

(No Model.)

2 Sheets—Sheet 1.

C. KLONINGER & J. E. BUTTON.
FOLDING MACHINE.

No. 573,603.

Patented Dec. 22, 1896.

Fig. 1.

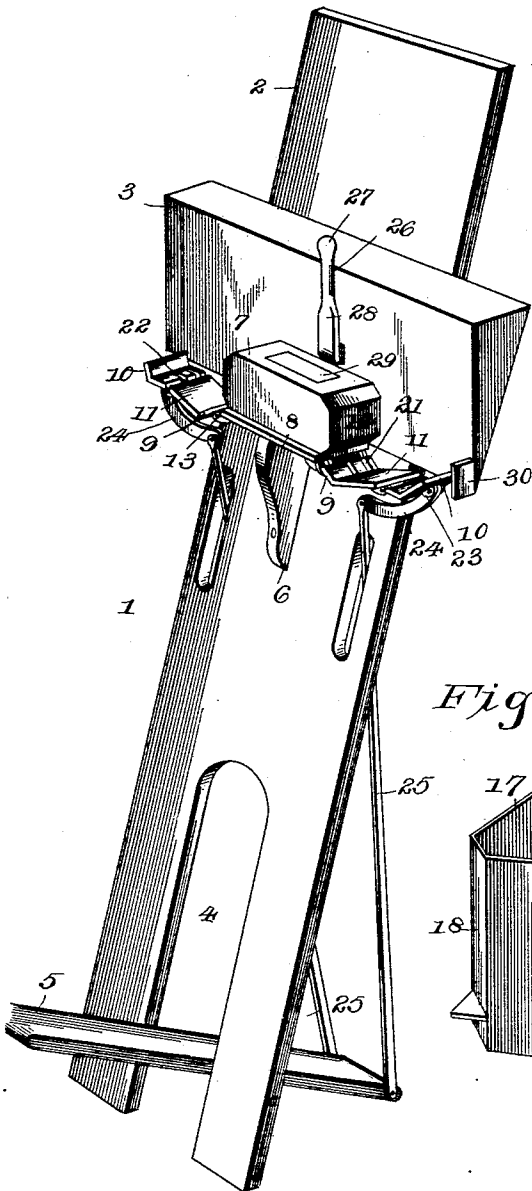


Fig. 2.

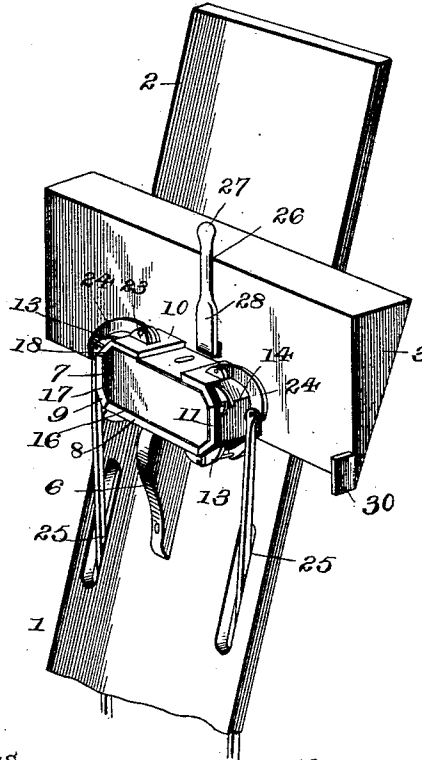
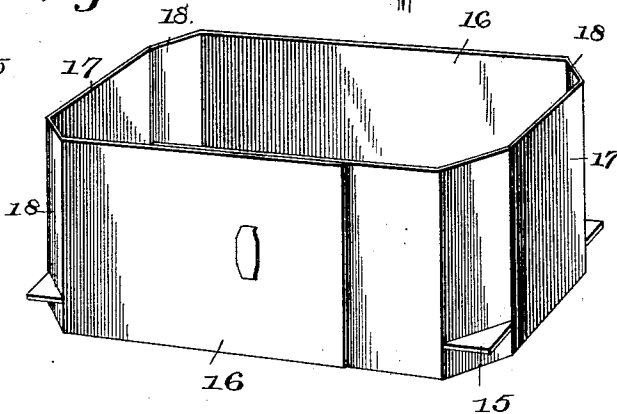


Fig. 6.



Inventors

Charles Kloninger,
and John E. Button,

By their Attorneys.

Witnesses

Charles Ford.
[Signature]

Chas. Snow & Co.

