

(No Model.)

7 Sheets—Sheet 1.

C. W. GAY.
PAPER BOX MACHINE.

No. 519,531.

Patented May 8, 1894.

Fig. I.

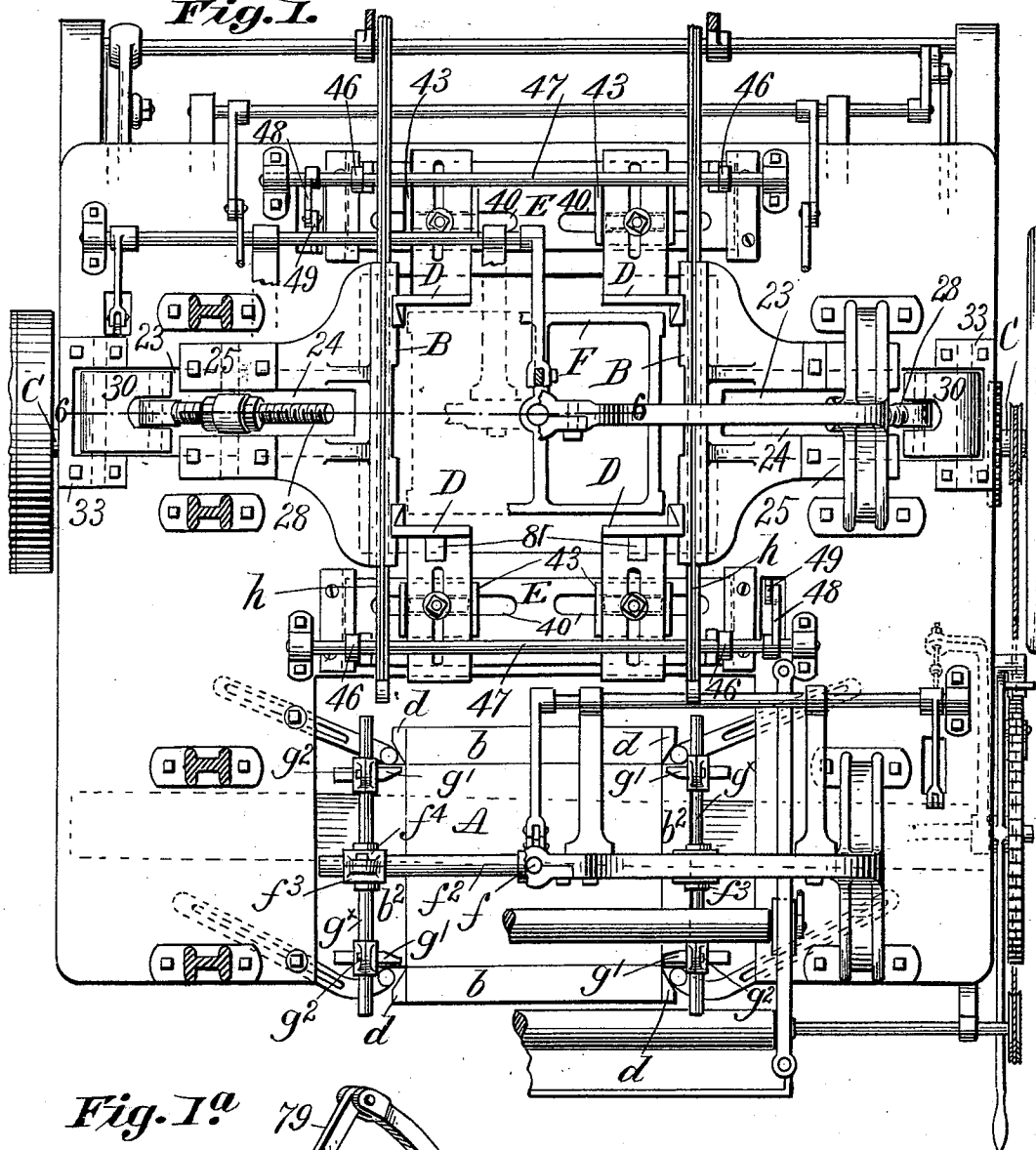
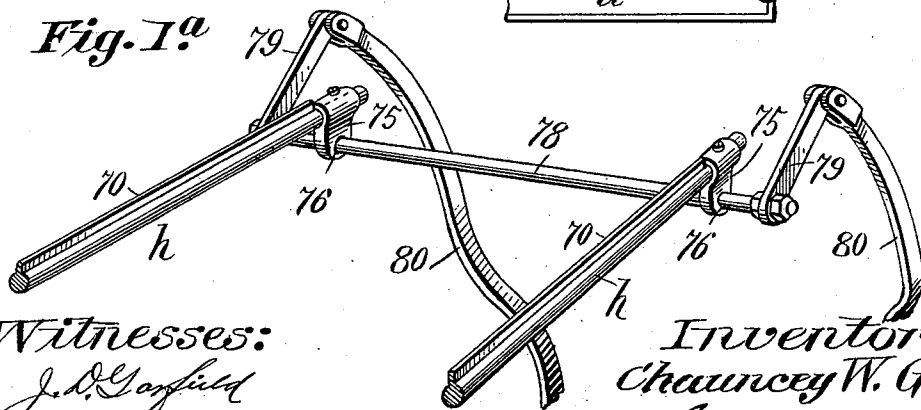


Fig. 1^a



Witnesses:
J. D. Gayfield
J. Boedeker.

Inventor:
Chauncey W. Gay.
per *Chapin & Co.*
Attorneys.

(No Model.)

