April 27, 1926. 1,582,205

D. WRIGLEY

PAPER BOX MAKING MACHINERY

Filed July 24, 1924

Fig. 1.

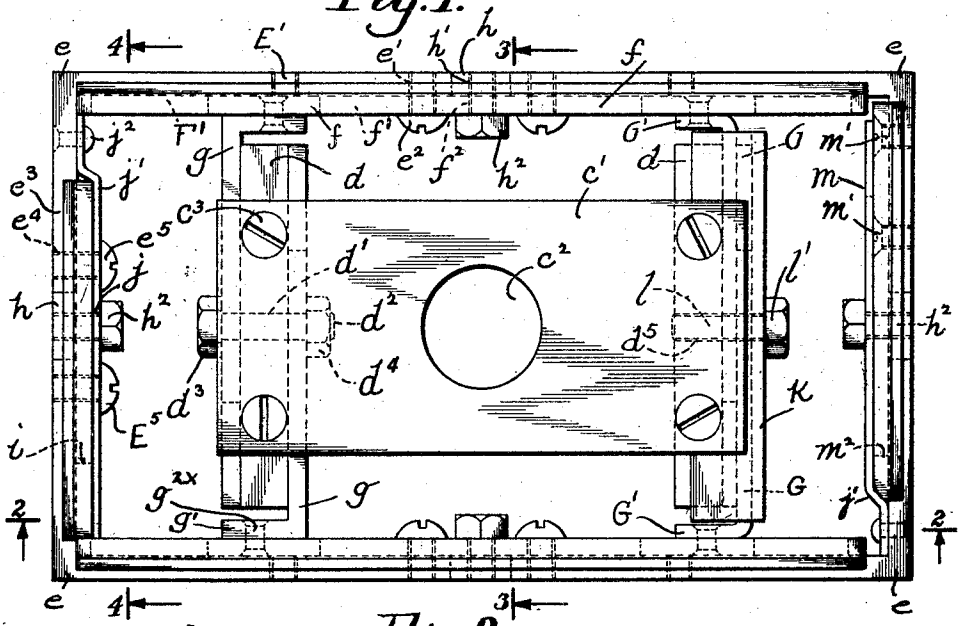


Fig. 2.

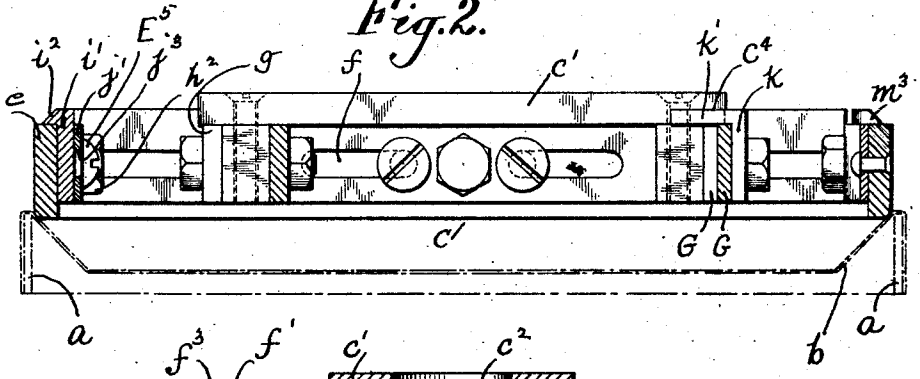


Fig. 3.

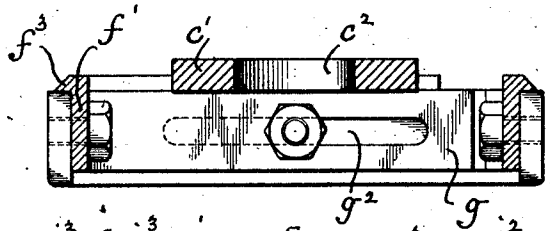
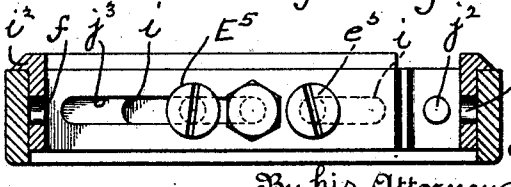


Fig. 4.



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UNITED STATES PATENT OFFICE.

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PAPER-BOX-MAKING MACHINERY.

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To all whom it may concern:

Be it known that I, DANIEL WRIGLEY, a citizen of the United States, residing in the borough of Brooklyn of the city of New York, in the State of New York, have invented certain new and useful Improvements in Paper-Box-Making Machinery, of which the following is a specification, reference being had to the accompanying drawing, forming a part hereof.

