

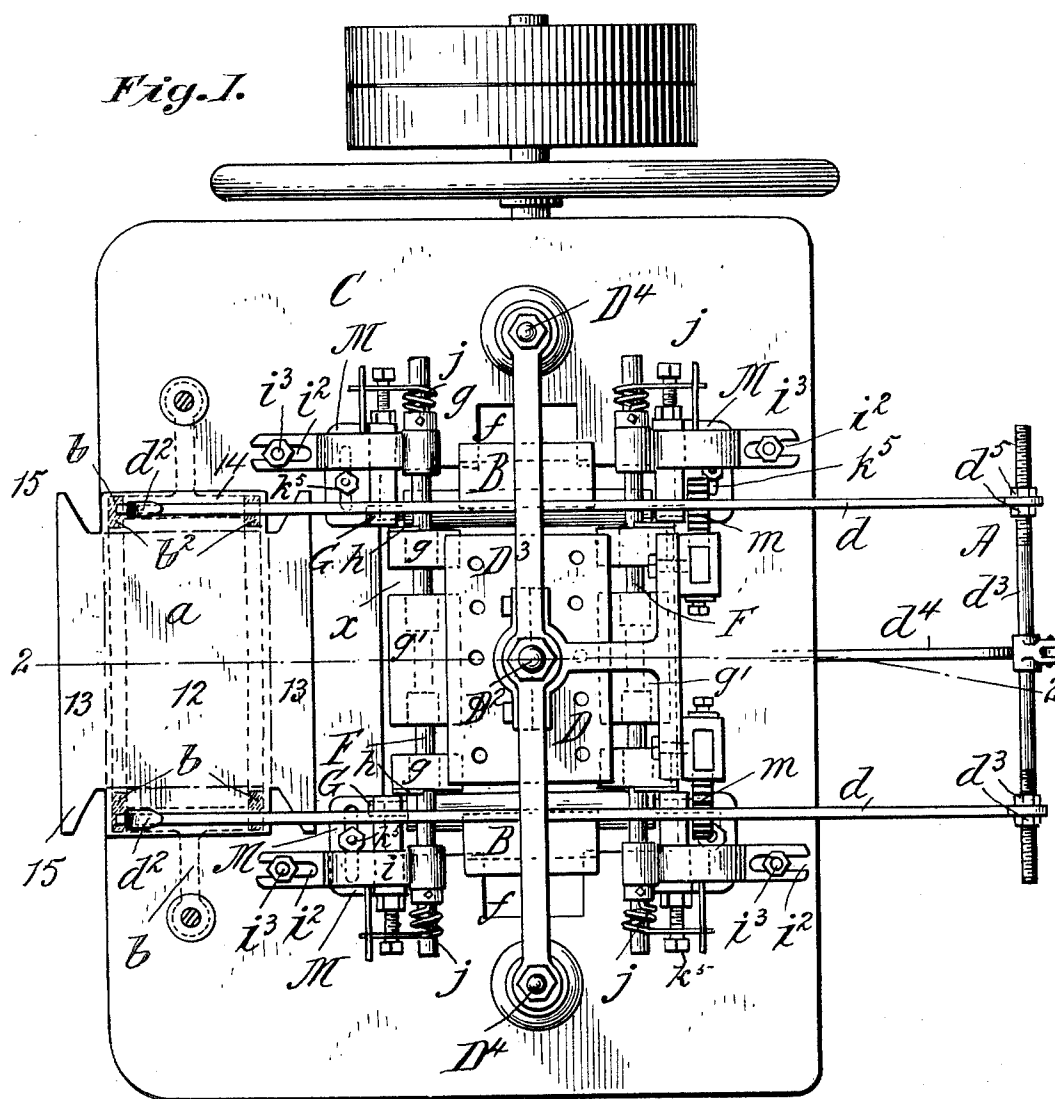
(No Model.)

4 Sheets—Sheet 1.

C. F. TAYLOR.
PAPER BOX MACHINE.

No. 586,803.

Patented July 20, 1897.



