witnesses:
Oscar F. Hill
Edith J. Anderson.

Inventor:
Charles C. Davis
by Chas. F. Ramsdell
Attorney.

UNITED STATES PATENT OFFICE.

CHARLES C. DAVIS, OF CONTOOCOOK, NEW HAMPSHIRE, ASSIGNOR TO THE KINGSBURY BOX & PRINTING COMPANY, OF NORTHAMPTON, MASSACHUSETTS, A CORPORATION OF CONNECTICUT.

PAPER-BOX MACHINE.

No. 841,075. Specification of Letters Patent. Patented Jan. 8, 1907.

Application filed April 23, 1906. Serial No. 313,113.

To all whom it may concern:

Be it known that I, CHARLES C. DAVIS, a citizen of the United States, residing at Contoocook, in the county of Merrimack, State of New Hampshire, have invented a certain new and useful Improvement in Paper-Box Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

Spool-silk is packed for the retail trade in pasteboard boxes, each comprising a body or tray and a cover. In the preferred form of the boxes which are employed for the purpose the cover has flanges which extend down around and inclose the side and end flanges of the body or tray, concealing the latter. It has been proposed to apply to the end flanges of the body or tray imprints or markings designating the size and color of the contents thereof in order to identify the said color and size and to form in the opposite ends of the cover openings or peep-holes through which the said markings or imprints will be visible when the cover is in place upon the body or tray, thereby enabling the marking of the cover itself to be dispensed with, if desired, and obviating all liability to the placing of wrongly-marked covers upon given box bodies or trays after removal of the covers from the latter in making display of the contents in effecting a sale or for other purposes.

The object of my invention is to facilitate the manufacture of box-covers having the said openings or peep-holes in the flanges of the same and also having so-called "thumb-holes" in the opposite side flanges of a box-cover, at the lower edges thereof, to facilitate the operation of separating a box body or tray and its cover from each other by permitting the box body or tray to be grasped and held at opposite sides thereof by the finger and thumb of one hand placed within the said open thumb-holes, while the box-cover is grasped by the other hand and lifted off thereby.

The invention consists in a novel machine by means of which the openings or peep-holes and thumb-holes are all punched at one operation in the respective flanges of a box-cover.

The invention is illustrated in the accompanying drawings, which latter represent a box provided with a cover having the openings or peep-holes and thumb-holes aforesaid formed in its flanges and also represent a machine containing one embodiment of the invention.

In the drawings, Figure 1 is a front elevation of the said machine. Fig. 2 is an end elevation thereof. Fig. 3 is a plan thereof. Fig. 4 is a view in section in the plane indicated by the dotted line 4 4, in Fig. 3. Fig. 5 shows in side elevation one of the movable thumb-hole dies and its carrying-plunger. Fig. 6 is a view thereof looking from the left-hand side in Fig. 5. Fig. 7 shows in side elevation one of the movable peep-hole dies and its carrying-plunger. Fig. 8 is a view thereof looking from the left-hand side in Fig. 7. Fig. 9 is a plan view, on an enlarged scale, partly broken away, of one of the sets of devices for punching the openings or peep-holes in the end flanges of a box-cover. Fig. 10 is a partly sectional side elevation thereof. Fig. 11 is a perspective of a box such as has been mentioned hereinabove. Fig. 12 is a perspective of the box body or tray. Fig. 13 is a perspective of the box-cover.

Having reference to the drawings, in Figs. 11 and 12, 1 designates a box body or tray. The upright side flanges of the said box body or tray are designated 1^a 1^a, and 1^b 1^b are the upright end flanges thereof. The name of the color of the intended contents of the box and the letter which indicates the size of such contents are marked upon the outer surfaces of the end flanges 1^b 1^b.

In Figs. 11 and 13 the box-cover is designated 2, the depending side flanges thereof being shown at 2^a 2^a and the depending end flanges thereof being shown at 2^b 2^b. In the said figures the opening, peep-hole, or "window," as it sometimes is termed, that is formed in each of the end flanges 2^b 2^b is designated 2^c. At 2^d is the integral bar that is left below the said opening, peep-hole, or window to keep the lower edge of the end flange 2^b intact, and thereby strengthen the same. The thumb-hole that is formed in the free lower edge of each depending side flange 2^a of the cover 2 is shown at 2^e in Figs. 11 and 13.