This invention relates to adjustable forms particularly applicable in the manufacture of paper boxes and has especial reference to those forms which are used to apply the paper covering to the interior surfaces of the rough pasteboard box to present a pleasing and finished appearance thereto. In the manufacture of paper boxes the rough pasteboard box is first placed upon the paper from which the outer covering is to be made and which has previously been coated upon one side thereof with paste glue or the like and the box with the paper covering secured by the paste to its bottom surface is pushed up onto a form known to the trade as a "turn-in" which fits snugly within the box and which has suspended below it within the box a member called the "middle". The box, "turn-in" and "middle", in assembled relation, are then moved downwardly to rest upon a yieldingly supported base or "underform". Rollers thereafter press the paper upwardly against the sides of the box which are supported to resist such pressure by the "turn-in". The "turn-in" is next moved upwardly out of the box and suitable blades turn the paper over the top edges of the box to be engaged by the "turn-in" upon subsequent downward movement thereof to press the paper against the inner sides of the box to which it is affixed by the paste. Heretofore such a "turn-in" has been incapable of adjustment and the innumerable sizes of boxes supplied to the trade for great varieties of purposes necessitated the provision of great numbers of forms which varied sometimes by only fractions of an inch and each time a box of a new size or for a new purpose was required considerable expense and delay was occasioned by the time required to manufacture a new form to fit the new size of box. It is an object of the present invention to provide a form for the purpose described which shall be adjustable in size whereby the same form may be used in the making of a great many different sizes of paper boxes. In general the invention comprises a supporting plate adapted to be secured in the usual manner to an element of the machine and bearing form elements which are adapted to have their relative positions varied with respect to each other and to the plate whereby the size of the form is altered, means being provided to continue the outer marginal surfaces of the form between the form elements when in spaced relation.

More particularly the plate supports an interior frame which is itself adjustable in size in one dimension and which carries the form elements constituting the outer marginal surfaces of the "turn-in". These form elements are movable with respect to the frame for alteration of the size of the "turn-in" in a second dimension and are adjustably interconnected in some instances to further the rigid retention thereof in predetermined position while, between the form elements, the outer marginal surface of the "turn-in" is continued by interchangeable filling-in pieces removably secured to the frame. The invention will be best understood from the following detailed description of the accompanying drawings illustrating preferred embodiments thereof and in which:

Figure 1 is a plan view showing a "turn-in" and modification of the means for changing its size in two dimensions.

Figure 2 is a vertical sectional view taken in the plane indicated by the line 2—2 in Figure 1 and looking in the direction of the arrows and showing the use of the "turn-in" in the operation of deflecting and pressing the paper cover to the inner surface of the walls of a box.

Figure 3 is a vertical transverse sectional view taken in the plane indicated by the line 3—3 in Figure 1 and looking in the direction of the arrows.

Figure 4 is a vertical transverse sectional view taken in the plane indicated by the line 4—4 in Figure 1 and looking in the direction of the arrows.

Referring to Figure 2 of the drawings the upper extremities of the walls of a paper box are indicated at *a* and a paper covering which has already been applied to the outer surfaces of the walls *a* and turned inwardly over the upper edges thereof is indicated at *b*. The "turn-in" indicated as a whole at *c* is provided, as is usual, with a plate *c'* formed with an aperture c^2 there-

in for engagement by an element of the machine used to manufacture the paper box as is usual in connection with the "turn-in" now in use. No element of the machine is illustrated as it forms no part of the present invention, the form according to the present invention being applicable with any of the known types of machines. Secured to the plate c' as by screws c^3 are the transverse frame elements or bars d. Only two such transverse elements are illustrated in the drawings but it will be apparent that any number of such elements may be used dependent upon the size of the "turn-in", it being evident that from manufacturing considerations a more rugged construction will be desirable for "turn-ins" used in the manufacture of boxes of the size of hat boxes, for instance, than will be desirable in "turn-ins" used in relatively smaller boxes such as candy boxes, for instance, while the same considerations enter into the construction of adjustable forms used in the manufacture of still smaller boxes such as pill boxes, for instance. The paper engaging elements proper of the form are supported upon what may be termed an interior frame which includes the transverse supporting members or bars d and longitudinally extending side frame members f. These form elements proper comprise L-shaped members or corner pieces e which are provided in the longer leg of the L with holes e', E' to be engaged by screws e^2 movable in slots formed in longitudinal side frame members f. The side members are provided with a plurality of the slots f', F', each of which corresponds with one of the holes e', for a purpose which will hereinafter appear. One modification of the means for adjusting the size of the "turn-in" has been illustrated in the left of Figure 1 while another modified construction is shown at the right of that figure.