Witnesses:

J. G. Hub.
G. G. Secker

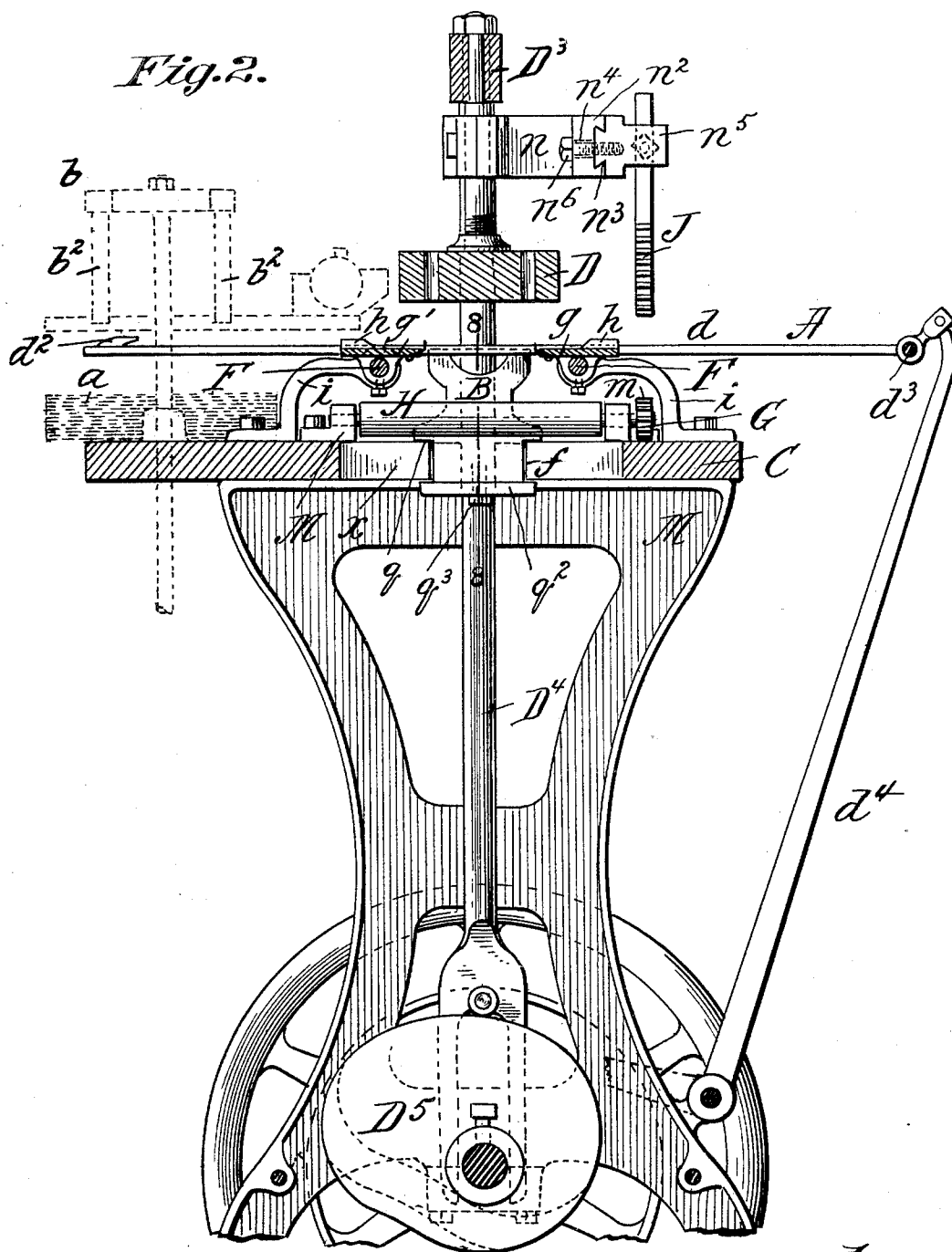
Inventor

Chas. F. Taylor,
by Messrs. Ballou, Attys.

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PAPER BOX MACHINE.

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Patented July 20, 1897.



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(No Model.)