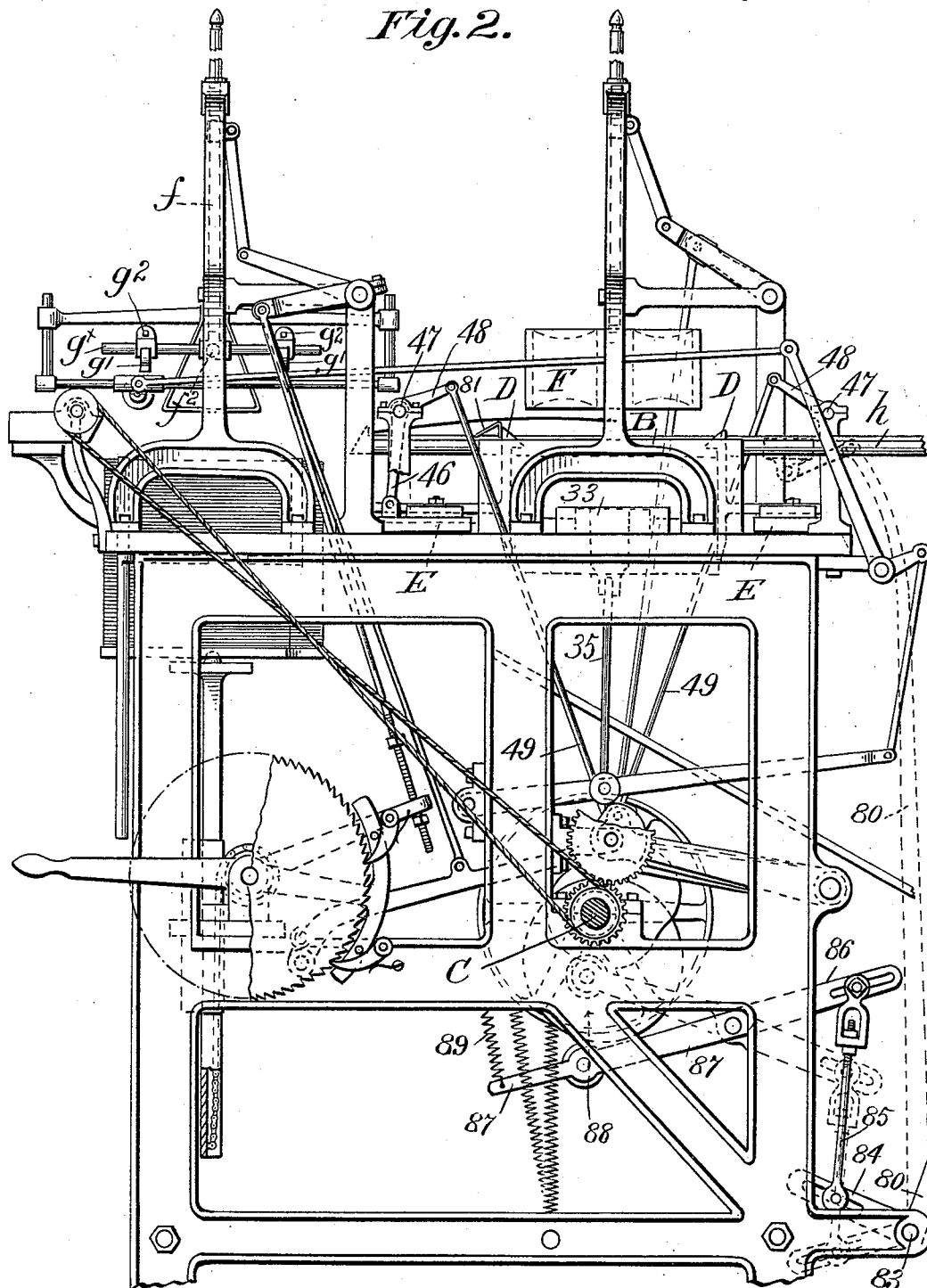
7 Sheets—Sheet 2.

C. W. GAY.
PAPER BOX MACHINE.

No. 519,531.

Patented May 8, 1894.

Fig. 2.



Witnesses:
J. B. Gay
J. Borden

Inventor,
Chauncey W. Gay,
per *Chapman*
Attorneys.

(No Model.)

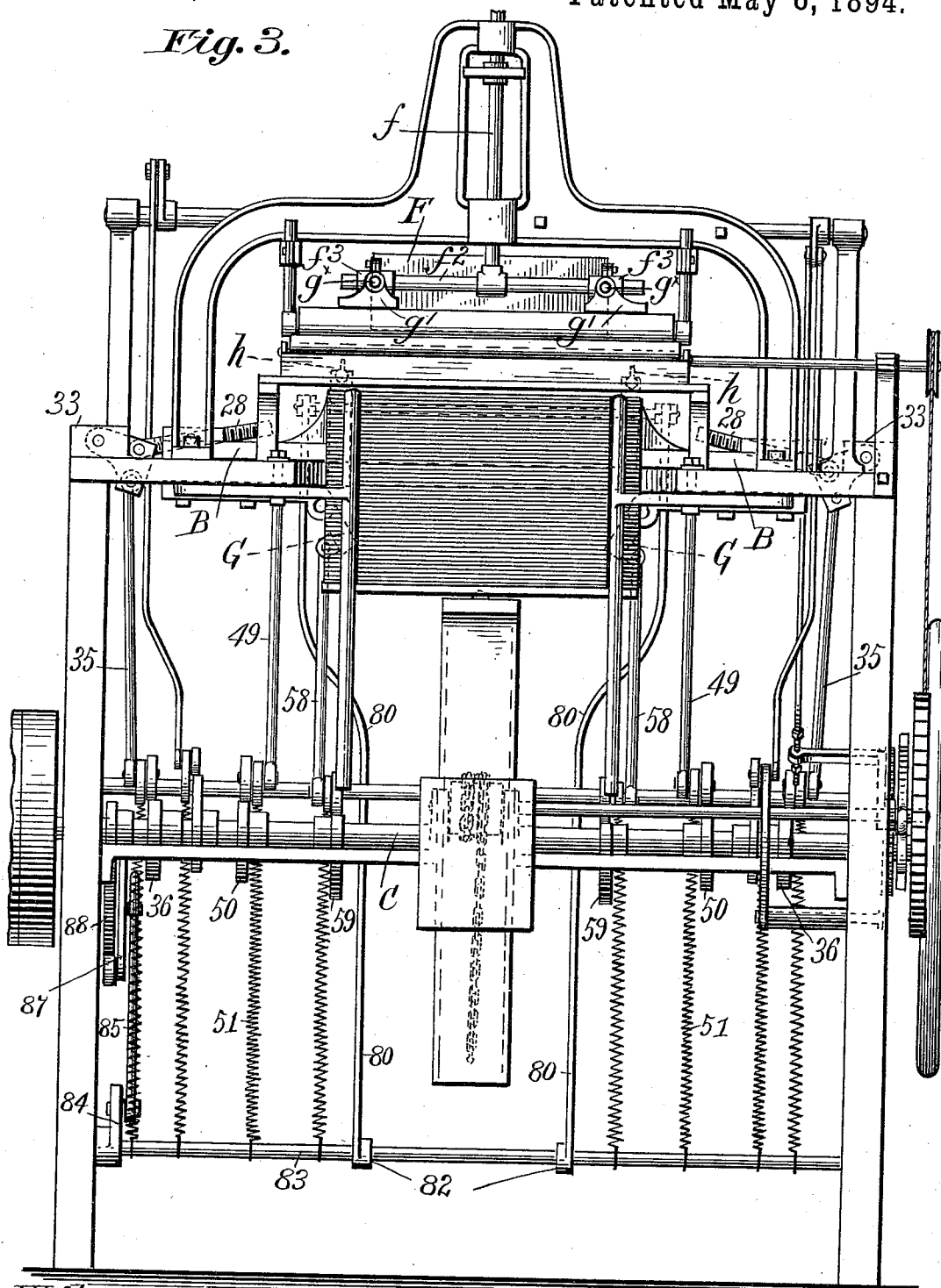
7 Sheets—Sheet 3.

C. W. GAY.
PAPER BOX MACHINE.

No. 519,531.

Patented May 8, 1894.

Fig. 3.



Witnesses:

J. W. Gay
J. Bodeker

Inventor:
Chauncey W. Gay.

per *Chapman*
Attorneys.