Reference will first be had to the construction disclosed at the left of Figure 1. Between the slots f' and F' the side frame members f are secured respectively to the turned over ends g' of transverse slides g as by means of rivets $g^{2\times}$. Each of the slides g is provided with a longitudinally extending slot g^2 and the slides secured to the respective side frame members are disposed upon opposite sides of the transverse element d which is provided centrally thereof with a hole d' through which a bolt d^2 passes to engage by means of its head d^3 and nut d^4 the outer marginal surfaces of the respective slides g. By loosening up on the nut d^4 the two slides g may be drawn in opposite directions with respect to the transverse element d, the slots g^2 permitting such transverse movement, and after the desired width of the form is obtained the nut may be tightened to rigidly maintain the form at the desired width. It will be apparent that when the corner member e is at its extreme inner position the screw e^2 is at the inner end of one slot f but that when the corner e is moved towards its extended position with respect to the longitudinal side member f the said hole e' will move out of register with the slot opposite that portion of the side frame member to which the slide g is secured. In consequence a second hole E' is provided which in this situation will be in register with the second slot F' for the reception of the screw e^2, the screw sliding then in the slot F'. It will be apparent that a single slot cannot be provided for the reception of the screw in view of the fact that a certain portion of the wall is necessary for connection with the slide g. Between the inner ends of the corners e there will naturally be a space dependent upon the overall length of the form and it is proposed to provide a spacing member, which may be termed a filling-in piece, h of the same transverse diameter as the arms of the L's e whereby a continuous outer surface of the "turn-in" is afforded. A hole h' is provided centrally of the member h and a co-operating hole f^2 is also formed in the longitudinal element f so that a screw h^2 carried in the hole f^2 may engage the hole h' and rigidly secure the elements h, f in assembled relation. As the L's e move away from each other, of course, the space between their inner ends will vary and therefore it is proposed to provide a plurality of filling-in pieces h of different lengths in order to close the gaps between the end of the L's in their various positions of adjustment. The other leg e^3 of the L is also provided with a threaded hole e^4 for the reception of a screw e^5 slidable in one of a pair of slots i in a spacing member i', each of the slots of the pair being designed to receive one of the screws (e^5 and E^5 respectively) threaded into the respective legs e^3 of the corners. Between the legs e^3 are also provided suitable spacing elements h in the same manner as hereinbefore described in connection with the sides of the form, the screws h^2 in this instance passing through an appropriate aperture j in a guide j' extending transversely of the form throughout approximately the entire width thereof and secured in any convenient manner to one of the L's as by the rivet j^2. The guide j is formed at its outer end with a slot j^3 to permit unimpeded sliding movement of one of the screws, say E^5.

To adjust the form in a longitudinal direction it is merely necessary to loosen the screws e^2 and draw the ends of the form outwardly to the desired length, the screws sliding in the slots f. Thereafter the screws may be tightened to rigidly maintain the

form in the desired size. A spacing element h of the proper length to fit between the L e is then introduced therebetween and fastened in place by the screw h^2 increasing the length of the form to its more extended positions. The screws e^2 may be removed from the holes e' and inserted in the holes E' through the slots F'. To alter the width of the form the nut d^4 is loosened on the bolt d^2 and the screws e^5, E^5 are loosened whereafter the sides may be drawn outwardly to conform to the desired width, the screws e^5, E^5 sliding in the respective slots i and j^3. When the desired width of the form is obtained the screws e^5, E^5 may be tightened as well as the nut on the bolt d^2 whereafter a proper spacer member h may be inserted and secured therein by the screw h^2 as a manner hereinbefore described.

In order to maintain the various component elements of the form in rigid relation and to serve as a guide during the adjustment of the same the upper edge of the longitudinal side members f' and the transverse guiding elements i' are turned over to form what may be called the toes f^3 and i^3, respectively which engage the upper edge of the legs of the corners in a manner which will be clearly apparent upon inspection of the drawings.

