

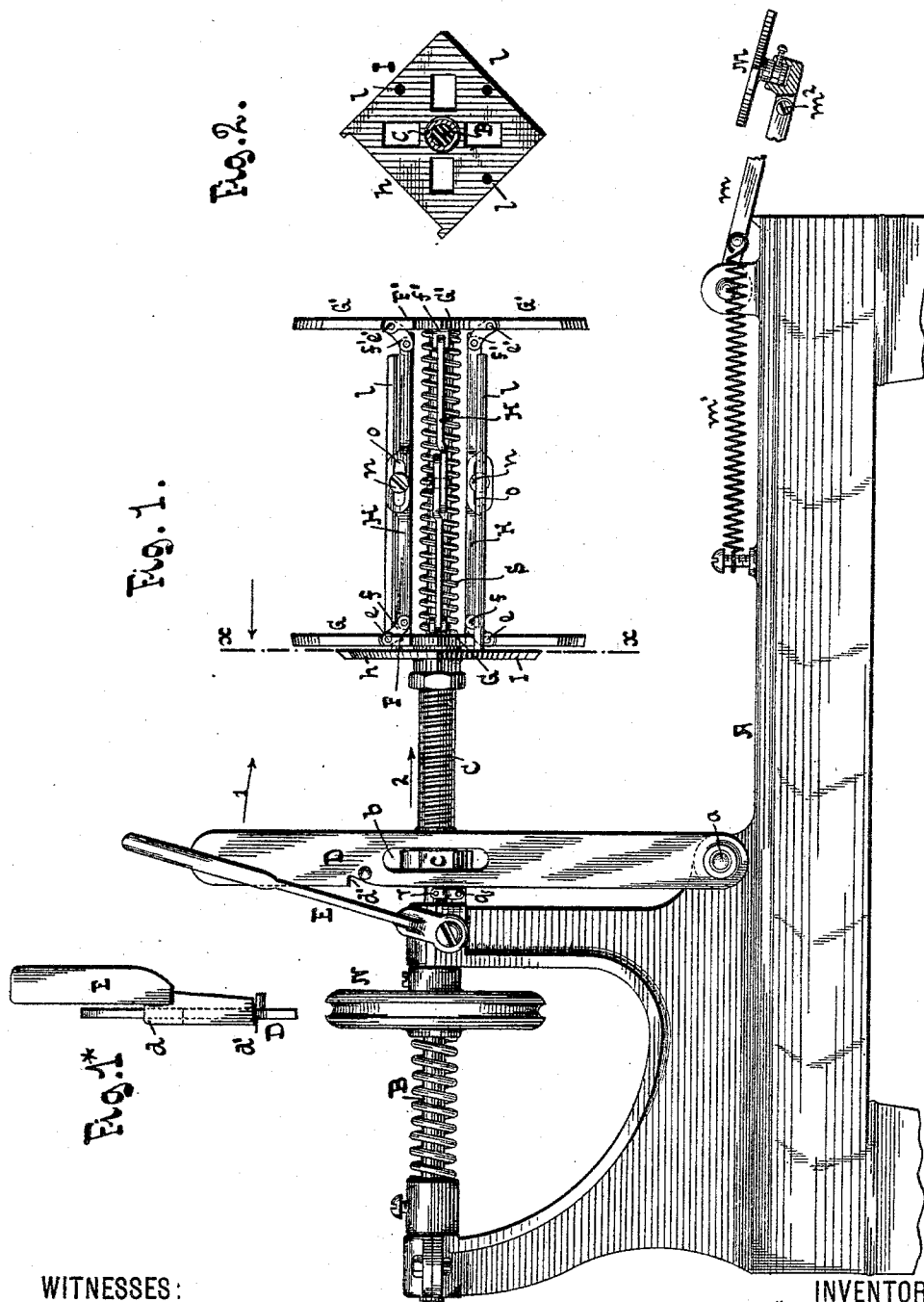
(No Model.)

4 Sheets—Sheet 1.

L. M. MEYER.
BOX FINISHING MACHINE.

No. 414,426.

Patented Nov. 5, 1889.



WITNESSES:

A. Faber du Faur
Edward M. Millan.

INVENTOR

Louis M. Meyer.