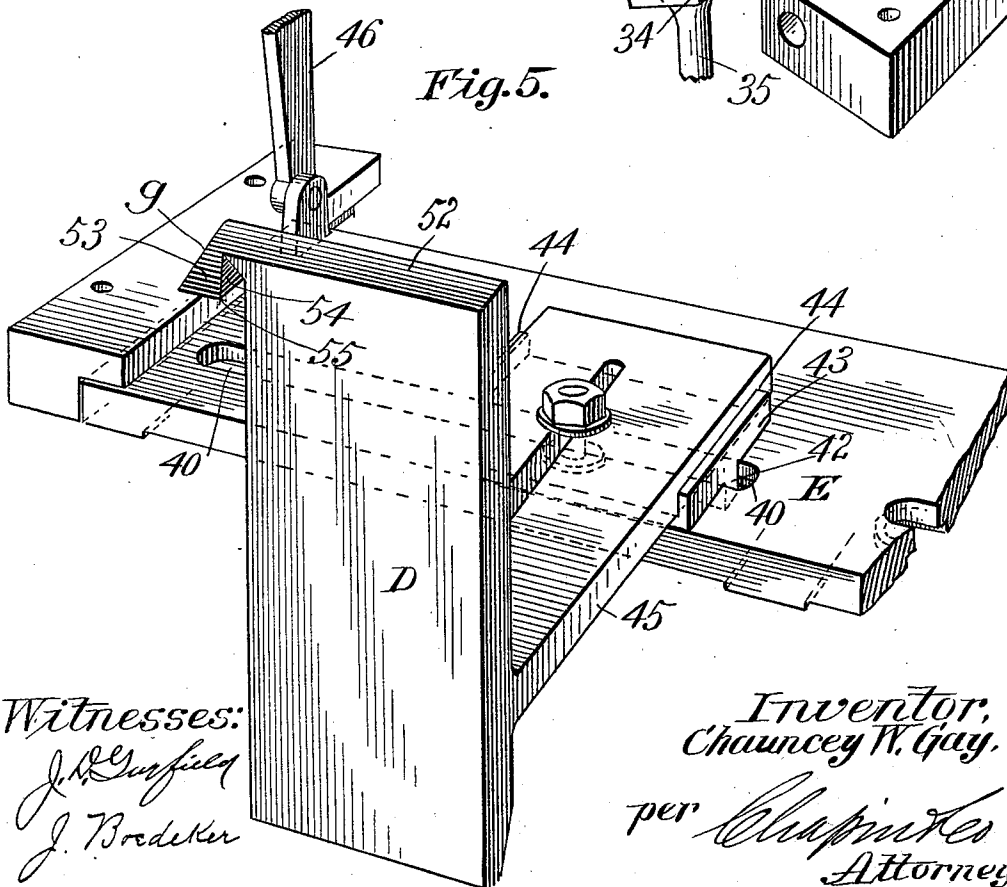
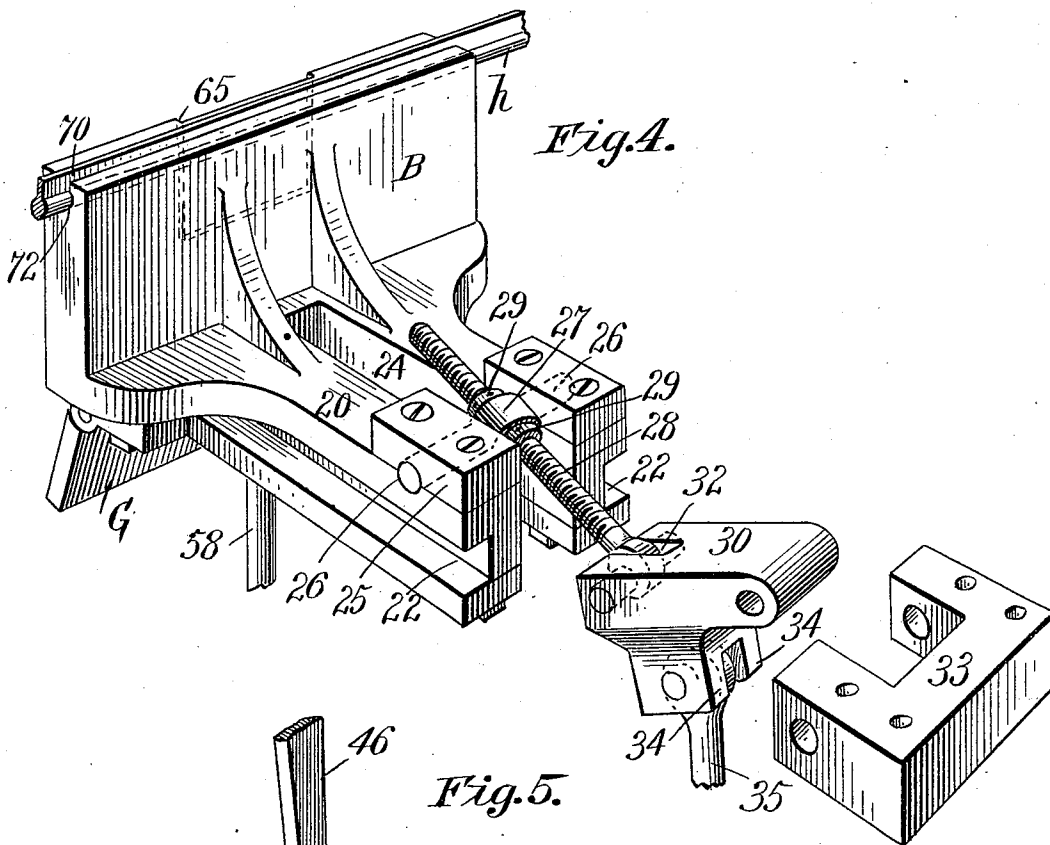
(No Model.)

7 Sheets—Sheet 4.

C. W. GAY.
PAPER BOX MACHINE.

No. 519,531.

Patented May 8, 1894.



Witnesses:
J. R. Surfield
J. Brodker

Inventor,
Chauncey W. Gay.
per *Chapman*
Attorneys.

C. W. GAY.
PAPER BOX MACHINE.

No. 519,531.

Patented May 8, 1894.

Fig. 6.

