H. G. SCHMIDT.

BOX MACHINE.

APPLICATION FILED SEPT. 27, 1909.

987,748. Patented Mar. 28, 1911.

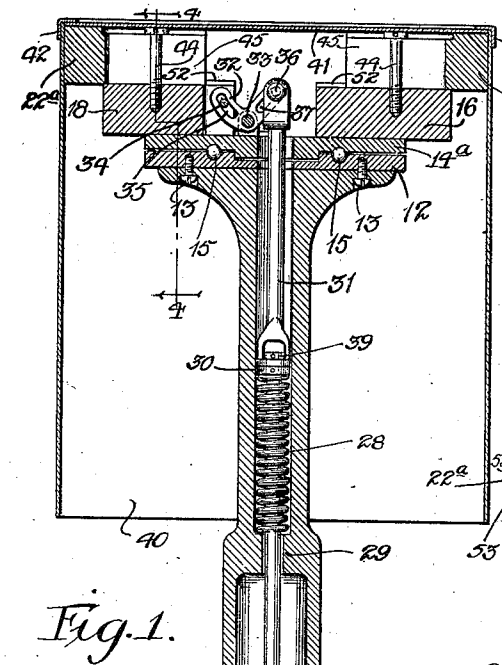

Fig. 1.

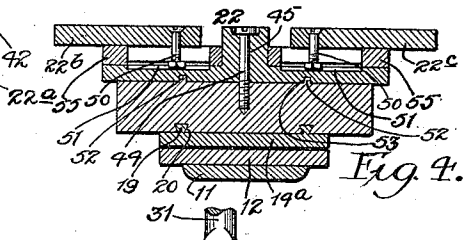

Fig. 4.

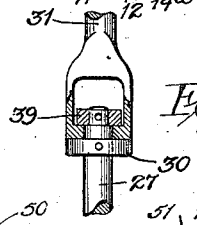

Fig. 6.

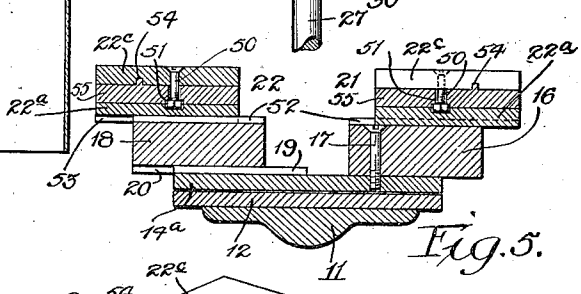

Fig. 5.

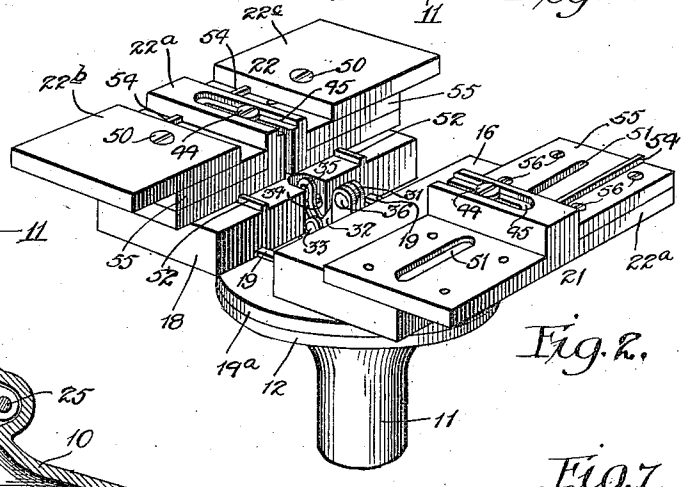

Fig. 2.

