

No. 634,627.

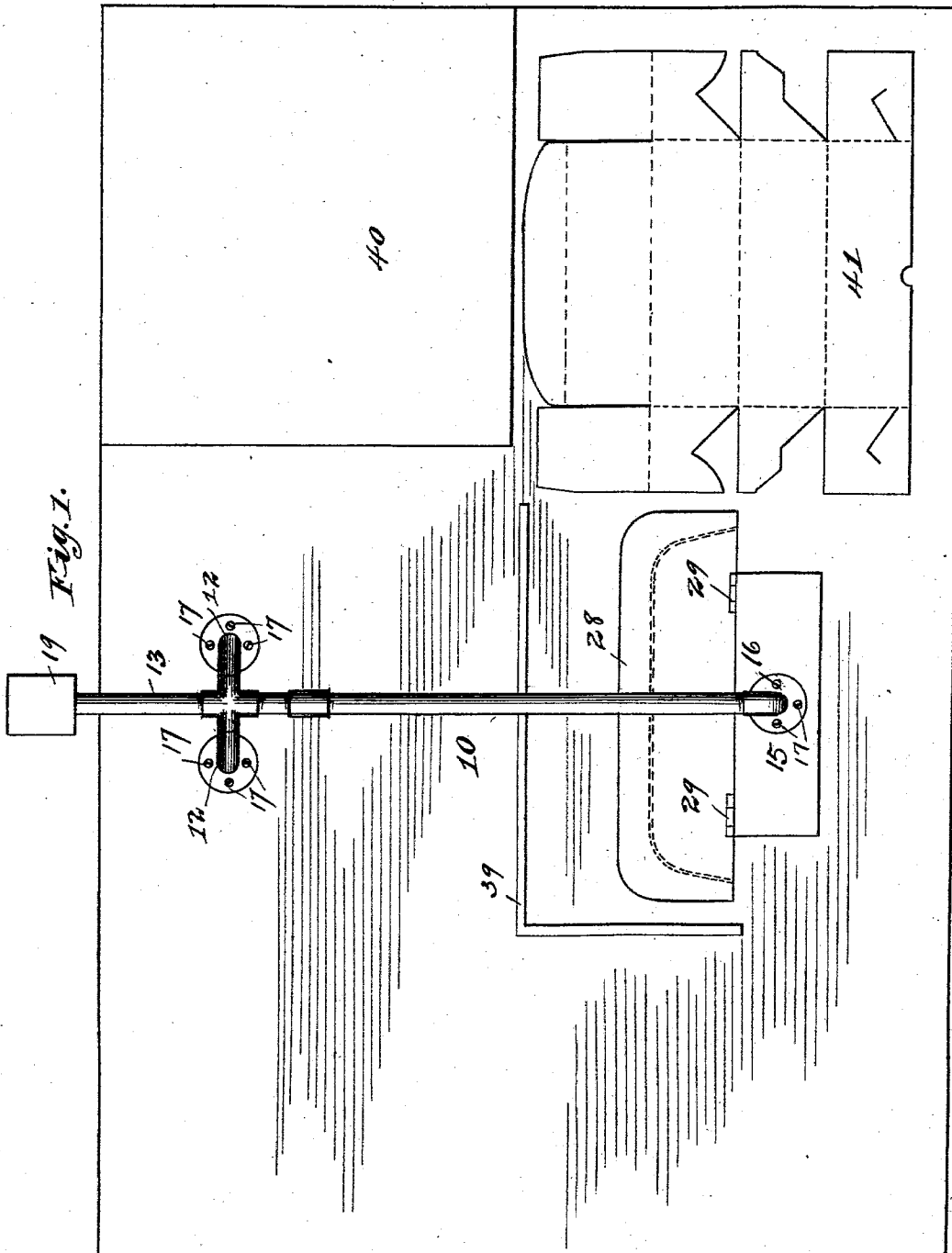
Patented Oct. 10, 1899.

F. M. PETERS.
PAPER BOX MACHINE.

(Application filed Mar. 6, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses
F. M. Peters
Frederick Goodum

Inventor,
Frank M. Peters.
By Offield, Fowler & Lintineum,
Attys.