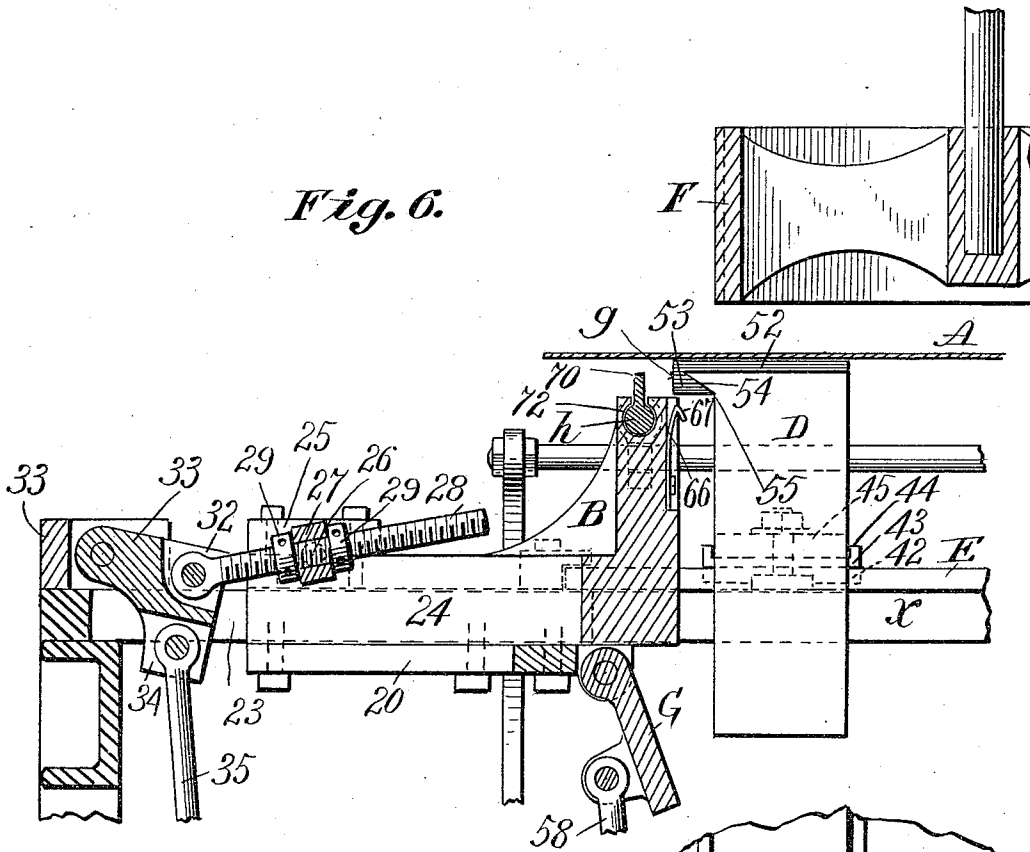
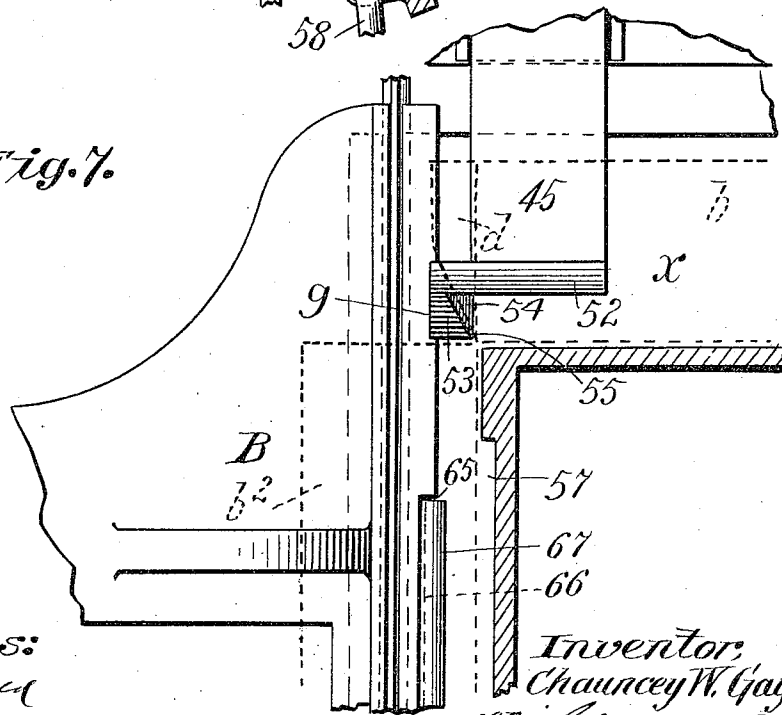


Fig. 7.



Witnesses:

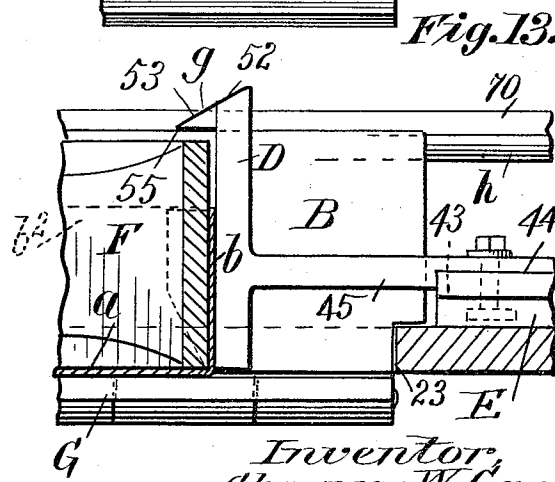
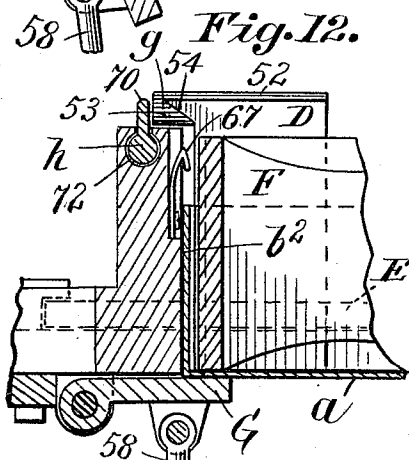
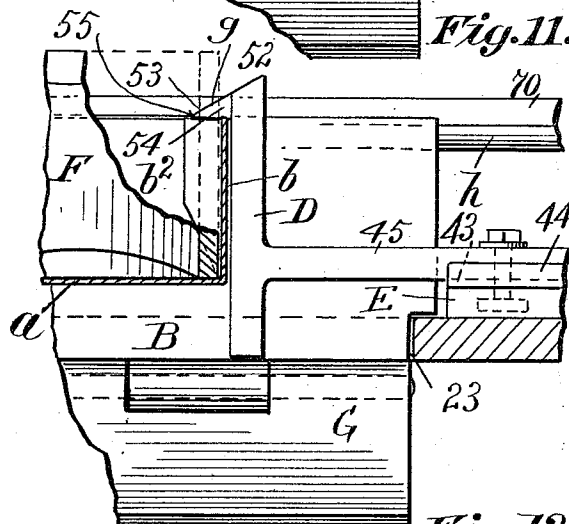
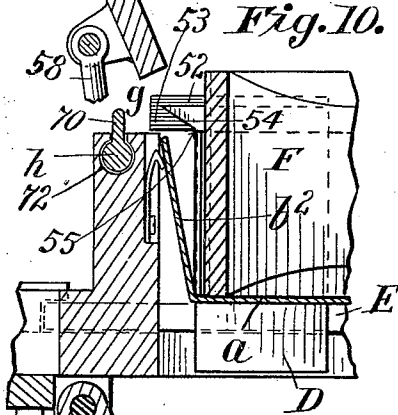
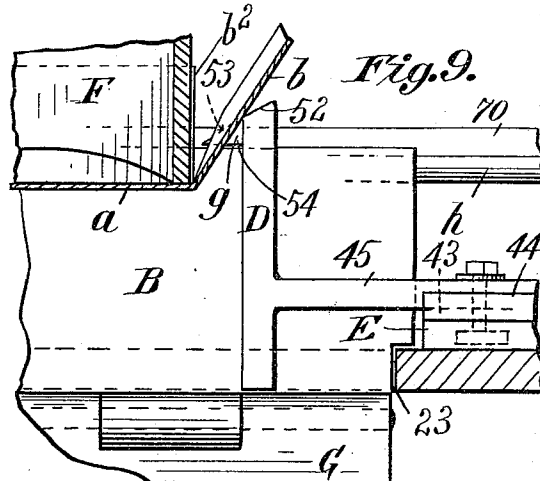
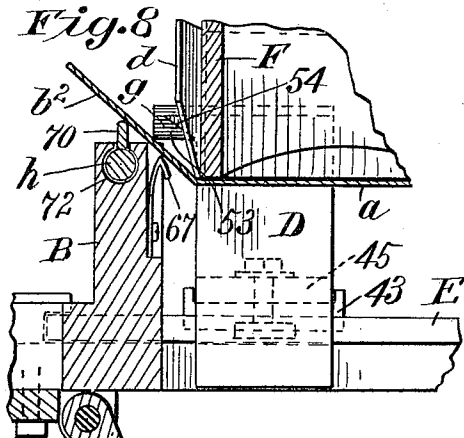
J. H. Gaffney
J. B. Brediker

Inventor:
Chauncey W. Gay
per *Chapman & Co.*
Attorneys

C. W. GAY.
PAPER BOX MACHINE.

No. 519,531.