The modified means for permitting variations in the size of the "turn-in" as illustrated at the right hand side of Figures 1 and 2 embodies the same principle of operation as that previously described, but involves a rearrangement of parts tending toward simplification in construction and manipulation. The slides G, G, are, as before, turned over at one end as at G' and are secured at opposite ends respectively to the side frame members f between the slots f' and F'. In contradistinction to the construction previously described, however, these slides are disposed adjacent one another upon the same size of the transverse frame member d and are maintained in sliding relation therewith by a guide k of inverted L-shape in cross section, the horizontal leg k' of the L extending over the top of the slides and transverse frame member to seat in a cut out portion c^4 of the plate and be rigidly clamped therein by the screws c^3. The guide k not only serves to guide the slides G in a transverse direction but the leg k' serves to prevent angular displacement of the slides with respect to each other. The slides G are provided with slots (not shown) as before through which passes a screw l threaded into a hole d^5 in the transverse member d and serving not only to limit the extension of the slides through the instrumentality of the slots but also by means of the head l' securing the guide, slides and transverse frame member together in the desired relation. Still referring to the modified construction illustrated at the right of Figures 1 and 2 it will be observed that a guide m is secured by means of the screws m' to the transverse leg of one of the corner pieces c and overlies for a considerable distance the proximate leg of the adjacent corner piece. The guide is slotted as at m^2 for sliding engagement with the screw h^2 and is formed with a toe m^3 to ensure rectilinear movement of the respective legs of the corner pieces. A co-operating guide j' similar to that illustrated at the left-hand side of Figures 1 and 2 is secured as before to the leg of the second corner piece to overlie the guide m and slide with respect thereto, when the width of the form is varied, by means of the slot j^3 formed therein, the screw h^2 serving to secure the parts in the desired relation.

It will be apparent that the construction last described is somewhat simpler of manipulation than the construction first discussed since only two screws l' and h^2 need be manipulated in order to effect a change in the width of the form.

It will thus be seen that a simple and effective form has been provided which is adjustable within prescribed limits whereby the necessity of providing a plurality of separate unadjustable forms is obviated and considerable time, expense and labor is saved.

While the invention has been illustrated as applied to what is known in the art as a "turn-in" for use in connection with the manufacture of paper boxes it is not to be limited to such but is equally applicable in many other situations in which adjustable forms are required. Various modifications may be made in the disposition and form of the co-operating elements and no limitation is intended by the terminology and phraseology used in the foregoing description but reference will be had to the appended claims for an indication of the scope of the invention.

What I claim is:

1. In combination a supporting plate, an interior frame comprising a pair of spaced transverse members secured to the plate, a pair of side members and pairs of relatively movable members secured respectively at their ends to the side members and secured in sliding relation to the spaced transverse members respectively, corner pieces, means to adjust the relative positions of the corner pieces with respect to the side frame members, transverse means to retain said corner pieces in predetermined positions, filling-in pieces, and means to secure said filling-in pieces to the side members.

2. In combination, a supporting plate, an interior frame comprising a pair of spaced transverse members secured to the plate a pair of side members and pairs of relatively movable members secured respectively at

their ends to the side members and secured in sliding relation to the spaced transverse members respectively, corner pieces, means to adjust the relative positions of the corner pieces with respect to the side frame members, transverse means to retain said corner pieces in predetermined positions, filling-in pieces, means to secure said filling-in pieces to the side members, and means to secure said corner pieces against displacement.

3. In combination, a supporting plate, an interior frame comprising a pair of spaced transverse members secured to the plate, a pair of side members and pairs of relatively movable members secured respectively at their ends to the side members and secured in sliding relation to the spaced transverse members respectively, corner pieces, means to adjust the relative positions of the corner pieces with respect to the side frame members, transverse means to retain said corner pieces in predetermined positions, filling-in pieces, means to secure said filling-in pieces to the side frame members, and means to secure said corner pieces and filling-in pieces against displacement.

4. In combination, a plate formed with cut-out portions in its lower surface, transverse supporting bars secured to the plate within the cut-out portions respectively, an interior frame comprising slotted sides, slotted slides secured respectively to the sides between the slots and disposed adjacent one another and the supporting bars, a guide L-shaped in cross section disposed adjacent one of the slides with one side overlying the upper surfaces of the slides and entering the cut-out portion, a screw passing through the guide, the slots in the respective slides and threaded into a hole in the bar, form members adjacent the slotted sides, screws passing through the slots in the sides and engaging the form members and filling-in pieces, and means to secure said filling-in pieces between the form members.

5. In combination, a plate formed with cut-out portions in its lower surface, transverse supporting bars secured to the plate within the cut-out portions respectively, an interior frame comprising slotted sides, slotted slides secured respectively to the sides between the slots and disposed adjacent one another and the supporting bars, a guide L-shaped in cross section disposed adjacent one of the slides and entering the cut-out portion, a screw passing through the guide, the slots in the respective slides and threaded into a hole in the bar, form members adjacent the slotted sides, extensible members to retain said corner devices in predetermined positions, screws passing through the slots in the sides and engaging the form members and filling-in pieces, and means to secure said filling-in pieces between the form members.

This specification signed this 28th day of June, A. D., 1924.

DANIEL WRIGLEY.