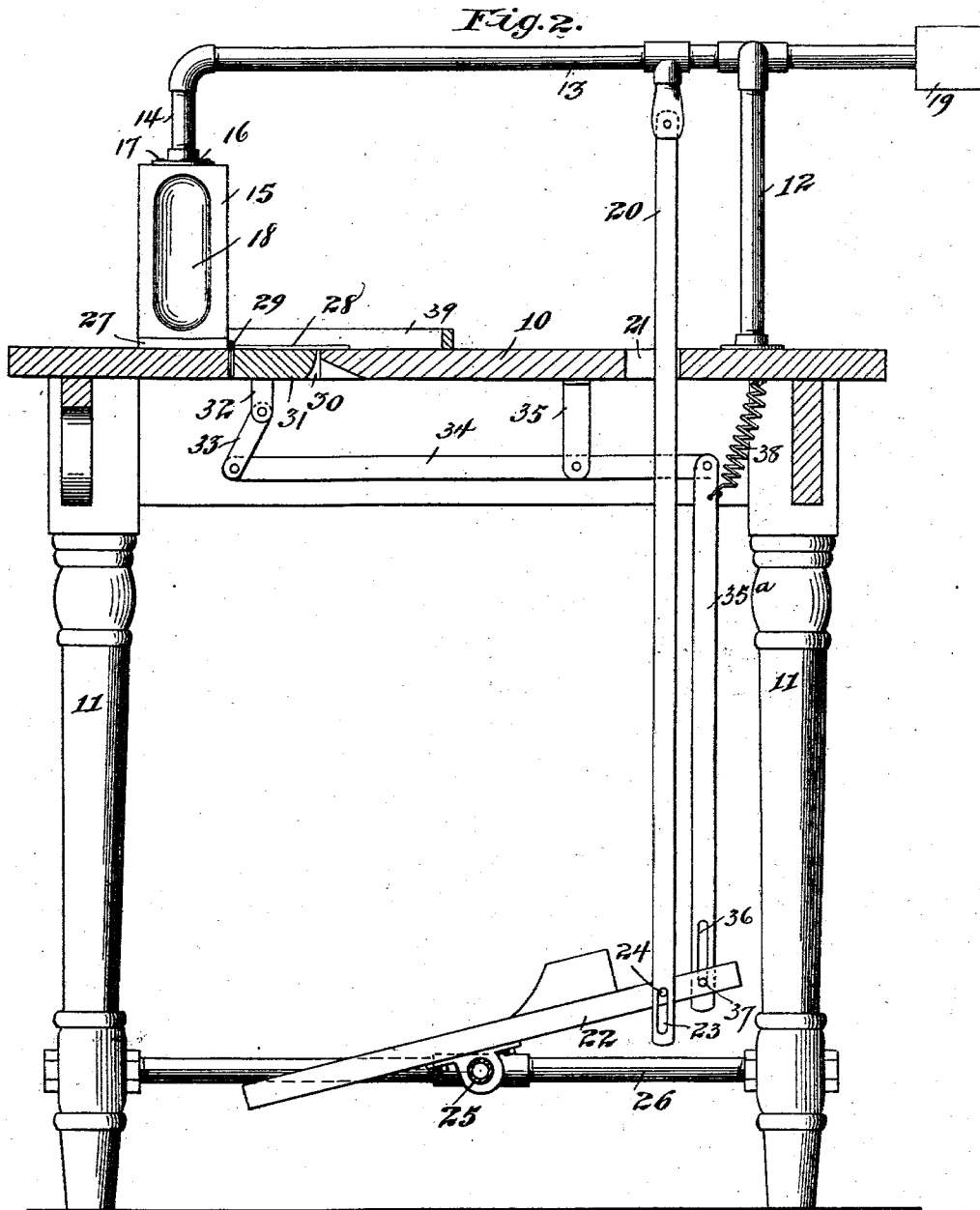
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Witnesses,
F. M. Peters
Frederick Goodwin

Inventor,
Frank M. Peters,
By *Offield, Powell & Lenthicum*
Attys.

