

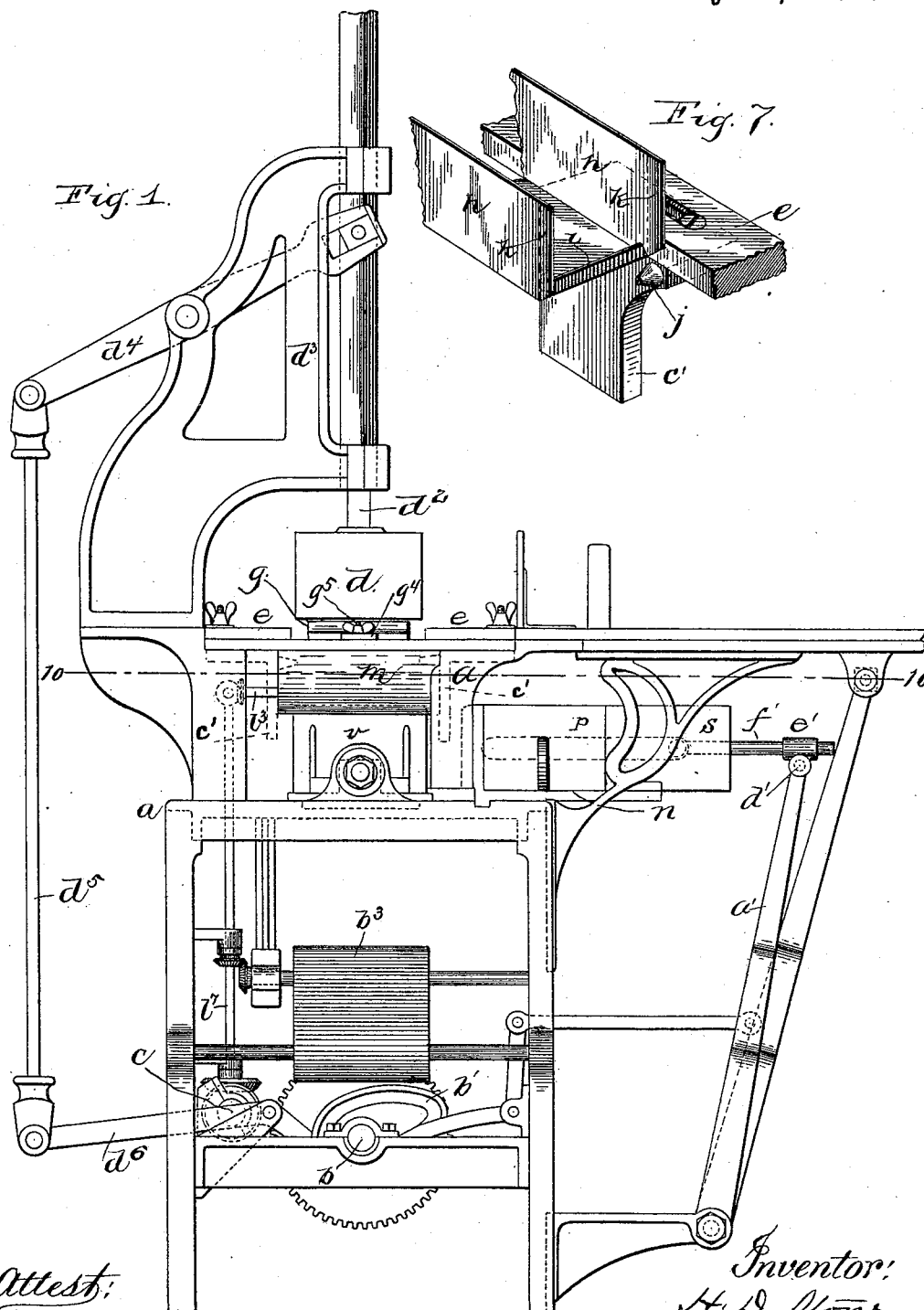
(No Model.)

5 Sheets—Sheet 1.

H. D. STONE.  
PAPER BOX MAKING MACHINE.

No. 523,295.

Patented July 17, 1894.