4 Sheets—Sheet 3.

C. F. TAYLOR.
PAPER BOX MACHINE.

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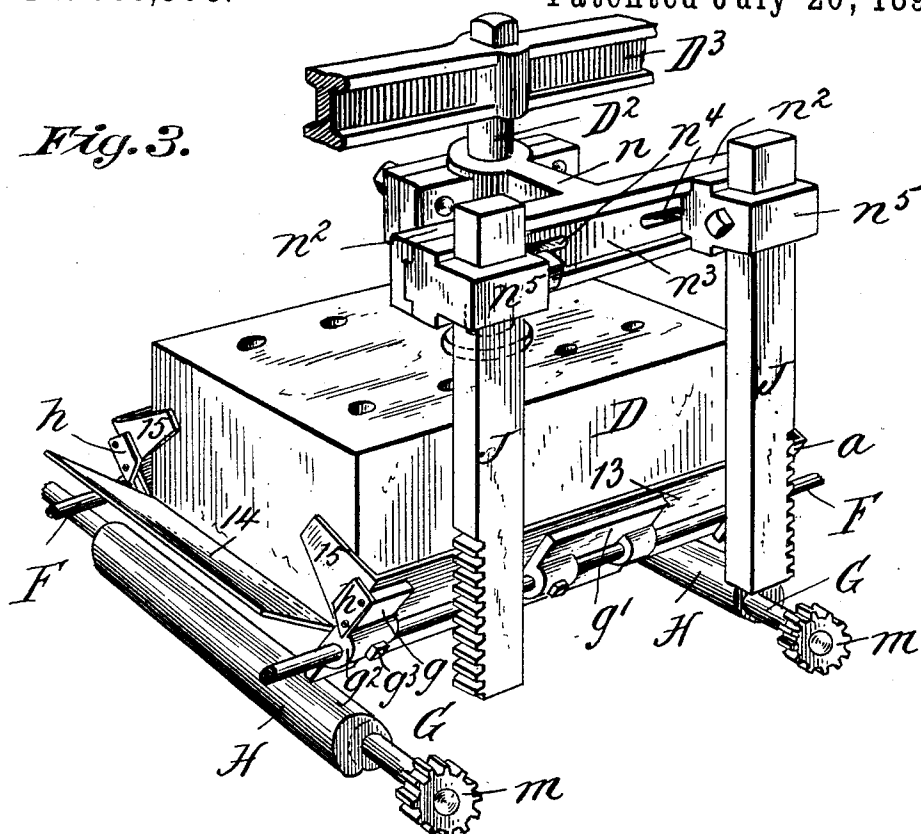


Fig. 3.

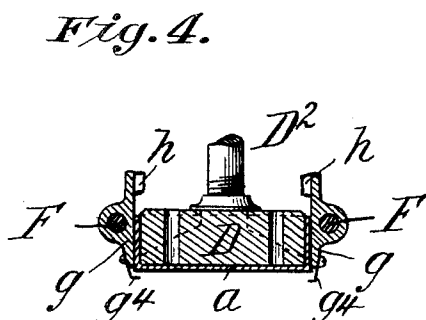


Fig. 4.

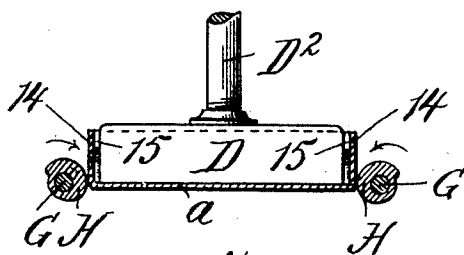


Fig.5.

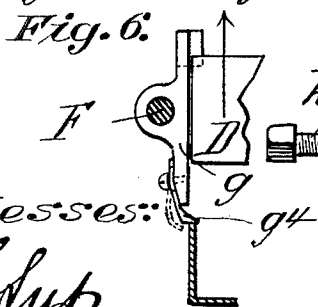


Fig. 6:

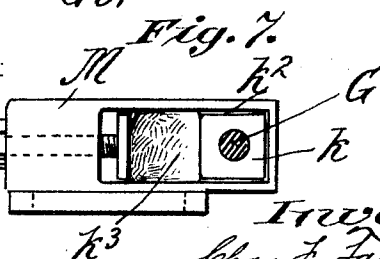


Fig. 7.

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Fig. 8.

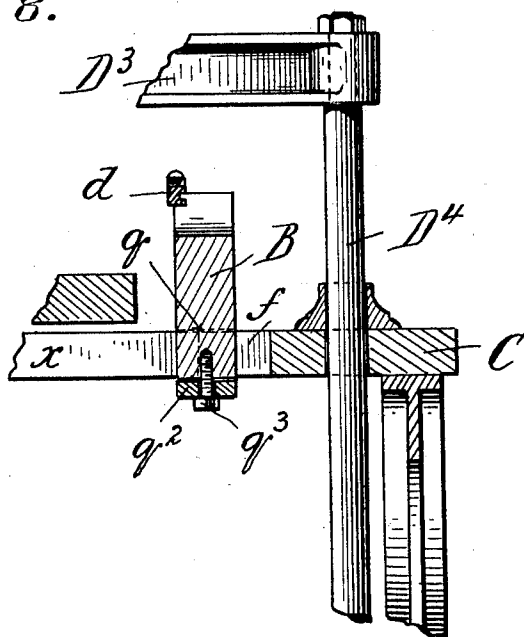
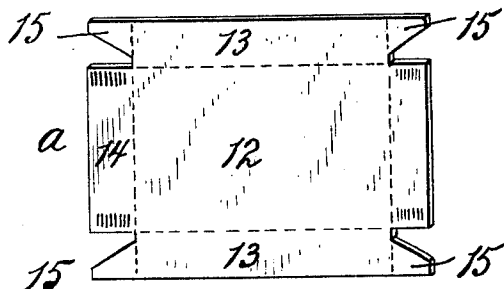