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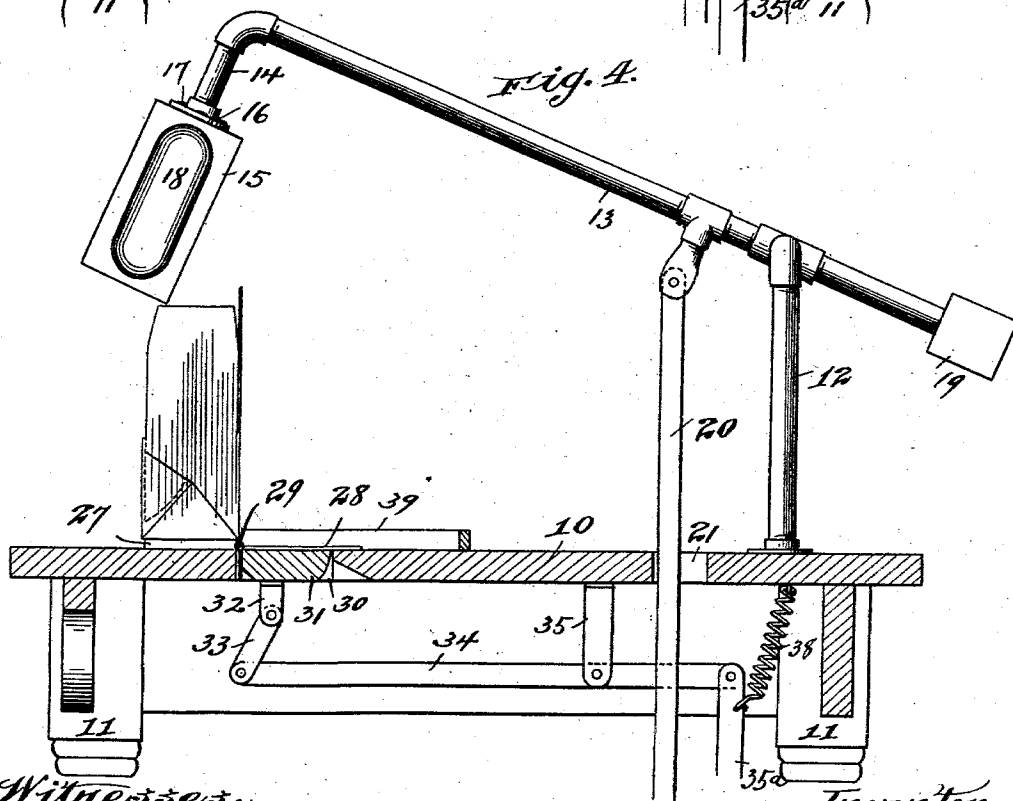
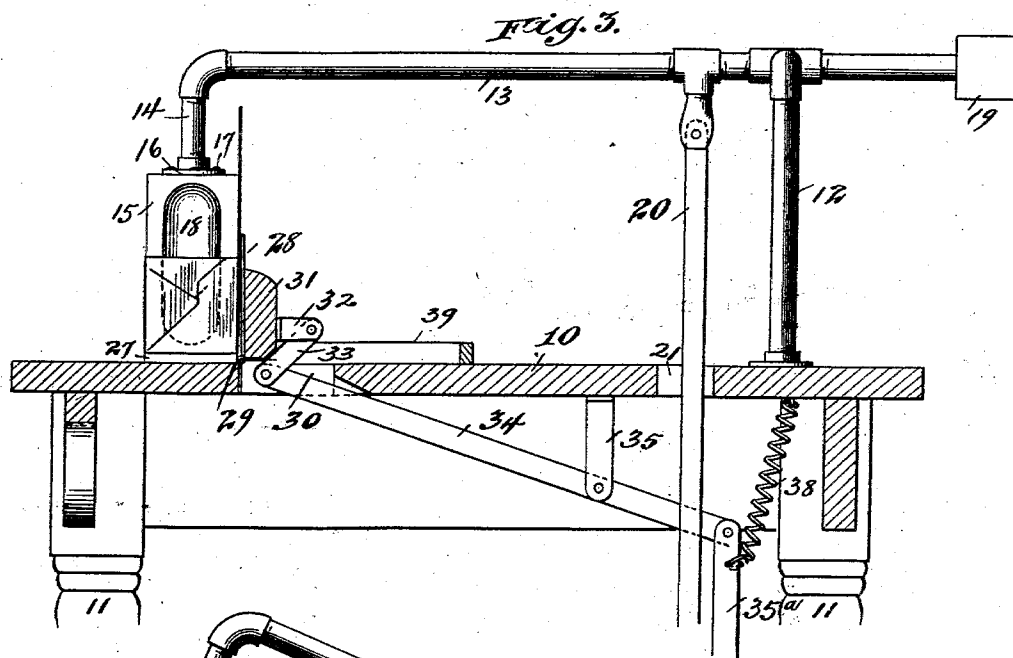
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Witnesses,
S. B. Mann,
Frederick Goodwin

Inventor,
Frank M. Peters,
By Offield, Fowler & Lathrop,
Attys.