BY

A. Faber du Faur
ATTORNEY

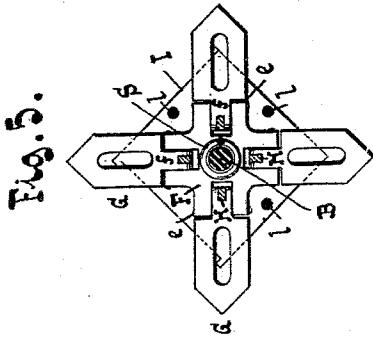
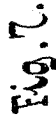
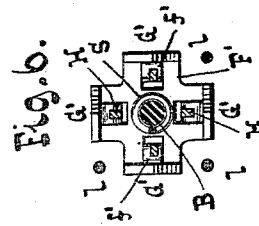
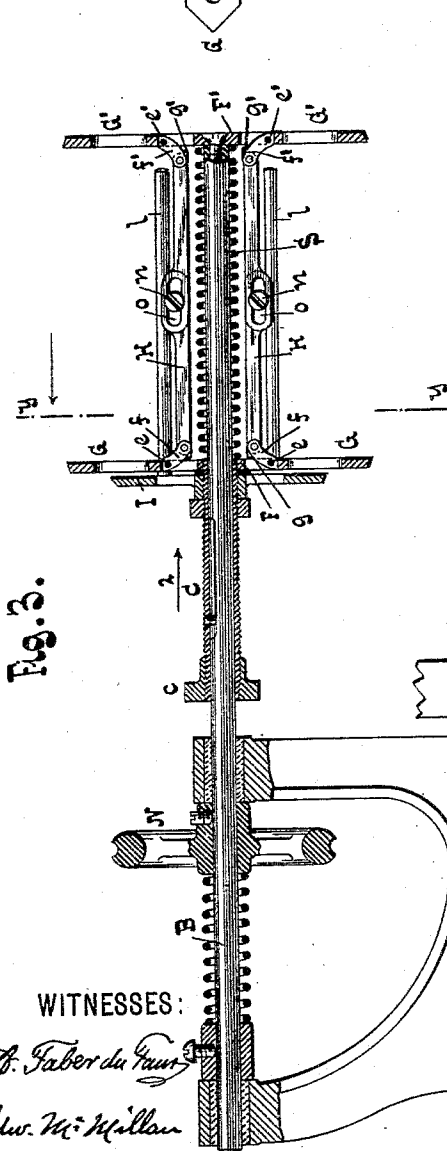
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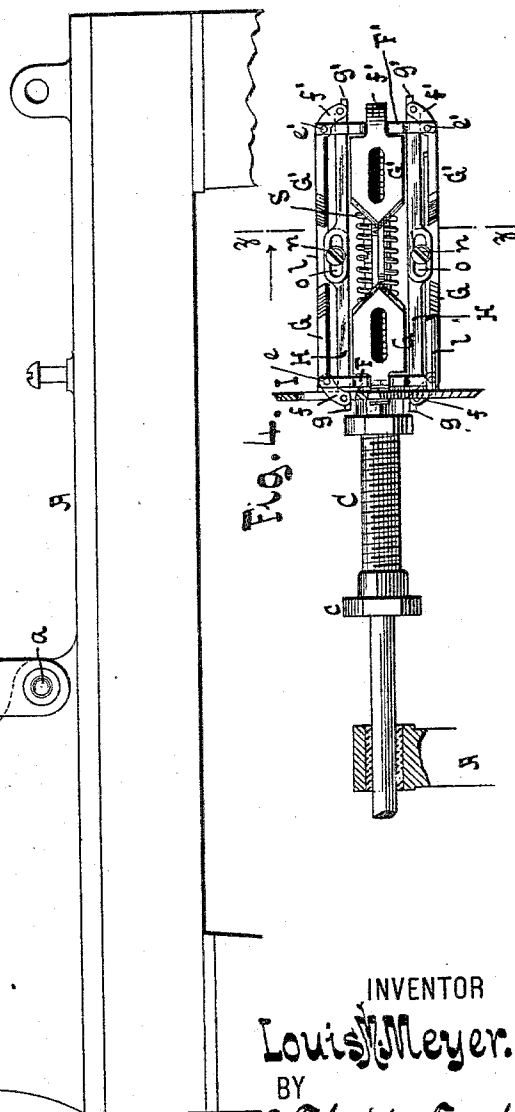
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(No Model.)