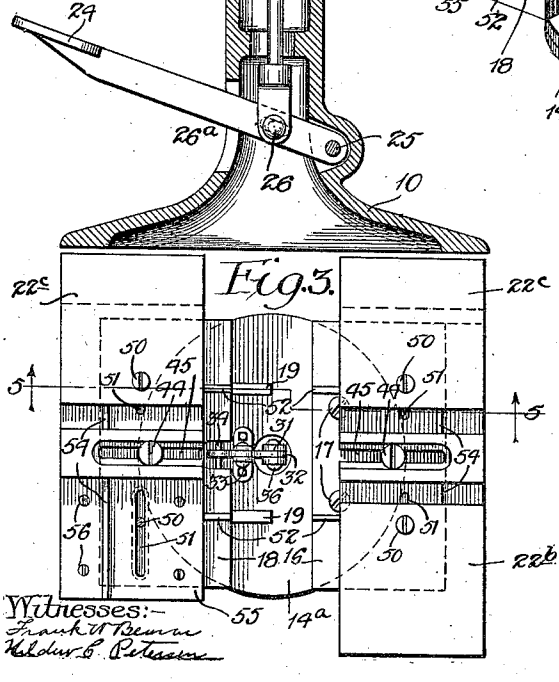

Fig. 3.

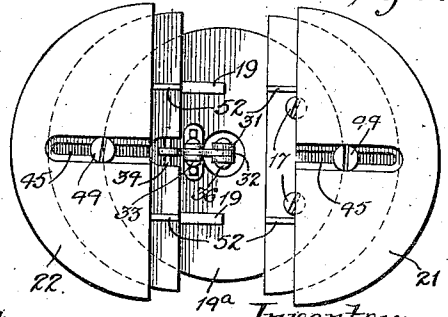

Fig. 7.

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BOX-MACHINE.

987,748. Specification of Letters Patent. Patented Mar. 28, 1911.

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To all whom it may concern:

Be it known that I, HENRY G. SCHMIDT, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Box-Machines, of which the following is a full, clear, and exact description.

The invention relates to machines for making paper boxes or the like.

In forming paper boxes, particularly large sizes, it is now common practice to first secure stock together to form the body or sides of the box and then to secure a bottom to the sides by pasting a binding strip around the meeting-edges or corners between the bottom, to form the box. In practice, the boxes to be formed frequently vary in size and in securing the bottom in the box-body, it is necessary for the operator to use both hands in manipulating the strip for securing the parts together. Furthermore, in this operation it is desirable that the parts, usually formed of paper, cardboard or the like, should be supported in proper relation so that the box will be properly shaped when the bottom has been secured in the body.

The invention designs to provide an improved machine, whereby the box-body and bottom may be accurately held in proper position to be secured together to facilitate the operation of securing the bottom in the body by providing an expansible internal form for the box-body and a treadle for operating the form to release the box, so that both hands of the operator may be used to manipulate the parts of the box in the securing operation. By providing an expansible internal form for the box-body, the latter will be held by the machine, the bottom-blank may be laid on the form in correct relation in or to the box-body, so that both of these parts will be held by the form in convenient position to be secured together by a binding strip, the operation is markedly facilitated because the operator can, when both hands are free, work faster in applying the binding strip and secure the box-bottom and sides together, the form being revolubly sustained to further facilitate the work of the operator. When the bottom has been secured to the body of the box, the treadle may be conveniently operated to release the box, so that the latter may be quickly removed. Furthermore, by providing an internal form for holding the box-body, the box, when completed, will be truly formed.

The invention further designs to provide an improved machine of this character, which is adapted for the manufacture of boxes of different sizes and shapes.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claim at the conclusion hereof.

In the drawings: Figure 1 is a central vertical section of a machine embodying the invention. Fig. 2 is a perspective of the expansible form, parts being removed. Fig. 3 is a plan. Fig. 4 is a section on line 4—4 of Fig. 1. Fig. 5 is a section on line 5—5 of Fig. 3. Fig. 6 is a detail of the swivel-coupling for the rod-sections whereby the treadle is connected to the revoluble form-head. Fig. 7 is a plan of a modified form of the invention, showing a differently shaped expansible form.

The machine comprises a support consisting of a base 10 adapted to rest on a floor, a hollow standard 11 and a table or bed 12 secured to the upper end of the standard by screws 13. A head adapted to carry the internal form for holding a box, is revolubly mounted on the support by means of a ball-bearing 15, so that the head and form may be rotated horizontally, the supporting structure being stationary. The head on which the internal form is mounted comprises a bearing-plate 14^a, a section 16, which is rigidly secured to the plate 14^a by screws 17 and a section 18, which is slidably mounted on the table, by dove-tail ribs 19 secured on plate 14^a and fitting into corresponding grooves 20 formed in section 18. The expansible form for internally holding the box-body consists of a section 21, fixedly and adjustably mounted on head-section 16 and an oppositely disposed section 22 mounted on the slidable head-section 18. The outer edges of these form-sections correspond to the shape of the box and when expanded they are adapted to fit snugly against and engage the inside of the box-body and when contracted by sliding section 18 inwardly to bring the form-sections into closer relation, they will release the body, so that the latter, after the bottom has been secured thereto, may be conveniently removed from the form.