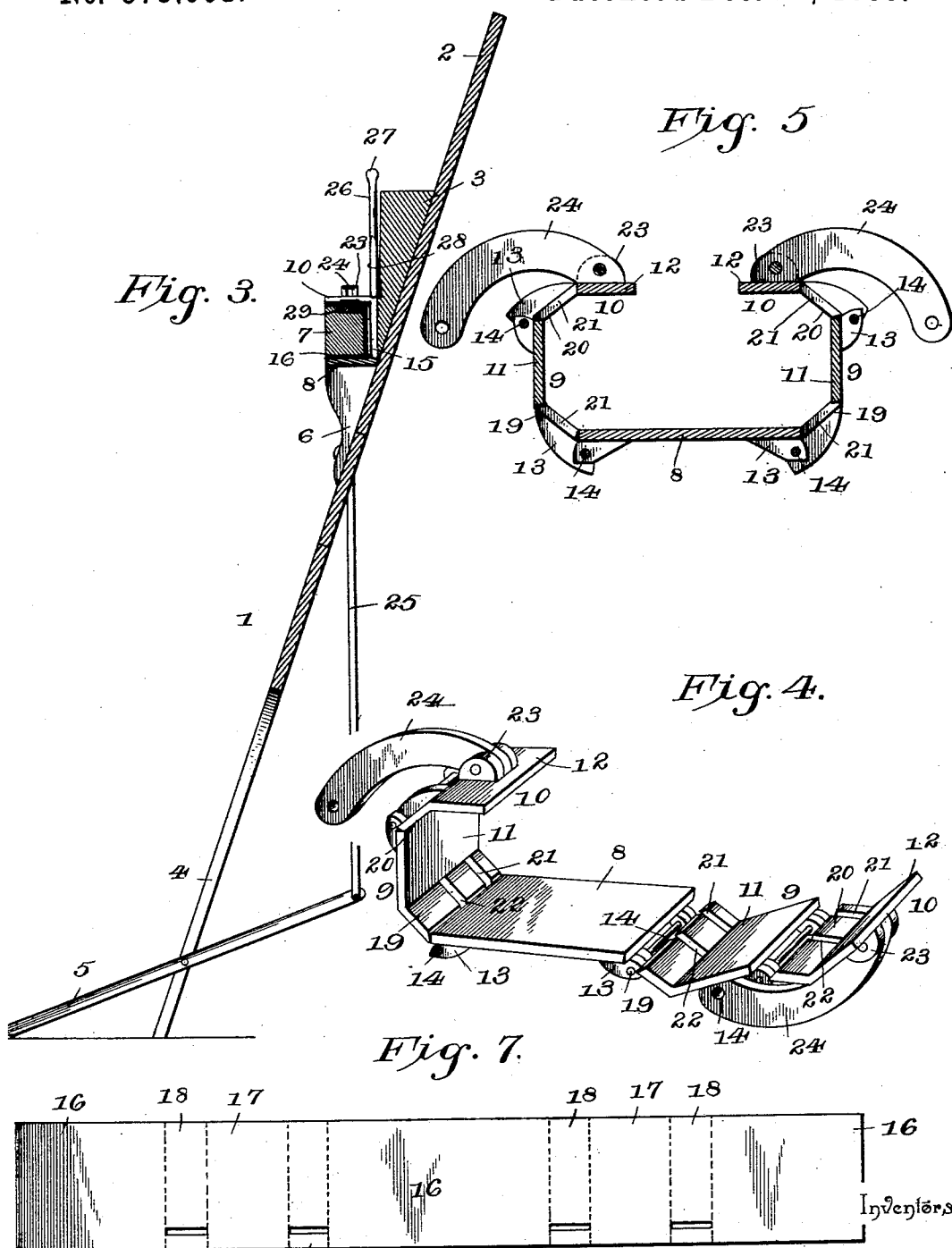
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2 Sheets—Sheet 2.

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Witnesses

Chas. A. Ford.

[Signature]

Charles Kloninger,
By their Attorneys, John E. Button,

[Signature]

UNITED STATES PATENT OFFICE.

CHARLES KLONINGER AND JOHN E. BUTTON, OF SALT LAKE CITY, UTAH.

FOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 573,603, dated December 22, 1896.

Application filed March 28, 1895. Serial No. 543,510. (No model.)