Referring now to the machine, at 3, Figs. 1, 2, and 3, is the bed-plate of the machine, and at 31 31, Figs. 1 and 2, are legs or uprights by

which the bed-plate is supported. The bed-plate is formed with oppositely-located grooves 32 32, Figs. 1 and 3, extending from opposite sides of the bed-plate toward the center thereof and within which are mounted the thumb-hole-punching devices, presently to be described. It is formed also with opposite grooves 33 33, Figs. 2 and 3, extending from the opposite ends of the bed-plate toward the center of the latter and within which are located the devices, presently to be described, for punching the openings, peep-holes, or windows aforesaid. At its center the bed-plate is formed with an opening 5, Fig. 3, extending vertically therethrough, for the escape of the punchings or chips. To the bed-plate 3 are applied positioning devices for the covers which are to be punched, such devices comprising in the present instance corner-guides 6 6, Figs. 1, 2, and 3, having upright portions which respectively are angularly shaped in cross-section to receive within the same the corner portions of a box-cover which is to be operated upon, there being in this case two of the said corner-guards arranged in position to receive diagonally opposite corners of a box-cover. In order to hold the corner-guides in position with convenient capacity for universal adjustment in a horizontal plane, each thereof is furnished with a foot portion or flange 61, projecting horizontally therefrom. This foot portion or flange 61 is engaged by a clamp 7, the inner end of which rests upon the upper surface of the foot portion or flange 61, while the outer portion of the said clamp, which portion of the clamp is somewhat thicker than the inner portion thereof, rests upon the surface of the bed-plate itself, as shown best in Figs. 1 and 2. The clamp has combined therewith a cap-screw 8, the stem of which passes through a slot 71 in the clamp into a threaded hole which is tapped in the bed-plate. By means of the said cap-screw the foot portion or flange of the corner-guide may be compressed firmly between the clamp and the bed-plate, and thereby the corner-guide may be secured in the desired position. The slot 71 extends longitudinally of the clamp, as shown in Fig. 3, to permit adjustment of the clamp itself toward and from the center. As will be obvious, when the cap-screw is loosened the corner-guide may be shifted toward or from the center and may be turned or swung in any direction into any required position to accommodate a wide range of variations in the size of the boxes operated upon, after which by tightening the cap-screw the corner-guide may be secured fixedly in place.

The thumb-hole-punching devices are located at opposite sides of the machine. The said devices comprise at each of the said sides a stand 9, Fig. 5, occupying the groove 32 at such side, the said stand having cast-iron boxes 10 10, Figs. 2 and 3, secured thereto and being provided with a fixed guide-block 11, Fig. 3, intermediate the said boxes and with an upright end portion 12 at the inner end of the stand. The punch-carrying rod 13 slides in the said boxes 10 10 and is flatted at 131, Fig. 5, at its under side to fit the top surface of the said guide-block 11. By the contact of the flatted surface 131 of the rod 13 with the top surface of the guide-block 11 the punch-carrying rod is held from turning. The thumb-hole punch or male die 14 is attached, by means of a screw 141, Figs. 5 and 6, to the inner end of the rod 13. In the retracted position of the rod 13 and die or punch 14 the said die or punch is shielded within a guard-block 15, Fig. 3. The fixed internal or female die 16, Fig. 3, is backed up by the upwardly-extending portion 12 of the stand 9. It is separated from the guard-block 15 by a space of sufficient width to receive between the same and the said guard-block one of the side flanges of a box-cover when the male die or punch 14 is retracted outwardly into the opening of the guard-block 15. For the actuation of the rod 13 and its punch or die 14 a clamping-block (shown at 17, Figs. 1, 2, and 3) is adjustably mounted and secured upon the outer end of the rod 13. This clamping-block is formed with a socket or seat 171, Fig. 2, which receives the rounded transversely-extended bar of the T-shaped head portion 181 of an operating-lever 18. The lever 18 is pivotally mounted upon a fixed stand 182, which is attached to the bed-plate 3, and it is actuated to move the said rod and punch or die in one direction to effect the punching by means of an edge cam 19, Figs. 1 and 2, on the operating-shaft 20 of the machine and to move the same in the opposite direction to retract the said rod and punch or die by means of the contracting spring 21, the latter engaging by one end thereof with the lever and by the other end thereof with the opposite stand 182.