The mechanism for expanding and contracting the form to secure or release the

box-body is operable by a treadle, so that it may be conveniently done without requiring operation by either hand of the operator and so that the work of securing the box to the body may be facilitated and to facilitate the removal of the box-body and to permit both hands to be used in placing a box-body around the form and into position to receive the bottom-blank. The mechanism for contracting the form comprises a treadle 24, which has its inner end pivotally mounted in the supporting structure, as at 25, and is connected by a pin 26 and slot 26[a] to the lower end of a rod 27, which is guided in the hollow supporting standard 11 and is normally held in raised position by a spring 28, which rests on a shoulder 29 in the standard 11 and engages a collar 30, secured near the upper end of rod 27. The upper end of said rod is connected, by means of a rod-section 31 to operate a bell-crank lever 32, which is pivotally sustained, as at 33 on the plate 14[a] of the revoluble head. One arm of the bell-crank lever is operatively connected to head-section 18 by a pin 34 in said connection, which extends through a slot 35 in said arm and the other arm of the bell-crank lever is connected by a pin 36, which extends through a slot 37 in said lever, to the upper end of rod-section 31. Resultantly, when treadle 24 is depressed, rod-sections 27, 31 will be pulled downwardly against the force of spring 28 to cause the bell-crank lever 32 to swing about its pivot 33 and cause head-section 18 and the form-section carried thereby to be moved inwardly. When the treadle 24 is released, spring 28 will lift the treadle, rod-sections 27, 31 and swing bell-crank 32 to force head-section 18 and the form carried thereby, outwardly. In order to permit plunger 31 to rotate with the head-form, without requiring rotation of the treadle and spring, the lower end of rod-section 31 is bifurcated and is held between collar 30 and a collar 39 secured to rod 27, the lower end of the rod-section 31 being confined between collars 30 and 39, so that the plunger may rotate without the rod 27, but will move vertically with it. This construction forms a swivel-connection in the connection between the treadle and lever 32. Resultantly, the form with the box-body thereon may be conveniently rotated to facilitate the work in securing the bottom in the box.

In operation, the operator will first depress the treadle 24 and then place the box-body 40 around the form so that the upper edge thereof will be disposed adjacent the upper face of the contractible form and when the box-body has been thus placed, treadle 24 will be released whereupon spring 28 will press head-section 18 and form-section 22 outwardly, causing the form to be expanded, so it will firmly engage and hold the box-body in assigned relation on and around the form. The bottom-blank 41 will then be laid on top of the form and be held thereby in proper relation to the body. Next, a binding-strip of other suitable material 42 will be applied to and secured around the corners between the bottom-blank and the box-body and the application of this strip will be facilitated by rotating the box-body, the form and head being rotatable on the support. When the box has been completed, by securing the sides, body and bottom together, the operator will depress lever 24 to contract the form which holds the box and then the box can be quickly removed from the form and replaced by a box-body in readiness for another operation.

The machine is adapted for the manufacture of boxes, which vary considerable in size and shape and for this purpose the form-sections are adjustably and removably mounted on the revoluble head by screws. In order to cause the form when expanded to engage the box-body firmly, but without excessive pressure, and to permit the form-sections to be adjusted the necessary distance apart for boxes of different lengths, each form-section is secured to its head-section by a screw 44 extending through a slot 45, the head of the screw being counter-sunk so that it will not project above the upper face of the form, and leave the latter clear to support a bottom-blank. Ribs 52 on the head-sections fitting in grooves 53 in the form-sections 22 guide the sections outwardly in adjusting them. The form shown in Figs. 1 to 6 of the drawings is adapted for a rectangular box and the form illustrated in Fig. 7 is adapted for an oval box. In making round boxes of different shapes, forms of different and suitable sizes are employed. In making square boxes, an adjustable form may be used to adapt the form for boxes of different sizes or shapes and in this adjustable box-form, each section comprises a central member 22[a], which is secured to its head-section by a screw 44 and slot 45, as already described and corner-members 22[b] and 22[c], which are adjustably mounted on member 22[a]. Each corner-member is secured to one of the members 22[a] by a screw 50 extending through a slot 51 in member 22[a], so that the corner-member may be spread apart or brought into closer relation to fit in box-bodies of different widths. By adjusting members 22[a] on the head-sections, the form may be adapted for box-bodies of different length. Each corner-member is guided for lateral adjustment by a groove fitting a rib 54 on member 22[a]. For convenience in construction in providing the central members 22[a] with slots, each of said members is built up by a block 55 secured thereto by screws 56. Resultantly, this adjustable form may be readily adapted for