UNITED STATES PATENT OFFICE.

FRANK M. PETERS, OF CHICAGO, ILLINOIS.

PAPER-BOX MACHINE.

SPECIFICATION forming part of Letters Patent No. 634,627, dated October 10, 1899.

Application filed March 6, 1899. Serial No. 707,985. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. PETERS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Paper-Box Machines, of which the following is a specification.

This invention relates to paper-box machines, and has for its object to provide means whereby boxes of paper or other like material of the type known as "folding" or "knock-down" boxes may be readily and expeditiously assembled or set up so as to bring them into proper form and condition to receive their contents. The apparatus is more particularly devised for the purpose of carrying out the method and producing the means for packing biscuit, crackers, or the like set forth in an application filed by me November 28, 1898, Serial No. 697,661, but is adapted, of course, for use in setting up folding paper boxes of various types and is not limited in its application to the specific method and structure set forth in my above-specified prior application.

The present invention consists in certain novel features which I will now proceed to describe, and will then particularly point out in the claims.

In the accompanying drawings, Figure 1 is a plan view of an apparatus embodying my invention in one form. Fig. 2 is a side elevation in section through the table, showing the machine in the position it assumes before the beginning of operation. Fig. 3 is a view similar to Fig. 2, showing the position of the parts during the operation of folding up the carton or blank into a box; and Fig. 4 is a similar view showing the position of the parts after the operation of folding the box in the machine has been completed and the former has been raised to strip the box therefrom.

In the said drawings, 10 indicates a suitable table or bed, which may be supported in any suitable manner—as, for example, by the legs 11—and has mounted thereon a standard 12, on which is pivotally mounted the box-former-carrying arm 13. The forward end of this arm is extended downward, as indicated at 14, and has secured to it the box-former 15. Said former may be made of any suitable material and size and is of a shape and size substantially identical with

that of the interior of the box. In practice I have found it convenient to make this former of wood and to secure it to the lower end of the arm 13 by means of a disk 16 and fasten-
ing-screws 17, passing through said disk into the former, so that this latter may be readily removed, if desired. The former is recessed at its ends, as indicated at 18, for the purposes hereinafter described. I find it convenient to provide the arm 13 with a counterweight 19 at its end opposite to that to which the former is secured in order to counterbalance this latter.

In order to provide means for moving the former 15 toward and from the table 10, I employ an operating-rod 20, the upper end of which is pivotally connected to the arm 13, said rod passing downward through a slot 21 in the table 10 and being connected at its lower end to a foot-lever 22, which is pivotally mounted on a suitable support between its ends. The connection between the foot-lever 22 and rod 20 is a lost-motion connection or one such as to permit of the free downward motion of that end of the lever to which the rod is connected without moving the rod, while upward motion of said end of the lever from its normal position will cause said rod to move upward. A simple and effective means of effecting this connection is that shown in the drawings, in which the rod 20 is provided with a slot 23 in its lower end, and the lever 22 is provided with a pin 24, which engages said slot and which when pressed against the upper end thereof serves to lift the rod, the arm 13, and the former 15. The foot-lever 22 is supported on a shaft or axis 25, which is in turn supported on cross-pieces 26, connecting the legs 11, or said foot-lever may be supported in any other suitable manner.

Upon the table 10 there is provided, immediately under the former 15, an upwardly-projecting block or platen 27, which is of a size substantially equal to that of the bottom of the box, and consequently to the under face of the former 15. Immediately adjacent to said platen and rearward thereof there is located a folding-blade 28, which is pivoted at 29 by its edge nearest to said platen and is adapted to lie normally horizontally upon the table, but being capable of being swung up