The peep-hole-punching devices, which are located at opposite ends of the machine, comprise at each end a stand 22, Figs. 3, 9, and 10, occupying the groove 33 at such end, the said stand having cast-iron boxes 23 23 secured thereto and being provided with a fixed guide-block 24 between the said boxes and with an upright end portion 25 at the inner end of the stand. The punch-carrying rod 26 (shown separately in Figs. 7 and 8) slides in the said boxes 23 23 and is flatted at 261, Fig. 7, at its under side to fit the top surface of the said guide-block 11 to hold the rod and the punch carried thereby from turning. The rod 26 carries at its inner end the male die or punch 27 for forming an opening, peep-hole, or window in one end flange of a box-cover, the said die or punch being secured to the said end of the rod by a screw 271, as shown in Figs. 7, 8, 9, and 10. In the

retracted position of the rod 26 and die or punch 27 the said die or punch is shielded within a guard-block 28. (Shown best in Figs. 9 and 10.) The fixed internal or female die 29 is backed up by the upwardly-extending portion 25 at the inner end of stand 22 and is separated from guard-block 28 by a space of sufficient width to receive between the same and the said guard-block the end flange of a box-cover when the male die or punch 14 is retracted outwardly into the opening of the guard-block 28. For the actuation of the rod 26 and its punch or die 27 a clamping-block 30, Figs. 1, 2, and 3, is adjustably mounted and secured upon the outer end of the rod 26. This clamping-block is formed with a socket or seat which receives the rounded transversely-extended bar of the T-shaped head portion 351 of an operating-lever 35. The lever 35 is pivotally mounted upon a fixed stand 352, that is attached to the bed-plate 3, and it is operated to move rod 26 and punch or die 27 in one direction to effect the punching by means of a side cam 36 upon the shaft 20, and it is operated in the opposite direction to retract the punch by means of a spring 37, the said spring having one extremity thereof connected with one of the levers 35 and the other extremity thereof connected with the other of such levers.

In the use of the machine a box-cover is placed open side down with diagonally opposite corners thereof within the angles of the corner-guides 6 6 and with its respective side flanges entered into the respective spaces between the guard-blocks 15 15 and the dies 16 16 and its respective end flanges entered into the respective spaces between the guard-blocks 28 28 and the dies 29 29, with the free edges of the flanges resting upon the upper surface of the bed or table 3. The box-cover being thus positioned, the actuation of the male dies by means of the cams upon shaft 20 results in the formation of the thumb-holes and end openings, peep-holes, or windows, after which the box-cover is removed and a fresh one placed in position to be operated upon. The cams may be set to cause all of the four male dies to make their punching movements simultaneously, or the two thumb-hole dies 14 14 may act at one time and then the peep-hole dies 27 27.

The shapes of the different dies may vary in practice, according to the shape which is desired for the thumb-holes of the side flanges and the shape which is desired for the openings of the end flanges. The position of the said openings in the width of the box-cover may vary, as desired, according to the position which is preferred for such opening and the imprint or marking upon the box-body. Usually the imprint or marking of a given end flange of a box-body is located next one side of the latter, the imprints or markings of the two end flanges of such box-body being disposed in diagonally opposite positions with respect to each other. In the machine shown in the drawings the punching devices which act upon the end flanges are arranged to form the peep-holes, openings, or windows in this relation to each other—that is to say, they are arranged in diagonally opposite positions, as shown best in Fig. 3. In such figure the said punching devices and the corner-guides alternate in position with each other at the opposite ends of the opening 5 through the bed or plate 3.

To enable the punching devices to be adjusted to suit various sizes of box-covers, the stands 9 9 are made adjustable lengthwise toward and from each other to suit variations in the width of a box-cover, and the stands 22 22 are made adjustable toward and from each other to suit variations in the length of a box-cover. Each of the four stands is secured in working position by means of a clamping bolt or bolts, as x, Fig. 4, the stem of each of such bolts passing through a slot x^2, that is formed in the bed or plate 3, and being screwed into a threaded hole which is tapped into the under side of the stand, and a washer or plate x' being fitted to the said stem and interposed between the head of the bolt and the under side of the bed or plate. Each slot is elongated in the direction of the length of the corresponding stand, as indicated by dotted lines in Fig. 3, to provide for the adjustment of the corresponding stand toward and from the center of the machine. In addition in order to permit stands 22 22 to be adjusted transversely to suit different widths of box-covers the slots in connection with the said stands are wider transversely than the diameters of the corresponding bolts, as indicated in Fig. 4, and the grooves 33 33 similarly are wider than the stands 22 22.