Fig. 9.



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UNITED STATES PATENT OFFICE.

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MASSACHUSETTS.

PAPER-BOX MACHINE.

SPECIFICATION forming part of Letters Patent No. 586,803, dated July 20, 1897.

Application filed February 21, 1896. Serial No. 580,220. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. TAYLOR, a citizen of the United States, and a resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Paper-Box Machines, of which the following is a specification.

This invention relates to machines for making paper or cardboard boxes from blanks having flaps and stay-sections substantially such as illustrated in the accompanying drawings.

The object of this invention is to produce an improved machine for making boxes of the description named which is very simple and inexpensive in construction and which may be easily adjusted and arranged for adapting it to the production of boxes which are variable as to length or breadth, or both.

The invention consists in certain novel constructions, parts, and combinations thereof, all substantially as will hereinafter fully appear, and be set forth in the claims.

The present improvements are fully and clearly illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the improved machine. Fig. 2 is a vertical section thereof, taken on the line 2 2, Fig. 1. Fig. 3 is a perspective view illustrating the novel folding or flap-turning devices. Fig. 4 is a vertical sectional view through the plunger and through the side-flap turners, the plunger being understood as being in a position relative to the said folders which it assumes in its downward movement. Fig. 5 is a sectional view showing the plunger and the devices that cooperate with the plunger which set the end flaps. Fig. 6 is a view illustrating an appliance mounted on the side-flap folder for checking any tendency of the completed box to return upwardly with the rising retreating plunger. Fig. 7 is a side view of the adjustable journal-box for one end of the end-setting device. Fig. 8 is a sectional view on line 8 8, Fig. 2. Fig. 9 is a plan view of the blank from which the box is made.

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

The novelties in the present machine reside in the folding or flap-turning mechan-

isms and adjuncts thereof and also in certain improved means whereby the bars of the blank-conveyer are adjustable transversely of their length, so that they may advantageously engage and carry blanks of varying lengths.

Some of the mechanisms and movements of the machine on which the present improvements are applied are analogous to those which have been heretofore commonly and extensively used in envelop-machines, and in this connection it will be noted that the blanks (indicated at *a* in the drawings) are provided in a pile and picked up by picker- and-gummer mechanism in the ordinary way.

The gummers (indicated at *b* by dotted lines) are preferably adjustable, so that the gumming members *b*² thereof may have approached or widened relations to correspond to the size and shape of the blanks. Such picker-gummers are common in the art to which this invention pertains.

The blanks from which the paper boxes are made embody, in addition to the central portion 12, which forms the bottom, (or the top, if for a box-cover,) the side flaps 13 13, the end flaps 14 14, and the stay-sections 15 15. The flaps 13 13 14 14 are folded up right angular to the bottom, and the stay-sections, which are carried by the side flaps, are folded inwardly at right angles and are stuck to the end flaps. (See Figs. 3 and 9.)

The dotted lines in Fig. 9 represent the lines in which the blank is folded. The blanks are usually scored on these lines previous to being placed in the machine to be automatically fed to the box-forming mechanism.

The conveyer A consists of the two conveyer-bars *d* *d*, having hooked ends *d*², as usual, together with the cross-rod *d*³, to which the bars are connected, and the cam-actuated lever *d*⁴ for imparting the bodily movement to the said bar and the slide movements to the conveyer-bars.

The conveyer-bars may have widened or approached positions in setting the machine for work by reason of the binding-nuts *d*⁵ *d*⁵, which engage the rod *d*³ at each side of the said bars. Said bars are supported to slide longitudinally in suitable ways therefor, which are provided in the uprights B B.