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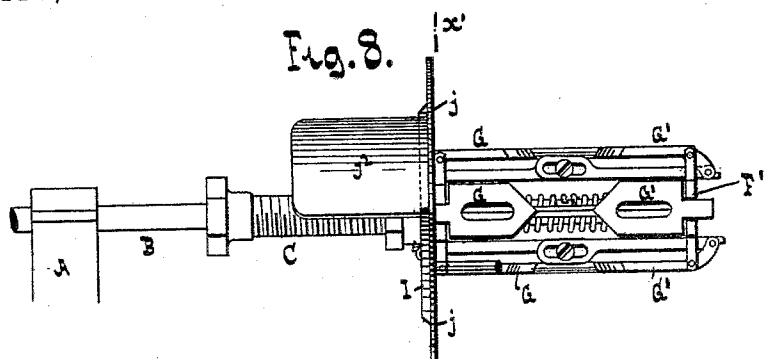
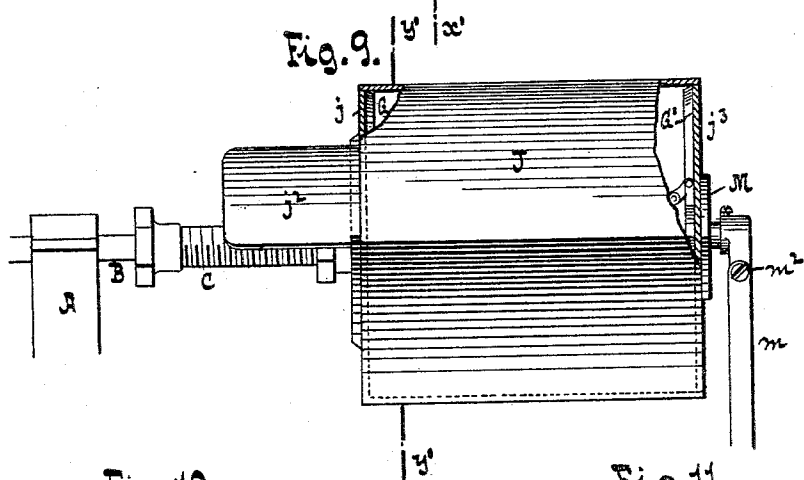


Fig. 10.

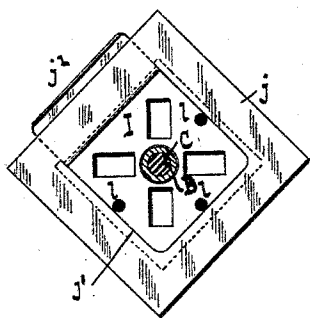


Fig. 11.

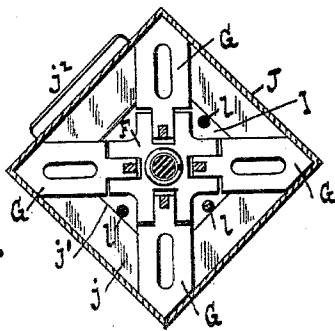
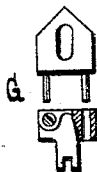


Fig. 12.