Having thus described the best mode in which I have thus far contemplated carrying the invention into effect, I claim—

1. In a machine substantially such as described, in combination, corner-guides adapted to receive a flanged box member, oppositely-located punching devices to form thumb-holes in side flanges of the said box member, and oppositely-located punching devices adapted to form peep-holes or windows in end flanges of said box member.

2. In a machine substantially such as described, in combination, means to position a flanged box member, oppositely-located punching devices to form thumb-holes in side flanges of the said box member, and punching devices diagonally opposite with respect to each other and operating to form diagonally opposite openings in end flanges of the said box member.

3. In a machine substantially such as described, in combination, diagonally opposite corner-guides, opposite punching devices to

form thumb-holes in the side flanges of a box member applied to the said corner-guides, and diagonally opposite punching devices alternating with the said corner-guides and operating to form openings in diagonally opposite portions of the end flanges of such box member.

4. In a machine substantially such as described, in combination, guides adapted to receive a flanged box member, means to adjust said guides to suit different sizes of boxes, oppositely-located punching devices to act on side flanges of the said box member, stands supporting the punches and dies, means to adjust said stands to correspond with different sizes of boxes, oppositely-located punching devices to act on end flanges of the said box member, stands supporting the punches and dies, and means to adjust the said stands to correspond with different sizes of boxes.

5. In a machine substantially such as described, in combination, guides adapted to receive a flanged box member, means to adjust said guides to suit different sizes of boxes, oppositely-located punching devices to act on side flanges of the said box member, stands supporting the punches and dies, means to adjust said stands toward and from each other, oppositely-located punching devices to act on end flanges of the said box member, stands supporting the punches and dies, and means to adjust the said stands toward and from each other.

6. In a machine substantially such as described, in combination, guides adapted to receive a flanged box member, means to adjust said guides to suit different sizes of boxes, oppositely-located punching devices to act on side flanges of the said box member, stands supporting the punches and dies, means to adjust said stands toward and from each other, oppositely-located punching devices to act on end flanges of the said box member, stands supporting the punches and dies, and means to adjust the said stands toward and from each other and also transversely.

7. In a machine substantially such as described, in combination, guides adapted to receive a flanged box member, means to adjust said guides to suit different sizes of boxes, oppositely-located punching devices to act on side flanges of the said box member, stands supporting the punches and dies, means to adjust said stands toward and from each other, punching devices to act upon an end flange of the said box member, and means to adjust the said punching devices transversely of the box member.

8. In a machine substantially such as described, in combination, guides adapted to receive a flanged box member, means to adjust said guides to suit different sizes of boxes, diagonally opposite punching devices to act on side flanges of the said box member, stands supporting the punches and dies, means to adjust said stands toward and from each other, punching devices to act upon an end flange of the said box member, and means to adjust the said punching devices transversely of the box member.

9. In a machine substantially such as described, in combination, corner-guides adapted to receive a flanged box member, and diagonally opposite punching devices alternating with the said corner-guides and operating to form diagonally opposite openings in opposite flanges of the said box member.

10. In a machine substantially such as described, in combination, guides adapted to receive a flanged box member, means to adjust said guides to suit different sizes of boxes, diagonally opposite punching devices operating to form diagonally opposite openings in opposite flanges of such box member, and means to adjust the punching devices toward and from each other and also transversely.

11. In a machine substantially such as described, in combination, diagonally opposite corner-guides, opposite punching devices to form thumb-holes in the side flanges of a box member applied to the said corner-guides, diagonally opposite punching devices alternating with the said corner-guides and operating to form openings in the end flanges of such box member, and means to adjust the corner-guides and the punching devices to suit different sizes of box members.

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

CHARLES C. DAVIS.

Witnesses:
CHAS. F. RANDALL,
BERTHA F. ROWE.