These supporting-uprights are mounted at the lateral edges of the opening x through the table C and are transversely adjustable in the ways f . The said uprights have the shoulder g just above their base portions, which fit in the ways and are confined with said shoulders firmly against the marginal portions of the said ways by the clamp plate and nut $q^2 q^3$.

It will be here stated that in the above connection the term "longitudinally" of the machine is employed to designate the direction of movement of the conveyer, while "laterally" and "transversely" are comparatively used to designate direction which is right angular to said feed movement of the conveyer.

D represents the former-plunger, which is of rectangular plan and which is reciprocated vertically by a cam movement, as usual in envelop-machines and in this class of box-machines. The former-plunger is shown as carried at the lower end of the plunger-shaft D^2 , which depends below the cross-head D^3 . The cross-head is supported by the vertical bars D^4 , against which the duplicated cam D^5 operates to lift, the descent being by gravity when the weight of the parts is sufficient, or the descent may be by positively-operating mechanism, not necessary to describe, as the means for acquiring a suitable reciprocatory movement on the plunger constitutes no part of the present invention.

The plunger D is detachably confined in any suitable way on the lower end of the plunger-shaft, whereby one plunger of a given size may be interchanged for one of a different size.

In front and behind the path of the folding-plunger and ranging transversely of the machine in parallelism are the rock-shafts F F, on which are the side-flap turners $g g$ and the stay-section turners $h h$, the latter appearing as right-angular lips on the ends of the side-flap turners. The said rock-shafts are mounted in their horizontal positions in the brackets or standards i therefor, which rise above the table C, and the springs $j j$, applied on the rock-shafts F, maintain such shafts and the said folders g thereon normally in the horizontal positions indicated in Figs. 1 and 2. Said upstanding stay-section turners h are arranged longitudinally of the folders g , being at the lateral edges of said folders and at or near the ends of the same farthest from the former-plunger. The inner ends of the turners g project within or across the path of the plunger, so that when the latter descends by contacting with said inner ends the side-flap turners are tipped up toward and finally are brought against the plunger, as seen in Figs. 3 and 4.

The brackets $i i$, in which the rock-shafts F F are journaled, are adjustable longitudinally of the machine, the slotted bases i^2 and confining-bolts i^3 being practical provisions to this end.

The blank, which is brought by the conveyer over the flap-turners $g g$, is subject to

the coöperative action of said turners and the plunger, the stay-sections extending longitudinally beyond the stay-section turners $h h$, and therefore as the plunger descends the stay-sections are caused to assume angular relations to the general plane of the blank and toward the ends of the plunger, followed by the upturning of the side flaps as caused by the rocking of the side-flap turners $g g$.

The descending plunger forcing the blank downwardly causes the end flaps to be turned upwardly toward the end of the plunger by reason of the impingement of said flaps against the conveyer-bars, below the plane of which bars the blank is borne, and the side flaps and stay-sections having been brought into contact with the sides and ends of the plunger about the time the blank is brought to the opening x in the table the partially-turned end sections may be now set against the stay-sections by the operation of the end-setting mechanism, which will be now described.

G G represent rock-shafts which are mounted below the aforesaid rock-shafts F, on which the side-flap turners are mounted and at right angles thereto. These rock-shafts have formed or affixed thereon the eccentrics or cams, having peripheries as long as the width of the widest boxes to be made in the machine.

Each rock-shaft G has on its end a pinion m . The plunger D has combined to move in unison therewith the depending rack-bars J J, which when the plunger is elevated are out of mesh with said pinions G, but which as the plunger approaches the limit of its downward movement are brought into mesh with the said pinions, causing such a rocking movement of the rock-shafts as to bring the more prominent portions of the end setters H H to pressure against the end flaps, (near the ends of which the gum has been applied,) forcing and setting them hard against the stay-sections $15 15$, the latter being in contact against the ends of the folder-plunger. The said rock-shafts G G are mounted in the journal-blocks k , each of which is movable in the aperture k^2 therefor in the bracket M and against the cushion or spring k^3 , (see Fig. 7,) the said cushion being under a variable compression as effected by the adjusting-screw k^4 . Each of the said brackets M is, as permitted by the confining bolt and slot seen at k^5 , adjustable transversely of the machine, so that the end-setting mechanism may be farther separated or approached to accord with the variability in the lengths of the boxes to be made in the machine.

It will be perceived on reference to Figs. 1, 2, and 3 of the drawings that the rack-bars J J are adjustable, in order that their coöperative action with the end-setting devices may always be maintained.