Patented May 8, 1894.



Witnesses:
J. D. Garfield
J. B. Decker

Inventor,
Chauncey W. Gay
per *Chapman & Co*
Attorneys.

(No Model.)

7 Sheets—Sheet 7.

C. W. GAY.
PAPER BOX MACHINE.

No. 519,531.

Patented May 8, 1894.

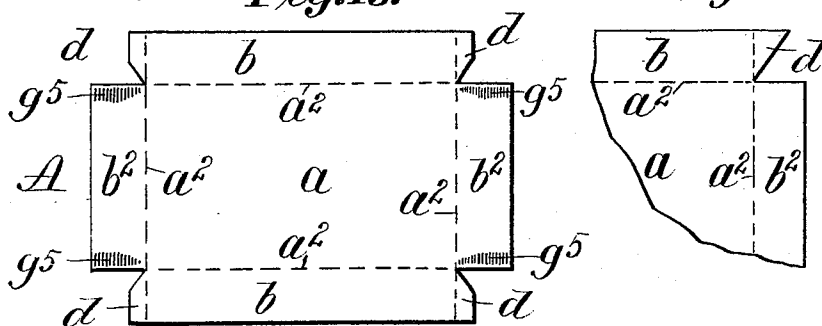
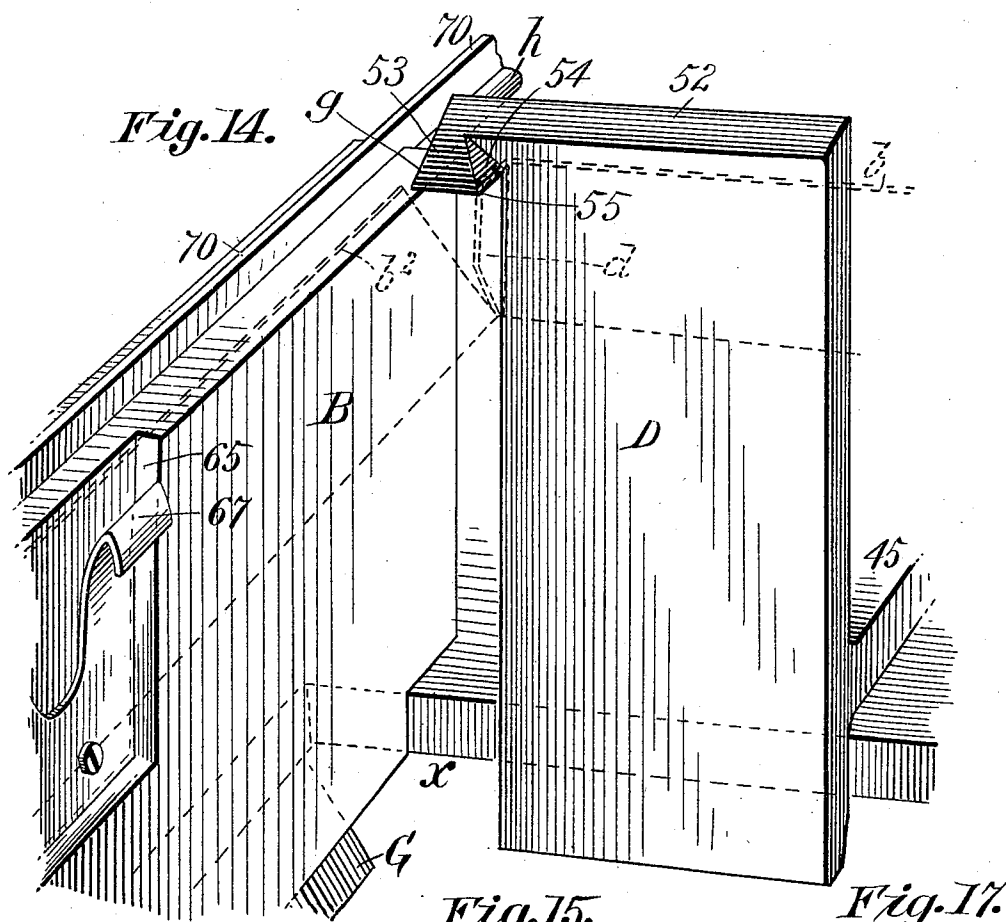
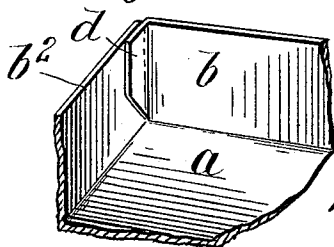


Fig. 16.



Witnesses:

J. R. Gayfield
J. Bordeker

Inventor
Chauncey W. Gay.

per *Chapin & Co.*
Attorneys.

UNITED STATES PATENT OFFICE.

CHAUNCEY W. GAY, OF SPRINGFIELD, ASSIGNOR OF ONE-HALF TO I. W. BROWN & CO., OF BRIGHTWOOD, MASSACHUSETTS.

PAPER-BOX MACHINE.

SPECIFICATION forming part of Letters Patent No. 519,531, dated May 8, 1894.

Application filed October 13, 1893. Serial No. 488,190. (No model.)

To all whom it may concern:

Be it known that I, CHAUNCEY W. GAY, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Paper-Box Machines, of which the following is a specification.

This invention relates to improved mechanisms embodied in an automatic machine for gumming paper box blanks and for folding them and insuring the adhesion of the adjacent corner flaps or wings.

The improvements more particularly relate to the gumming and picker mechanism, the blank conveyer, the folding and setting mechanisms, as to their constructions and the combination or arrangement of certain thereof to each other, and, incidentally in connection with these mechanisms, the invention relates to subordinate features for utility and novelty, as will be hereinafter rendered manifest.

The invention also has reference to constructions and arrangements whereby the machine may be utilized for making boxes of different shapes and sizes; and the invention consists in various constructions and combinations of parts, all substantially as will hereinafter fully appear and be set forth in the claims.

Reference is to be had to the accompanying drawings, in which the invention is fully illustrated, wherein—

Figure 1 is a plan view of the box making machine. Fig. 1^a is a perspective view of certain of the driving connections for the blank conveyer. Fig. 2 is a side elevation of the machine, and Fig. 3 is a front elevation of the same. Fig. 4 is an illustration in perspective of one of the end setting followers. Fig. 5 is a perspective view showing one of the corner wing folders and the piece to which it is connected. Fig. 6 is a vertical section on a large scale taken through a part of the folding and end setting mechanism about on the line 6—6, Fig. 1. Fig. 7 is a plan view of parts seen in Fig. 6, the folding plunger being shown in horizontal section. Figs. 8, 10, and 12 are vertical sections taken substantially on the plane indicated by the line 6—6, Fig. 1, (and somewhat similar to Fig. 6) showing different stages

of the folding operation, while Figs. 9, 11, and 13, are sectional elevations of the same. Fig. 14 is a perspective view on a large scale showing the formation and arrangement of the parts at the corner of the folding throat or box. Fig. 15 is a plan view of the blank from which the box is produced. Fig. 16 is a perspective view showing the relative disposition of the parts of the blank at the corner of the completed box. Fig. 17 is a plan view showing a slight modification which may be practicably made in the form of the blank at the stay section.