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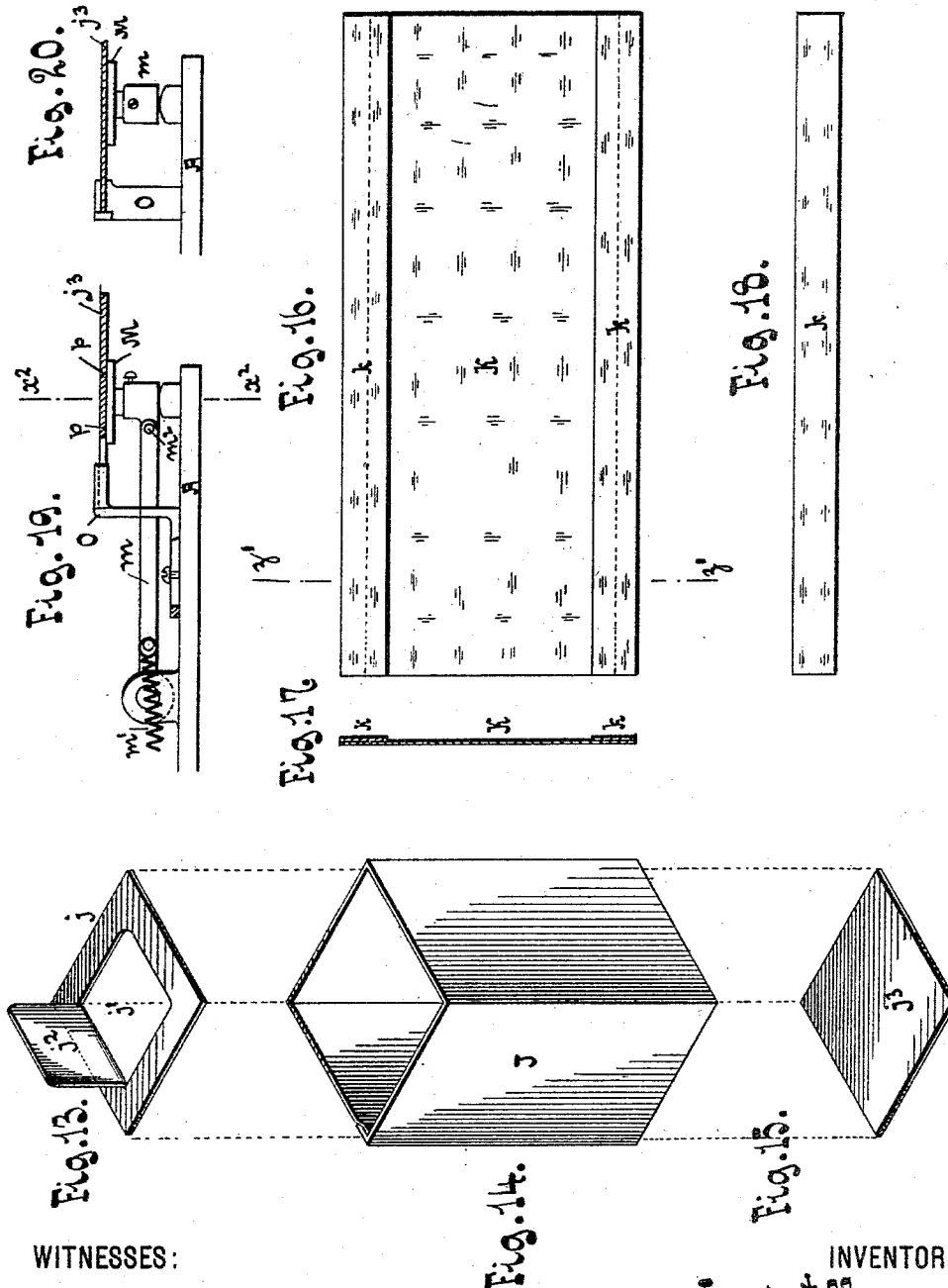
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UNITED STATES PATENT OFFICE.

LOUIS M. MEYER, OF NEW YORK, N. Y.

BOX-FINISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 414,426, dated November 5, 1889.

Application filed January 5, 1889. Serial No. 295,518. (No model.)

To all whom it may concern:

Be it known that I, LOUIS M. MEYER, a citizen of the United States, and a resident of New York, in the county and State of New York, have invented a new and useful Improvement in Box-Finishing Machines, of which the following is a specification.

My invention relates to a machine for finishing ordinary boxes, and also boxes of that class which are provided with an opening in their tops that is closed by a flap, as fully set forth in the following specification and claims, and illustrated in the accompanying drawings, in which—