at right angles thereto, as indicated in Fig. 3. In order to operate this folding-blade, there is provided underneath the same an opening 30 in the table 10 to receive a block 31, secured to the under side of the blade 28 and having a projection 32, to which is pivoted one end of a link 33. The other end of the link 33 is pivoted to the front end of a lever 34, which lever is itself pivoted between its ends to a downward projection 35 from the under side of the table 10. To the rear end of the lever 34 is pivoted the upper end of a rod 35^a, the lower end of which rod is connected to the rear end of the foot-lever 22. The connection between the rod 35^a and foot-lever 22 is similar to that between the rod 20 and said foot-lever 22, but reversed, being a lost-motion connection, which will impart movement to the rod 35^a when the rear end of the foot-lever 22 is depressed, but which will leave said end of said lever free to move upward without imparting motion to said rod. As shown, this connection is effected by providing the lower end of the rod 35^a with a slot 36, while the foot-lever is provided with a pin 37 to engage said slot and bear against the lower end thereof when the foot-lever is depressed. In order to return the several parts just referred to to their normal position when the foot-lever is released, I provide a spring 38, which in the present instance is shown as having one end connected to the under side of the table 10, while its other end is connected to the upper end of the rod 35^a. The position and connections of this spring may, however, obviously be varied.

There is provided upon the upper side of the table 10 a rectangular gage 39, by means of which the position of the blank upon the table relatively to the platen and former may be automatically determined, and I prefer to provide upon said table a raised platform or bed 40, upon which the lining-sheets may be placed in case the machine is used in the forming of the packages set forth in my prior application hereinbefore referred to.

In order to make clear the mode of operation of my machine, I will explain the manner in which the same is used in the operation of folding a paper box into such shape and condition as to adapt it to receive its intended contents. The parts being in the position shown in Figs. 1 and 2, the blanks, which are indicated at 41, are placed in a pile at the right hand of the operator. The operator then raises the former 15 by depressing the front end of the foot-lever 22, and thereby raising the rear end, thus imparting an upward motion to the rod 20 and causing the arm 13 to swing upward at its forward end, carrying with it the former. The box-blank is then placed upon the platen 27 and the foot-lever is released, permitting the former 15 to descend upon the blank and hold the same firmly between it and the platen by that portion of said blank which will constitute the bottom of the completed box. The front por-

tion of the blank is then folded up against the former 15, the fold occurring along the front line of the bottom of the box, and the folded portion being retained in position by the pressure of the thumbs of the operator. The end flaps of the front portion of the blank are then folded against the ends of the former by the fingers of the operator, said flaps being folded around the front vertical corners thereof, and the end flaps of the bottom of the box are next folded vertically upward against the end faces of the former around the bottom edges thereof. These several parts thus folded being held in position by the thumbs and fingers of the operator, the back portion of the blank is folded up by means of the folding-blade 28. To accomplish this, the foot-lever 22 is depressed at its rear end, whereupon by means of the rod 35^a, lever 34, and link 33 the folding-blade 28 is swung up into the position shown in Fig. 3, thereby folding the box-blank along the line of the rear edge of its bottom, as shown in said figure. Finally, the locking-flaps of the rear portion of the blank which have thus been brought up into the grasp of the operator are folded forward, and the locking-tongues are tucked into the slits formed to receive them in the front end flaps. It is during this tucking operation that the recesses 18 are of particular utility, since they permit the material of the blank to be pressed inward, so as to cause the slits to open or gap, and this facilitates the introduction of the locking-tongues. The box being thus practically completed to the point where it is ready to receive its contents, the former 15 is withdrawn by again depressing the front end of the lever 22, while the operator restrains the box from moving along with the former, whereupon the box may be removed from under the former and a second blank placed in position, or the former lowered, as may be desired. The raised platen 27 holds the box-blank above the table in such a manner that it may be readily and quickly grasped by the operator and serves to prevent any fumbling of the blank and consequent loss of time. The gage 39 serves in an obvious manner to properly center the blank with relation to the platen and former, while the folding-blade properly folds the inaccessible rear portion of the blank, while the hands of the operator are engaged in holding the previously-folded portions of the blank.

Where packages such as those set forth in my prior application are to be made up by the aid of this machine, the lining-sheets are placed upon the bed or platform 40 and are removed therefrom and placed upon the platen simultaneously with the blanks and folded along with them in the manner set forth in said application. While I prefer to employ the former in such a way as to clamp the box-blank on the table, yet it is not essential that it should actually do so, as it needs only to be brought into juxtaposition thereof in order

to form a guide in the folding of the blank, and where lining-sheets are interfolded with the box-blanks I prefer to arrest the movement of the former immediately above or adjacent to the lining-sheet in order that this latter will not be marred by any pressure from the former.