The plunger-shaft D^2 is seen to have the rearwardly-projected bracket n , having thereon the horizontal transversely-ranging mem-

ber n^2 , which has the grooved ways n^3 and also the slots n^4 . The rack-bars are secured in clips or clamp-blocks n^5 , which are movable in said ways, and said clamp-blocks are retained in their set positions by the confining-bolts n^6 .

The side-flap and stay-section turners g h are adjustable along the length of the rock-shaft which carries them by the provision of the perforated hubs g^2 of the turners g , whereby the latter may be slid along the rock-shaft, and the set-screws g^3 .

As seen, in addition to the turners g g , which operate at the corners of the box, there is on the rock-shaft another somewhat similar turner, (designated by g'), which advantageously assists in the turning up and forcing of the side flap against the plunger, preventing warping or bulging.

One or more of the side-flap turners g g or g' has projecting below its lower edge a spring-finger g^4 , the action of which is indicated in Figs. 4 and 6. The plunger finally forcing the blank below the turners g g —as low, for instance, as seen in Fig. 6—snaps past the angular extremity of the said spring-finger g^4 , which gives way thereto, assuming a position above the upper edge of the box and serving to strip the box from the plunger as the latter returns upwardly.

It will be observed in this machine that the plunger and the rack-bars movable in unison therewith effect in proper time and without any special cam-actuated mechanisms the rocking movements of the side-flap and stay-section turners and the rolling movements of the end-setting devices.

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

1. In a paper-box machine the combination with a reciprocatory former-plunger, of flap-turners mounted to have rocking movements and having portions thereof extending across the path of the plunger, said flap-turners having the spring-fingers projecting beyond their inner edges for preventing the finished box from being carried with the plunger on the return of the latter, substantially as described.

2. In a paper-box machine the combination with the reciprocatory former-plunger of the rolls having eccentric peripheries, mounted in parallelism at opposite sides of and adjacent the path of the plunger, having a length greater than that of the adjacent surface of the plunger, means for causing the rolling movement of said rolls in conjunction with the descent of the plunger, and opposing paired flap-turning mechanism bodily adjustable toward and away from the plunger in lines at right angles to the length of said eccentric rolls, substantially as described.

3. In a paper-box machine the combination with an interchangeable reciprocatory former-plunger, of a flap-setting mechanism consisting of rolls having cam-like peripheries

and yielding journal-supports in which said rolls are mounted which are adjustable transversely of the lengths of the rolls, and all arranged for operation to set the flap of a paper box against the former, substantially as described.

4. In a paper-box machine the combination with an interchangeable plunger, the end-setting cam-rolls having the gears thereon, and adjustable supports in which said rolls are journaled of the racks mounted to move in unison with the plunger and adjustable toward and from each other, substantially as and for the purpose set forth.

5. In a paper-box machine the combination with the plunger-shaft and interchangeable plunger, the adjustable end-setting cam-rolls having the gears thereon, and adjustable supports in which said rolls are journaled, of the bracket n having the member n^2 which has the slideway n^3 and the slots n^4 the clips or blocks n^5 adjustably fitted in said ways, the confining-bolts n^6 , and the rack-bars, J J , supported by said blocks n^5 , substantially as described.

6. In a paper-box machine in combination the table having an opening therethrough, a former-plunger, rocking side-flap turners having the stay-section turners mounted thereon, with portions of said flap-turners projecting across the path of the plunger, said folders being adjustable bodily longitudinally of the machine and individually adjustable transversely of the machine, and end-setting devices which are adjustable transversely, substantially as described.

7. In a paper-box machine the combination with the table having an opening therethrough of side-flap turners, with the stay-section turners thereon, mounted to have rocking movements, having portions thereof extending across the path of the plunger, and being individually adjustable transversely of the machine and the conveyer having the horizontal bars thereof adjustable transversely, substantially as described.

8. In a paper-box machine the combination with the plunger, of the rock-shafts and longitudinally-adjustable brackets in which said rock-shafts are journaled, the side-flap turners g g individually adjustable along said shaft, having portions thereof projected inwardly across the path of the plunger and each having the upstanding lip or flange h which constitutes a stay-section turner, the intermediate auxiliary side-flap turner g' on each rock-shaft, and springs applied on said shafts for normally maintaining the flap-turners in horizontal positions, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two witnesses.

CHAS. F. TAYLOR.

Witnesses:

Mrs. G. J. KEATE,
WM. S. BELLWS.