Figure 1 represents an elevation of a machine embodying my invention, the form being shown expanded. Fig. 1* is an elevation of a detail part. Fig. 2 is a transverse vertical section in the plane $x x$, Fig. 1. Fig. 3 is a longitudinal vertical section of Fig. 1. Fig. 4 is an elevation of a portion of the machine, showing the form contracted. Fig. 5 is a vertical section in the plane $y y$, Fig. 3. Fig. 6 is a vertical section in the plane $z z$, Fig. 4. Fig. 7 is a face view of one of the supports of the form. Fig. 8 is an elevation of a portion of the machine, showing the top of the box placed on the form. Fig. 9 is a similar view showing the several parts of the box placed on the form and the form expanded. Fig. 10 is a vertical section in the plane $x' x'$, Fig. 8. Fig. 11 is a vertical section in the plane $y' y'$, Fig. 9. Fig. 12 shows a modified form of support. Figs. 13, 14, and 15 are perspective views, respectively, of the top, body, and bottom of a box. Fig. 16 shows the box-covering. Fig. 17 is a section in the plane $z' z'$, Fig. 16. Fig. 18 is a face view of a molding in strip. Fig. 19 illustrates the means for gaging the bottom. Fig. 20 is a vertical section in the plane $x^2 x^2$, Fig. 19.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates a suitable frame having bearings for a revoluble shaft B, which extends beyond said bearings. Upon this shaft is mounted a carrier C, which may be in the form of a cylindrical sleeve. This carrier can be moved longitudinally upon the shaft by any suitable means—such, for instance, as an arm D, Fig. 1—which is hinged at a to the frame, and is slotted at b to receive a nut or head c on the end of the carrier.

This arm is engaged in this example by a hand-lever E, having a projecting shoulder d , Fig. 1*, which is in contact with the arm. When the arm is moved to the end of its stroke in the direction of arrow 1, Fig. 1, this shoulder d falls into a notch d' in the arm and retains the same in this position, for a purpose to be hereinafter described.

At the end of the sleeve or carrier C is secured a plate F, Figs. 1, 3, and 5, to which are hinged at e a number of supports G corresponding to the corners of the box, and to the end of the shaft B is secured a similar plate F', to which are hinged at e' a number of supports G' corresponding in dimensions and number to the supports G and arranged directly opposite and in line with the same. Each of these supports G G' is provided with a tail $f f'$, the opposite tails having pivoted connections with links H.

The carrier C or the plate F is subjected to the action of a spiral spring S, which forces the same away from the plate F', thereby causing the supports G and G' to normally stand open or expanded. They are stopped when at right angles to the shaft B by stops $g g'$, Fig. 3, on the ends of the links H, which engage with the tails of the supports.

An end plate I is located on the carrier C at a distance equal about to the thickness of the paper-board from the plate F. It is provided with a recessed side h , into which recess the flap of the box falls, as will be hereinafter described.

When the supports G G' are turned about their hinges to the position shown in Fig. 4, they permit the box to be placed upon the form. The closing of the supports is effected in this example by moving the carrier C in the direction of arrow 2, Figs. 1 and 3, whereby the plate F is caused to move toward the stationary plate F', and consequently the supports are caused to turn inwardly about their hinges until finally they assume the position shown in Fig. 4—that is, approximately parallel with the shaft B.

In Figs. 13, 14, and 15, I have shown the several parts of a box, for the finishing of which this machine has been constructed, J being the body of the box, j the top thereof having an opening j' and a closing-flap j^2 , and j^3 the bottom of the box. K is the box-cover-

ing, usually made of paper, and k is the molding-in strip. When the form is contracted, as shown in Figs. 4 and 8, the top j can be slid over the same until it rests upon the end plate I, Fig. 8, the flap j^2 being first bent outward at right angles, or nearly so, to the top. The flap j^2 passes through the recessed side h of the head-plate, and the remaining portion of the end plate which surrounds the opening in the top forms a support for the same when the form is expanded. To guide the top of the box and to keep it out of contact with the wings while being placed on the form, suitable guides, as l , can be secured to the head-plate I, Figs. 1, 3, and 10. After the head has been placed in position the body J of the box is passed over the form, and is fitted over the head j , whereupon the form is permitted to expand by releasing the arm D, which permits the carrier C to assume its normal position, Figs. 1 and 9. In this position the top j of the box is held between the end plate I and the exterior of the supports G, and the body of the box is supported at each end by the supports G, which are of such a length that they gently wedge themselves into the corners of the box. The bottom j^3 of the box is now inserted and held against the exterior of the supports G' by means of a suitable holder. In the example shown in the drawings, Figs. 1 and 9, I have made use of a center plate M, which can turn in a bearing in an arm m , which is hinged to the frame of the machine and subjected to the action of a spiral spring m' . The center plate is provided with a pin-and-groove bearing, Fig. 1, so that it can turn with the box, and the arm m may be in two sections, hinged at m^2 , so that the center plate can be adjusted to the center of the box—that is, concentric with the shaft B. The several parts of the box being now firmly held together, the covering K and molding-in strip k are applied to the same. This I prefer to do by first pasting the molding-in strips to the covering, as shown in Fig. 16, and then pasting the two combined upon the box and turning over the end of the covering and the strips to mold in the bottom and top of the box. If desired, however, the molding-in strips could be first applied and then the covering, which is the usual method.