To all whom it may concern:

Be it known that we, CHARLES KLONINGER and JOHN E. BUTTON, citizens of the United States, residing at Salt Lake City, in the county of Salt Lake and State of Utah, have invented a new and useful Folding-Machine, of which the following is a specification.

Our invention relates to box-making machines, and particularly to mechanism for folding the blanks of berry-boxes and holding them in position for fastening; and the object in view is to provide an improved and simplified construction and arrangement of parts whereby the folder is opened and closed solely by foot-power to leave the hands of the operator free to secure the overlapping ends of the blank when folded.

Further objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a box-machine constructed in accordance with our invention with the folder extended in position to receive a side blank. Fig. 2 is a similar view of a portion of the machine, showing the folder in the position which it assumes to fold the blank around the forming block or core. Fig. 3 is a vertical section. Fig. 4 is a detail view in perspective of the folder. Fig. 5 is a detail sectional view of the same. Fig. 6 is a detail view in perspective of a completed berry-box. Fig. 7 is a plan view of the side blank of the box.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a frame consisting of a plank 2, which is inclined slightly to the rear toward its upper end, and a cross-piece 3, which is secured to said plank, said plank being provided at its lower end with a vertical slot or opening 4, in which is pivotally mounted a foot-treadle 5. Secured to the front of the frame, near the plane of the lower edge of the cross-piece 3, is a bracket 6, adapted to support a forming block or core 7, which is thus arranged contiguous to and parallel with the plane of the cross-piece 3, said block or core being arranged upon its edge on the bracket. The horizontal shelf 8, which forms a part of

the bracket and is secured to the member 9 thereof, also forms one member of a folder, and hinged to the extremities of this main member 8 are the sectional end members 10, each comprising a leaf 11 and a flap 12, pivotally connected or hinged at their adjacent edges. The joints between the various members and sections of the folder are formed by ears 13, integral with the members and provided with registering openings in which are fitted bolts or pivot-pins 14, said ears being offset from the planes of the various members to allow the latter to separate at their edges as the folder is opened and thus entirely release the box after construction without straining or offering resistance to such operation. This is shown clearly in Fig. 2.

It is obvious that the specific construction of the folder depends upon the construction of the box to be formed thereby and must comprise a greater or less number of leaves and flaps according to the number of sides in the box, only two sides being conveniently formed by one leaf or flap; but in the construction illustrated the folder is adapted for forming a box which is known to the trade as the "Leslie berry-box," the same being shown in Fig. 6, and comprising a flat oblong bottom 15, sides 16, and ends 17, the sides and ends being connected by diagonally-disposed folds 18, which are slotted in the plane of the bottom to receive the corners or angles of the bottom, this being the means whereby the bottom is secured in place. In order to form a box of this construction, the improved folder is provided with leaves 11, having slotted angularly-disposed flanges 19, which are equal in area to the folds at the angles of the box, and are disposed at angles from the plane of the body portions of the leaves to correspond with the angles between the folds of the box and the sides and ends thereof. These flanges are duplicated, as shown at 20, upon the corresponding edges of the flaps 12 to correspond with the remaining two angularly-disposed folds of the box, and said flanges are provided near one edge of the folder with slots 21 to receive the angles of the bottom of the box and at intermediate points with similar slots 22 for a similar purpose when a box of less depth than that shown in the drawings is to be constructed. In other words,

the slots 21 are adapted to receive the angles of the bottom of the box when it is desired to form a quart and the slots 22 when it is desired to form a pint box.

5 Secured by means of ears 23 to the outer surfaces of the flaps 12 of the folder are the inner ends of levers 24, and the outer extremities of these levers are connected by means of pitmen 25 with the rear end of the foot-treadle 5.

10 Hinged to the frame above the plane of the forming block or core is a clip-applying lever 26, having a handle 27 and a metallic face 28, which may be brought into a position parallel with the upper face of the forming block or core, and a metallic plate 29 is arranged upon the upper face of said forming-block to receive the pressure of said lever, as herein-after fully explained.