Similar characters of reference indicate corresponding parts in all of the views.

A,—Fig. 15, and also Fig. 1,—represents the blank from which the box is formed, the same comprising a rectangular middle section, *a*, as bounded by the scores or bending lines, *a*², outside of which are the side sections, *b*, *b*, and end sections, *b*², *b*², the lengths of which are equal to the proximate boundaries of the middle section, the widths being equal to the height of the box (or box cover). The blank also comprises the stay sections, *d*, which are formed as endwise continuations of the opposite side sections, there being between them and the said side sections the scores or bending lines, *a*³. These stay sections are of trapezoidal form, as rendered by the diagonal cut at *d*². These sections might, however, be triangular, as indicated in Fig. 17.

In making the box the side and end sections are bent up at right angles to the bottom, the wings or stay sections are turned at right angles to the side sections from which they are unsevered and lie against the inner sides, near their ends, of the end sections, being stuck thereto by the gum, or usual adhesive, no separate stay strips of tape or other flexible material being necessary.

In the manufacture of the boxes substantially as described, the blanks are placed in a pile upon an elevator and automatically raised so as to present the top of the pile subject to the impact in its descent of the gummer-pickers; the pickers lift the blanks, one at a time, and while the blank is lifted the blank-conveyer comes horizontally forward thereunder, whereupon the blank is detached from the picker and falling upon the conveyer

is, by the latter, carried over the folding box, or throat, and under the folding plunger, all very much in the manner of handling blanks for envelopes. The walls of the rectangular throat or folding box stand normally opened from each other leaving the opening larger than the plan of the box, said walls being inwardly movable, and have movements imparted periodically to them, whereby the in-
 10 folded wings are properly brought to the squared form and have their ends squeezed hard against the plunger to set the gummed stay-sections. The folded and stuck boxes are then permitted to fall down through the
 15 opening at the bottom of the folding box to be cared for in any suitable manner.

The gummer picker, as seen in Figs. 1, 2 and 3, comprises the vertical reciprocatory shaft, *f*, the motion to which is imparted in
 20 the manner usual in envelope machines, and this shaft has secured to its lower end the horizontal, transversely ranging bar, or rigid rod, *f*². This rod has, adjustably fitted at each end, the split collars, *f*³, held by grip
 25 nuts, *f*⁴, in and through both of which collars are secured, by their middles parallel, and forwardly and rearwardly ranging rods, *g*^x, *g*^x; on the end portions of these rods are adjust-
 30 ably fitted and held by the set screws, *g*², the split hubs, *g*³, of the pickers, *g*¹; the picker members, proper, standing in parallel front and rear pairs, or at the corners of an imagi-
 35 nary rectangle coinciding with the ends of the end sections of the blank, and all as plainly seen in Fig. 1. The gumming im-
 40 pressions of the pickers are also seen at *g*⁵, in Fig. 15. By properly adjusting the bars, *g*^x, along the bar, *f*², the pickers may be arranged for gumming the blank for a box of different
 45 length;—and with the pickers set for any given length, by adjusting them individually fore and aft on the bars, *g*^x, *g*^x, they may be made to accord with the blanks which are provided for boxes of a differing width.

The folding box, or throat, the sides of which are movable, are constituted by the end followers, B, B, and the vertical plates or
 50 blocks, D, D, D, D, front and rear pairs of which are mounted on the slides, E, E. These parts have, at proper times and when the folding plunger, E, is well down, their closing-in movements, as will be hereinafter
 55 set forth, but they stand, when the plunger is up, at the boundaries of a rectangle somewhat larger than the plan of the completed box, and at, or near, the boundaries of the rectangular opening, *x*, at the opposite ends of which are the hinged bottom sections, deriving their swinging movements in the man-
 60 ner hereinafter described.

The end followers, and their actuating means, are fully and clearly shown in Figs. 1 to 4, and 6 to 7; and each of these duplicated mechanisms comprises a bottom slide, 20, con-
 65 strained, for slight extents of horizontal rectilinear reciprocatory movements, by the grooved formations seen at 22, which insure

support and guide engagements with the boundaries of the apertures, 23, transversely
 70 formed in the table, as continuations of the throat-opening, *x*. And the slide has, at its inner end, the right angular and upright member constituting the follower proper, B, the height of which is to be approximately
 75 that of the box to be formed in the machine. The follower-slide is centrally and longitudinally apertured outside of the upright member, as seen at 24, and has at its top rear end the sub-
 80 stantial bearings, 25, 25, for the trunnion-like journals, 26, 26, of the collar, 27, which has its location within the said aperture. Through this collar is the shank of the screw-shaft, 28, the engagement being adjustably insured by
 85 the two lock-nuts, 29, 29. This screw-shaft forms one member of a toggle-joint, the other member thereof consisting in the link-piece, 30, which has the bifurcated formation at 32,
 90 receiving pivotal connection thereof of the said screw-shaft, and which toggle member has its opposite end pivotally mounted in the apertured support block, 33, firmly bolted to the table near its lateral edge. The said toggle
 95 member, 30, has the depending ear-pieces, 34, 34, within and pivotally connected to which is the upper end of the thrust-rod, 35, which is operated through means of the cam, 36, on the main shaft, C. The slides, E, E, which
 100 are at the front and rear of the said opening, *x*, have their reciprocatory movements on the top of the bed toward and from the front and rear edges of the said opening, and at right
 105 angles to the line of movement of the followers, B, B. The slides have the slots, 40, longitudinally thereof (which slots are transversely of the table of the machine) in which
 110 are set the depending ribs, 42, of the clamp blocks, 43, which are provided with the upwardly extended edge flanges, 44, 44. The aforementioned vertical blocks, or plates, D, D, have their horizontal right angular mem-
 115 bers, 45, fitted in the clamp blocks, these members, the blocks, and slide, all being confined by the bolts, the shanks of which pass down through the parts, 45 and 43, and the
 120 slotted slide, the nut locking them in the confinement when adjusted. It will be seen that the vertical plates, D, D, have their location within the opposite edges of the aperture, *x*, their upper edges being,—as will be seen in
 125 Figs. 6 to 14,—somewhat higher than the upper edges of the followers. The properly timed and periodically reciprocatory movements are imparted to the slides, E, E, by the connection therewith of arms, 46, extended
 130 from the rock-shaft, 47, 47, each rock-shaft having a radial arm, 48, with which is connected the upper end of a thrust-rod, 49, which receives its reciprocatory movement in one direction by the main-shaft cam, 50, and in the other by the spring, 51. The plates, D, D, of the front and rear pairs stand in
 135 coinciding planes which are within the ends of the followers, B, the outer edges of the plates being quite near the working faces of