During the operation of covering the box the form can be slowly turned either by a direct action on the box or by slowly turning the shaft by a suitable pulley or a belt-connection, or by other suitable means. After the side covering has been applied the bottom covering is pasted on while the box is still in the form.

In the drawings I have shown a box which is square in cross-section; consequently the supports G and G' are of such dimensions and shape as to form when open a perfect square. However, it is very evident that they could be removed and replaced by supports having such dimensions as to form a parallelogram for boxes having a rectangular

cross-section. For circular boxes the ends of the supports would be rounded. By increasing the number of supports boxes having a polygonal cross-section of five or more sides could be held on the form.

In order to adjust the form for any particular depth of box, the links H, connecting the supports, are made sectional and united by any adjustable connection—such, for instance, as a pin n and slot o , or by a right-and-left-hand nut.

In the example illustrated in the drawings the carrier C is provided with an external screw-thread, so that the positions of the plate F and the end plate I can be changed.

For different diameters of boxes the wings G and G' can be replaced by proper supports to fit the particular size of box, or they can be made in two parts and adjustable, as shown in Fig. 12.

In the previous description of the method of placing several parts of the box on the form it was stated that the bottom was placed in by hand and the holder then snapped upon it. However, if desired, the center plate M could be provided with spurs or pins p , Figs. 19 and 20, for holding the bottom, which can be placed in a proper position thereon by the use of gages, as O, on the frame of the machine. The form could be rotated to a proper position by means of a suitable index, Fig. 1—for instance, a spring-plate q , having a nib r , which snaps into a small depression on the shaft. By swinging the center upward the bottom of the box would be inserted in the box and held thereon in one operation.

When ordinary boxes—that is to say, such as have no top—are to be covered, the end plate I is not necessary.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a box-finishing machine, an expandible form consisting of hinged supports arranged opposite each other and constructed to turn about their hinges for admitting and supporting the box, substantially as described.

2. In a box-finishing machine, an expandible form consisting of sets of interior supports arranged opposite each other and constructed to contract and expand for admitting and supporting the box, and a holder for securing the bottom of the box, substantially as described.

3. An expandible form for boxes, consisting of sets of hinged supports arranged opposite each other, and connections between said hinged supports whereby the longitudinal movement of one set of supports actuates both sets of supports to turn about their hinges, substantially as described.

4. An expandible form for boxes, consisting of a shaft, a set of hinged supports secured to the end of the same, a carrier movable longitudinally on said shaft, an end plate, a set of hinged supports secured to the carrier, link-connections between the opposite hinges of the supports, and means for imparting a

longitudinal movement to the carrier, substantially as described.

5 The combination, with a shaft, of a set of hinged supports secured to the end of the same, a carrier movable longitudinally on said shaft, a recessed end plate, a set of hinged supports secured to the carrier, link-connections between opposite supports, longitudinal guides secured to the end plate, and a holder,
10 substantially as described.

6. An expansible form for boxes, consisting of sets of supports arranged opposite each other and constructed to expand and contract for admitting and supporting the box, and
15 adjustable connections between the supports for adapting the form for any particular depth of box, substantially as described.

7. An expansible form for boxes, consisting of sets of radially-adjustable supports arranged opposite each other and constructed to expand and contract for admitting and supporting the box, substantially as described.
20

8. In a box-finishing machine, the combination of a form and a swinging center
25 plate having its supporting-arm sectional and

hinged together, whereby said center plate can be adjusted with respect to the center of rotation of the form, substantially as described.

9. An expansible form for boxes, consisting of sets of hinged supports arranged opposite each other, one of said sets being movable longitudinally, link-connections between said hinged supports, and a spring acting on the movable set of supports, substantially as described.
30 35

10. In a box-finishing machine, an expansible form consisting of an end plate and sets of interior supports arranged opposite each other and constructed to contract and expand
40 for admitting and supporting the box.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 27th day of December, 1888.

LOUIS M. MEYER.

Witnesses:

A. FABER DU FAUR, Jr.,
CHAS. S. HAYES.