20 From the above description it will be seen that the construction of the apparatus is simple, and in order that the operation thereof may be fully understood it is briefly described as follows:

25 The blank, as shown in Fig. 7, is arranged upon the body portion 8 of the folder with its extremities respectively in contact with gage-blocks 30, arranged near the outer extremities of the cross-piece 3, and the forming block or core is disposed upon the inner surface of said blank above the main portion of the folder, the construction of this forming block or core corresponding with the shape and inner dimensions of the box to be constructed. The parts being thus disposed, the front end of the foot-treadle is depressed, thereby causing the elevation of the leaves and flaps of the folder, which are carried around the forming block or core until the body portions of the flaps 12 are parallel with the upper surface of the forming-block and the extremities of the blank are overlapped upon said upper surface of the block. While the parts are held in these relative positions a clip is applied to the overlapping ends of the blank to secure them in place, and the means which we have provided for applying this clip consists of the above-described lever 26, which, when brought down to a position parallel with the upper surface of the forming block or core, forces a clip through the overlapping extremities of the blank and causes the points or ends of the clip to be turned up or clenched by contact with the metallic plate secured to the block. A clip suitable for use in this connection is shown securing the extremities of the blank in Fig. 6.

After the depression of the lever and the proper arrangement of the securing-clip the foot-treadle is released, thereby allowing the movable members of the folder to be extended to the position shown in Fig. 1 and release the box. The bottom of the box having been arranged upon the bracket parallel with the forming block or core extends at its angles through the slots in the side blank and also through the slots in the flanges of the leaves

11 and flaps 12, whereby the fastening of the extremities of the side blank secures all of the parts of the box in position.

70 From the above description it will be seen that each end member of the folder consists of only two connected sections, and that the means provided for closing and opening the folder include inflexible pitmen, which are connected, respectively, to the terminal sections. The connections between the pitmen and the terminal sections of the end members consist of rigid curved or arc-shaped arms having their outer extremities approximately upon an extended line connecting the pivots 14 of the terminal sections and the points of attachment of said curved arms to the sections, whereby each arm constitutes a lever, which, when elevated at its outer extremity by the upward movement of the pitmen, turns upon its fulcrum formed by said pivot 14 and thus forcibly depresses the inner end of the section. Hence by means of inflexible pitmen and the peculiar form of the connections between the pitmen and the terminal sections of the end members we are enabled to forcibly close the folder and impart positive downward pressure to the terminal sections. The arms 24 extend beyond the pivots 14 of the terminal sections, whereby when said sections are folded back or opened, as indicated at the right in Fig. 4, vertical upward pressure upon the extremities of the arms is in line with the inner sections or leaves 11 of the end members between the pivots 14, by which said inner sections or leaves are connected, respectively, to the main member 8 and the terminal members or flaps 12, the extremities of said arms being adapted to bear against the outer surfaces of said inner sections or leaves to positively communicate upward pressure thereto in closing the folder.

It is obvious that various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described our invention, what we claim is—

1. In a machine of the class described, the combination with a forming block or core, of a sectional folder adapted to extend around the block or core and comprising a main or lower member and sectional connected end members, the terminal sections of the end members having curved arms terminating beyond the inner ends of said sections, and means for closing and opening the folder including inflexible pitmen connected solely to the extremities of the arms on the terminal sections of the end members, said arms being adapted to bear at their extremities upon the outer surfaces of the inner sections of the end members to communicate motion thereto, substantially as specified.

2. In a machine of the class described, the combination with a forming block or core, of a folder having a main or stationary member

and pivotally connected sectional end members adapted to overlap the upper side of the block or core, arms attached, respectively, to the terminal sections of the end members and adapted when said sections are folded back to bear at their outer extremities against the outer surfaces of intermediate sections of the end members, and means for imparting upward pressure to said outer extremities of the arms, substantially as specified.

3. In a machine of the class described, the combination with a forming block or core, of a folder having a stationary main member and pivotally-connected sectional end members, each comprising a leaf and a connected flap, the latter being adapted to fold upon the upper side of the block or core, curved arms 24 secured to the terminal sections or flaps of the end members and extending outwardly beyond the pivotal points of the flaps whereby their extremities are adapted to bear against the outer surfaces of said leaves, and means for imparting upward pressure to the extremities of said arms, the same including inflexible pitmen attached to said extremities and adapted to force the same

against the outer surfaces of the leaves, substantially as specified.

4. In a machine of the class described, the combination with a forming block or core, of a folder having a stationary main member and pivotally-connected sectional end members each comprising a leaf 11 having an angularly-disposed flange provided with a plurality of slots, 21, 22, parallel with the front edges of the members, and flaps 12 having angularly-disposed flanges provided with corresponding slots arranged, respectively, in the planes of those in the flanges of the leaves, and means, including arms attached to the terminal sections or flaps, for communicating motion to the end members and folding the same upon the block or core, substantially as specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

CHARLES KLONINGER.
JOHN E. BUTTON.

Witnesses:

D. H. WENGER,
W. E. STEWART.