the followers even when the latter are retreated. These plates, D, are, therefore, as manifest, adjustable edgewise toward or from each other, that is, along the lengths of the slides, E,—and also are adjustable inwardly, transversely of the slides, to accord with different-sized box blanks, the adjustment of the followers, at their connections with the screw-toggle members, being necessary to accord with the edgewise adjustment of the plates, D, for changes of length. Were it not for the purposes of adjustment of these plates, D, as above explained, a single wider plate of the required formation might be provided non-adjustably as to its width at, and upon, the front and rear slides. Each plate, D, stands a little higher than the top of the follower, its upper edge being upwardly and outwardly beveled, as seen at 52, and each plate has at its upper corner toward the follower, a projection, *g*, which as regarded relatively to the dimensions of the plate D extends longitudinally outwardly from the edge, and also laterally inwardly from the face of the plate, D. The upper surface, 53, of this projection is on a bevel corresponding to, and as a continuation of, the bevel, 52, of the upper edge of the plate, while its inner face, 54, which is opposite from the working face of the follower, is downwardly and inwardly beveled, toward the plane of movement of the vertical end of the plunger, see Figs. 1, 5, and 6. When the follower is forced up to edgewise contact with the plates, D D, its upper surface is closely under the aforesaid projections, *g*, *g*. The conveyer, to be soon described in detail, brings the flat blank from the pile, at the front, to a position over the throat, the side sections, *b*, *b*, overlying the upper edges of the plates, D D, the stay sections in part overlying the projections, *g*, while the end sections overlie the tops of the followers. The relations of these parts are shown in Figs. 6 and 7, the heavy broken lines in the latter figure indicating the blank, the parts, D and B, being shown as retreated. Now, before the said retreated parts move to their contracted relations, the folding plunger descends and as the middle of the blank is, by the plunger, forced down, the opposite side sections, *b*, are bent angularly to the bottom section, *a*, and the stay sections, *d*, are, by the beveled faces, 54, of the projections, *g*, caused to assume, more or less nearly, right angular relations to the side flaps, as well as to the bottom, all as will be clearly understood on reference to Figs. 8 to 16 of the drawings, in connection with this description. It will be perceived, Figs. 10 and 11, that as the plunger descends so far as to cause, in its cooperation with the faces 52, 54, the sections, *b*, *d*, to have their top edges nearly vertical and about coincident with the under surfaces of the projections, *g*, and the end sections, *b*², to stand angularly to the bottom section, *a*, the slides, E, are moved inwardly causing the plates, D, D, and the edge or corner, 55, of

the projection to have positions snugly up to the sides of the plunger, the said blank sections, *b*, *d*, of course assuming positions next to the plunger; and now each of the followers begins to move inwardly, finally assuming the position seen in Figs. 12 and 13. As the followers come up and remain hard against the blank sections, *b*², *d*, insuring the setting of the adhesive, and at a time when the bottom of the plunger is level with the bottom of the followers, the hinged bottom sections, G, G, are forcibly swung up against the bottom end portions of the box, and, together with the followers, effect the positive shaping and setting of the box.

It will be perceived in the drawings that the end of the plunger is reduced or rabbeted, as at 57, at its ends between its corners, so that the entire end pressure by the followers against the ends of the plunger is next to the corners, where only is such pressure necessary. The bottom sections, G, G, are in the form of plain rigid rectangular bars, and are hinged near the lower corners, at their working ends, of the follower slides, as fully and clearly shown in the drawings. Each said hinged section has connected thereto the thrust-rod, 58, operated by the properly timed and guided cam on the cam-shaft.

Each of the vertical members, B, of the followers has, within its working face, a recess, 65, in which is set a plate, 66, having its upper portion overturned to form a hook, 67, which stands outwardly beyond the face of the follower, at a place opposite the rabbeted part, 57, of the plunger. As the plunger, after having forced the blank down against the bottom sections, G, retreats rapidly upward before the followers have retreated much, should the box hang upon the plunger it will, by the said hooked clearing device, be stripped therefrom and will, of course, fall down through the throat opening as the members constituting it expand or recede.

The blank conveyer comprises the parallel opposing horizontal bars, *h*, *h*, each of which has the longitudinal upwardly extended rib, or feather, 70.

The follower members, B, B, have endwise through them, which is fore and aft of the machine near their upper, inner corners, the ways, 72, for the said feathered conveyer-bars, said ways having the contracted openings leading to the upper surface of the follower members so that the feathers 70, stand with their edges considerably above the said upper surfaces. While the conveyer-bars move longitudinally thereof through the conveyers for the purpose of receiving thereupon the blanks and carrying them to their positions over the folding box, they necessarily have, by reason of their support upon the followers, movements transversely of their lengths bodily with the followers; and to permit this action each of the bars has, at or near its rear end the angularly extended perforated lug, 75, while through the perforation, 76, of these

lugs is loosely passed the horizontal bar or rod, 78, to which the cam-operated driving connections are secured; the last mentioned driving connections are indicated in Figs. 1^a and 2 and consist of the links, 79, pivotally connected to the ends of the bar and the upright swinging levers, 80, 80, which have their upper ends connected to said links, their lower ends being rigidly supported, as at 82, to suitable parts of the rock-shaft, 83, which is mounted in suitable bearings therefor of the framing. This rock-shaft has the radial arm or crank, 84, which, by a link, 85, is connected to one arm, 86, of an intermediately pivoted lever, the other arm, 87, of which has the roller stud in working engagement with the eccentric or cam, 88. The spring, 89, insures the movement of the last described parts in a direction opposite to that in which the said parts are positively forced by the cam.

The rib or feather 70, which stands above the top of the follower, B, constitutes, in a certain degree, the former member, or part, coacting in the upward and inward turning of the end sections, b^2 , as will be apparent on an inspection of Fig. 8; the upper part of the follower, B, might be downwardly and inwardly beveled whereby the adequate folding action would be derived, but by the construction shown, wherein the feather stands above the longitudinal way, 72, at its upper orifice, there will be no liability of the lubricant, which is liberally provided in the slide-way, coming onto the surface of the blank.

Inasmuch as the upper edges of the plates, D, are higher than the tops of the followers, B, and the plane of movement of the conveyer bars, h , the front pair of the plates have the sheet metal upwardly and rearwardly inclined deflectors, 81, to raise and guide the rear edge of the rearwardly moving blank as it assumes its position over the folding throat.

The elevating mechanism for the blanks and the means for supplying the pickers with gum are not herein particularly described as they constitute no part of the novelties of this invention and may be substantially as usual and well known in envelope machines.

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

1. In a machine of the character described, the combination with the vertical reciprocatory picker-shaft having fixed at its lower end the horizontal bar, f^2 , the bars, g^x , g^x , adjustably secured upon, and at right angles to, the end portions of the said bar, f^2 , and having the pickers individually supported upon and detachably connected for longitudinal adjustment along the end portions of said bars, g^x , g^x , substantially as and for the purpose set forth.

2. In a machine of the character described, the combination with the vertical reciprocatory shaft having fixed at its lower end, by its middle the horizontal transverse bar, f^2 , with the adjustably confined collars, f^3 , at its

ends, the horizontal bars, g^x , g^x , ranging in parallelism fore-and-aft and secured in socket-lugs of said adjustable collars, and the individual pickers having split socket-lugs and set screws whereby they have adjustable engagements along the end portions of said bars, g^x , g^x , substantially as and for the purposes set forth.

3. In a paper-box machine, the combination with the table having the aperture and reciprocatory folding plunger, movable relative thereto, of the slide-followers which constitute opposite sides of the throat or folding-box and the bottom sections hinged to the working ends of the follower-slides and means for imparting reciprocatory movements to the follower-slides, and swinging movements to the hinged bottom sections, while the followers are in their approached relations, substantially as described.