It will be observed that the table upon which the body of the box-blank rests presents a flat imperforate and fixed resting-surface for the blank as to that portion thereof which lies between the blank and the former when this latter is at its nearest approximation to the table. This is true whether the blank be allowed to rest directly upon the table or whether a platen or block be employed in order to receive this portion of the blank. It will also be observed that by the term "former" I indicate a block or body of a shape and size substantially identical with that of the interior of the completed box and around which the box may be shaped or formed. I do not include in this term "former" forming mechanism which is operative in bending the portions of the blank to bring it to the desired shape.

I have shown a simple, inexpensive, and efficient form of my improved machine; but said form is shown as illustrative only, and I do not wish to be understood as limiting myself strictly to the details therein set forth, which, while some of them embody features of my invention, are merely illustrative of the form thereof, which I prefer. For instance, other mechanism than that shown may be employed for moving the former toward and from the table and for actuating the folding-blade, and some of the features described may be dispensed with without departing from the principle of my invention.

I am aware that it has heretofore been proposed to employ in a paper-box machine a tubular die-block, into which a blank is forced by a plunger to partly fold the same, together with laterally-sliding folders, to bend the other flaps of the box into place. In this construction, however, there is no imperforate table or platen upon which the blank may rest during the operation of folding it up into shape.

I am also aware that it has been proposed to employ a fixed former located in permanent relation to a fixed table on which the blank lies, said table having apertures through which movable forming mechanism is protruded to partly fold the blank around the former. In a machine of this character there has also been employed a swinging plate standing always at an angle above the table in front thereof, and serving, when swung up against the former, to bring into proper relative position thereto a separate box-bottom.

I do not wish to be understood as including within my invention either of the constructions above set forth, from which my machine is clearly distinguished by the presence there-

in of a fixed table or platen which is imperforate as to that portion thereof which is opposite the abutting face of the former, in conjunction with a former movable toward and from said table or platen, and around which former the box-body may be bent to shape, either wholly or partially, by hand or otherwise.

I claim—

1. A machine for making boxes of fixed interior dimensions for packing biscuit, crackers and the like, comprising a former having an outer contour substantially that of the inner fixed contour of the box to be formed, and a bed or table having a flat continuous supporting-surface for the blank, of an area equal to at least that portion of the box-blank forming the bottom of the box when folded, and the table and former having a relative movement, and suitable means for actuating the movable member, substantially as described.

2. In a machine for forming boxes for biscuit, crackers and the like, the combination with a bed or table having a flat continuous supporting-surface for the blank, of a movable former supported above the bed or table and having an external contour substantially like the interior contour of the box to be formed, and means for moving the former into position over the blank to permit the latter to be folded around it and for withdrawing it from the box when formed, substantially as described.

3. In a machine of the character described, the combination, with a bed or table, a former movable toward and from said bed or table, and a swinging folding-blade pivotally supported on said table, of a foot-lever, and connecting mechanism whereby movement of said foot-lever in one direction will actuate the former, while movement of said foot-lever in the opposite direction will actuate the folding-blade, substantially as described.

4. In a box-machine, the combination, with a bed or table having a continuous supporting-surface on which a box-blank may lie flat, of a former movable toward and from said bed or table, said bed or table being provided with an aperture adjacent to the former, a folding-blade pivotally connected with the table above said aperture and normally lying substantially in the plane of its top, and a foot-lever operatively connected with said folding-blade to swing the same upward toward the former and thereby fold the rear portion of the blank against the same, substantially as described.

5. In a box-machine, the combination, with a bed or table, of an arm pivotally supported thereon and carrying a box-blank, a folding-blade pivotally supported on said table, a foot-lever, and operating rods connecting said foot-lever with the former-carrying arm and folding-blade, said rods and foot-lever having a pin-and-slot connection whereby said foot-lever is adapted to actuate either of said

rods without affecting the other, substantially as described.

6. In a box-machine, the combination, with
a bed or table on which the box-blank may
5 lie flat and a former movable toward and from
the same, of a folding-blade pivotally supported
on said bed or table and normally lying
substantially in the plane of its top, a
foot-lever, connecting mechanism between
10 said foot-lever and folding-blade whereby the
latter may be swung against the former, and

means for positively returning said blade to
its normal position, substantially as described.

7. In a machine of the character described,
a box-former having its faces, which receive 15
the tucking-flaps of the box-blanks, recessed
to facilitate the tucking of said flaps, substantially
as described.

FRANK M. PETERS.

Witnesses:

FREDERICK C. GOODWIN,
IRVINE MILLER.