use in making rectangular boxes of different sizes.

The invention provides a simple machine, which materially facilitates the manufacture of boxes, in that it is merely necessary for the operator to secure the box-body on the form, then lay the bottom-blank on the form and then both will be conveniently held so as to leave both hands of the operator free to quickly apply the binding strip.

The invention is not to be understood as restricted to the details shown and described, since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a box-machine, the combination of a support, a head revolubly mounted on the support, an internal box-form for holding a box-body comprising a section fixedly held on the head and a slidable section, each section having a member adjustably secured thereto, mechanism for sliding the latter section independently of the fixedly held section inwardly to contract the form, a lever for operating said mechanism, and means for pressing the slidable section outwardly to engage the box-body.

2. In a box-machine, the combination of a support, a head revolubly mounted on the support, an internal box-form for holding a box-body comprising a section fixedly held on the head and a slidable section, mechanism for sliding the latter section inwardly to contract the form comprising a bell-crank lever, a treadle for operating said mechanism, a connection between the bell-crank lever and the treadle, and means for pressing the slidable section outwardly to engage the box-body.

3. In a box-machine, the combination of a support comprising a stationary hollow standard, a head revolubly mounted on the standard, an internal box-form for holding a box-body comprising a section fixedly held on the head and a slidable section, mechanism for sliding the latter section inwardly to contract the form comprising a bell-crank lever, a treadle, a connection in the standard and between the treadle and said lever, and means for pressing the slidable section outwardly to engage the box-body.

4. In a box-machine, the combination of a support comprising a stationary hollow standard, a head revolubly mounted on the standard, an internal box-form for holding a box-body comprising a section fixedly held on the head and a slidable section, mechanism for sliding the latter section inwardly to contract the form comprising a bell-crank lever, a treadle, a connection in the standard and between the treadle and said lever, and a spring for pressing the slidable section outwardly to engage the box-body.

5. In a box-machine, the combination of a support comprising a stationary hollow standard, a head revolubly mounted on the standard, an internal box-form for holding a box-body comprising a section fixedly held on the head and a slidable section, mechanism for sliding the latter section inwardly to contract the form comprising a bell-crank lever, a treadle, a rod-connection between the treadle and said lever and a spring around said rod for pressing the slidable section outwardly to engage the box-body.

6. In a box-machine, the combination of a support, a head rotatably mounted on the support, an internal contractible box-form for holding a box-body, comprising sections each adjustably mounted on the head so that they may be spread apart, each member being laterally adjustable on its section independently of the adjustment of the section, and mechanism for contracting the form.

7. In a box-machine, the combination of a support, a head rotatably mounted on the support, an internal contractible box-form for holding a box-body, comprising sections, each adjustably mounted on the head so that they may be spread apart, each member being laterally adjustable on its section independently of the adjustment of the section, mechanism for contracting the form, a treadle, a connection between the treadle and said mechanism, extending outwardly from the form, and means for pressing the sections apart to hold the box-body.

8. In a box-machine, the combination of a stationary support comprising a hollow-standard, a revoluble head mounted on the standard and comprising a slidable section, an internal box-form comprising a section adjustably secured to the head, and a section adjustably secured to the slidable head-section, mechanism for shifting the slidable head-section inwardly, comprising a bell-crank lever mounted on the revoluble head and a rod in the hollow standard, a treadle pivoted on the support, and a spring applied to operate said mechanism to shift the slidable form-section outwardly to hold a box-body.

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