4. In a paper-box machine, the combination with the table having the aperture and the plunger vertically movable relatively thereto, of the followers each comprising the horizontal slide base with the aperture, 24, and a vertical inner end member, B, the collar, 27, supported within said aperture and having lateral journals in bearings at the top of the slide at each side of the said aperture, the link member, 30, pivotally secured upon the table, the screw-shaft, 28, pivotally connected to the link member and having its shank extended through said collar, with the lock-nuts thereon at each side of the collar, the cam, and the thrust-rod actuated thereby which has a connection with one of the said link members, substantially as described and for the purposes set forth.

5. In a paper box machine, the combination with the movably supported followers with slide-ways, of the blank conveyer having the side bars thereof longitudinally movable through said ways of the followers, and also bodily movable transversely of their length in unison with said followers, and means for imparting the approaching and retreating movements to the followers, and for moving the conveyer bars longitudinally, substantially as and for the purpose set forth.

6. In a paper-box machine, the combination with the movably supported followers with ways, of the blank-conveyer comprising the parallel side bars longitudinally movable through said ways of the follower and bodily movable transversely of their length in unison with said followers, and having at their rear ends the angularly extended perforated lugs, 75, 75, the bar, 78, extended transversely of said bars loosely through the said perforated lugs, and driving connections for imparting to said bar a forward and rearward reciprocatory movement, substantially as described.

7. In a paper-box machine, the combination with the reciprocatory plunger, and the throat or folding-box consisting of opposing sets of vertical plates, or members, which are movable toward and from each other, and means

for imparting said movements thereto, of a clearer or stripper set within a recess which is formed within the face of one of said vertical plates and which has, by a hooked portion thereof, a position of extension outwardly beyond the plane of the face of said member, substantially as described.

8. In a paper-box machine, the combination with the plunger and the throat or folding-box constituted by the plates, D, D, and the follower members, B, B, of the slides on which said members are mounted and means for imparting to the respective sets thereof reciprocatory movements at right angles to each other, and the hinged bottom sections, G, G, secured to the lower inner edges of the follower-slides and means for swinging them into their horizontal positions when the followers are in their approached relations to the plunger, substantially as described.

9. In a paper-box machine, the combination with the plunger and the folding-box or throat, the walls of which are constituted by upright members of opposing end followers, and the upright opposing plates, D, D, at right angles to the followers, and which have projections at the tops of their vertical edges adjacent the followers, the upper edges of the followers and plates constituting edges by and upon which are bent, as the plunger descends, the end and side sections of the box blank while the integral stay sections are, by said corner projections, turned in at right angles to the side sections, substantially as described.

10. In a paper box machine, the combination with the plunger, of a folding-box or throat having one or both of its opposite sides constituted by one or more upright plates, D, each with an edgewise longitudinal projection, *g*, at an upper corner thereof which is also laterally extended relative to the inner face of the plate and having with the plate proper the common upward and outward bevel, 52, 53, and said projection having the inner surface, 54, which is in a plane perpendicular to the face of the plate downwardly and inwardly inclining toward the plane of movement of the vertical end of the plunger, substantially as described.

11. In a paper box machine, the combination with the plunger and the follower slides, 20, and the slides, E, E, and means for imparting slight reciprocatory movements thereto, of a folding-box or throat constituted by the opposing upright members, B, B, of the end followers, and the upright plates, D, D, of the slides, the said plates having a height greater than that of the members, B, and having their upper edges beveled, and with the projections, *g*, at the corners near and above the followers which have the beveled surfaces, 53 and 54, all substantially as and for the purpose set forth.

12. In a paper-box machine, the combination with a reciprocating folding-plunger, and the followers, B, B, movable toward and from the ends thereof, and adjustable for insuring

at pleasure variations as to their normal relative dispositions of the slides at opposite sides of the plunger and having the upright plates, D, D, which are adjustable along the lengths of the slides, substantially as and for the purpose set forth.

13. In a paper-box machine, the combination with a reciprocating folding-plunger and the followers, B, B, movable toward and from the ends thereof and adjustable for insuring at pleasure variations as to their normal relative dispositions, of the slides at opposite sides of the plunger having the upright plates, D, D, which are adjustable on the slides in the direction of the movement thereof, and which are also adjustable along the lengths of the slides at right angles to the slide movement, all substantially as and for the purposes set forth.

14. In a paper-box machine, the combination with the reciprocating folding plunger and the end followers, of the slides E, E, each longitudinally slotted, and having the clamp-block, 43, with the rib, 42, and the edge flanges, 44, and the vertical plates, D, D, with the beveled upper edges, the upper edgewise corner projections, *g*, and having the foot members, 45, which are slotted at right angles to the slot of the slide, the locking bolt for rigidly clamping the slide, clamp-block, and foot-member, and means for imparting a fore-and-aft movement to the slide, substantially as described.

15. In a paper box machine, the combination with the end followers, of the side plates, D, and the slides, E, in which they are mounted, the cams, the rock-shafts, 47, having arms, 46, connected to the slides and having the arms, 48, and the thrust-rods, 49, in operative relation to said cams and connected to said arms, 48, substantially as described.

16. In a paper-box machine, the combination with the folding plunger and the end followers and conveyer having its movement at about the level of the top of the end followers and the front and rear plates, D, D, constituting the side folders, the upper edges of which are higher than the conveyer, and the front plates, D, having the deflectors, 81, substantially as described.

17. In a paper-box machine, the combination with the followers, B, B, having the ways in their upper portions, of the blank conveyer comprising the bars, *h*, *h*, with the upwardly extended ribs or feathers, 70, movable through the said ways, the upper edges of the feathers standing above the tops of the followers, substantially as and for the purpose set forth.

18. In a paper-box machine, the combination with the followers, of the conveyer bars, *h*, movable in the ways of the follower and transversely bodily movable with the follower, and the bar, 78, having the sliding connection, substantially as described, with the conveyer, of the levers, 80, and the rock-shaft, 83, on which they are mounted, the

links, 79, connecting the upper ends of said levers to said bar, 78, the cam, 88, and the intermediately pivoted lever, 87, one arm of which is in operative relation to the cam, and
5 an arm on the rock-shaft having a connection with the other arm of the lever, substantially as described.

19. In a paper-box machine, the combination with a reciprocatory plunger, of a throat
10 consisting of opposing upright plates with the projections, *g*, for folding the side and stay sections and the end followers at right angles to the plates which, together with the said plates, are mounted for reciprocatory
15 movements, the said followers and plate being adjustable in directions of their movement whereby they may, at pleasure, be caused to have, normally, relations to consti-

tute different sized folding throats, substantially as described. 20

20. In a paper-box machine, the combination with the parallel upright front and rear plates, *D*, *D*, with the projection, *g*, extended longitudinally edgewise and also laterally inward at the upper outer corners of the plates, 25 of the end followers at right angles to the said plates and having their working faces of greater extent than the distance between the plates, *D*, *D*, and having their tops slightly lower than the under sides of the said projec- 30 tions, *g*, substantially as shown and described.

CHAUNCEY W. GAY.

Witnesses:

WM. S. BELLOWS,

H. A. CHAPIN.