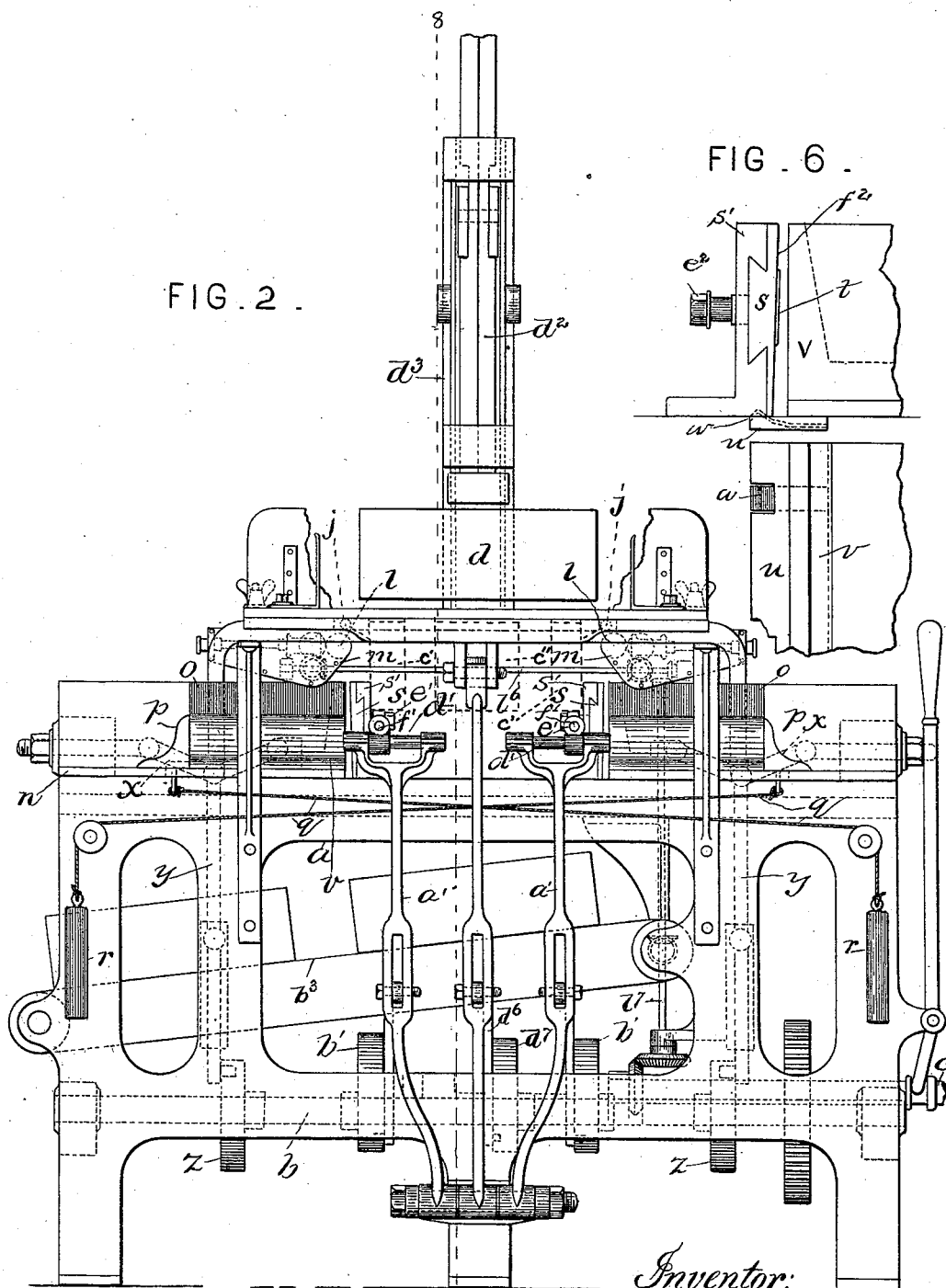
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H. & Brown.

Inventor:  
H. D. Stone  
by  
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Attys

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K. E. Brown

Inventor:  
H. D. Stone.  
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Attorneys

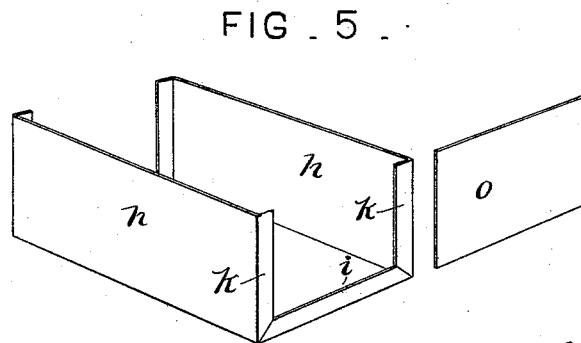
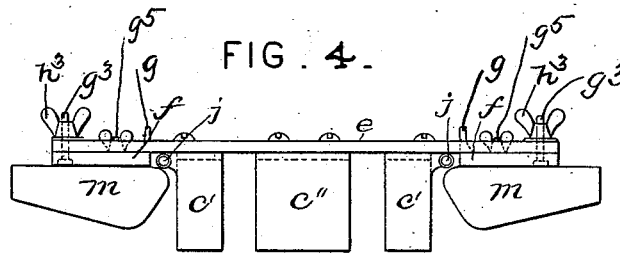
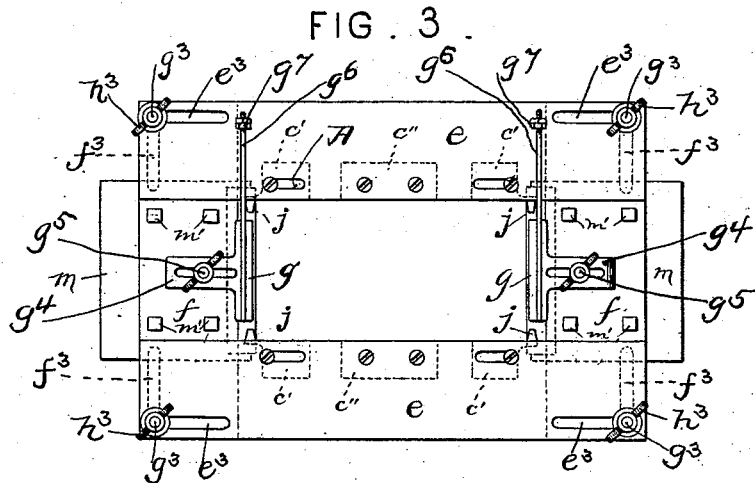
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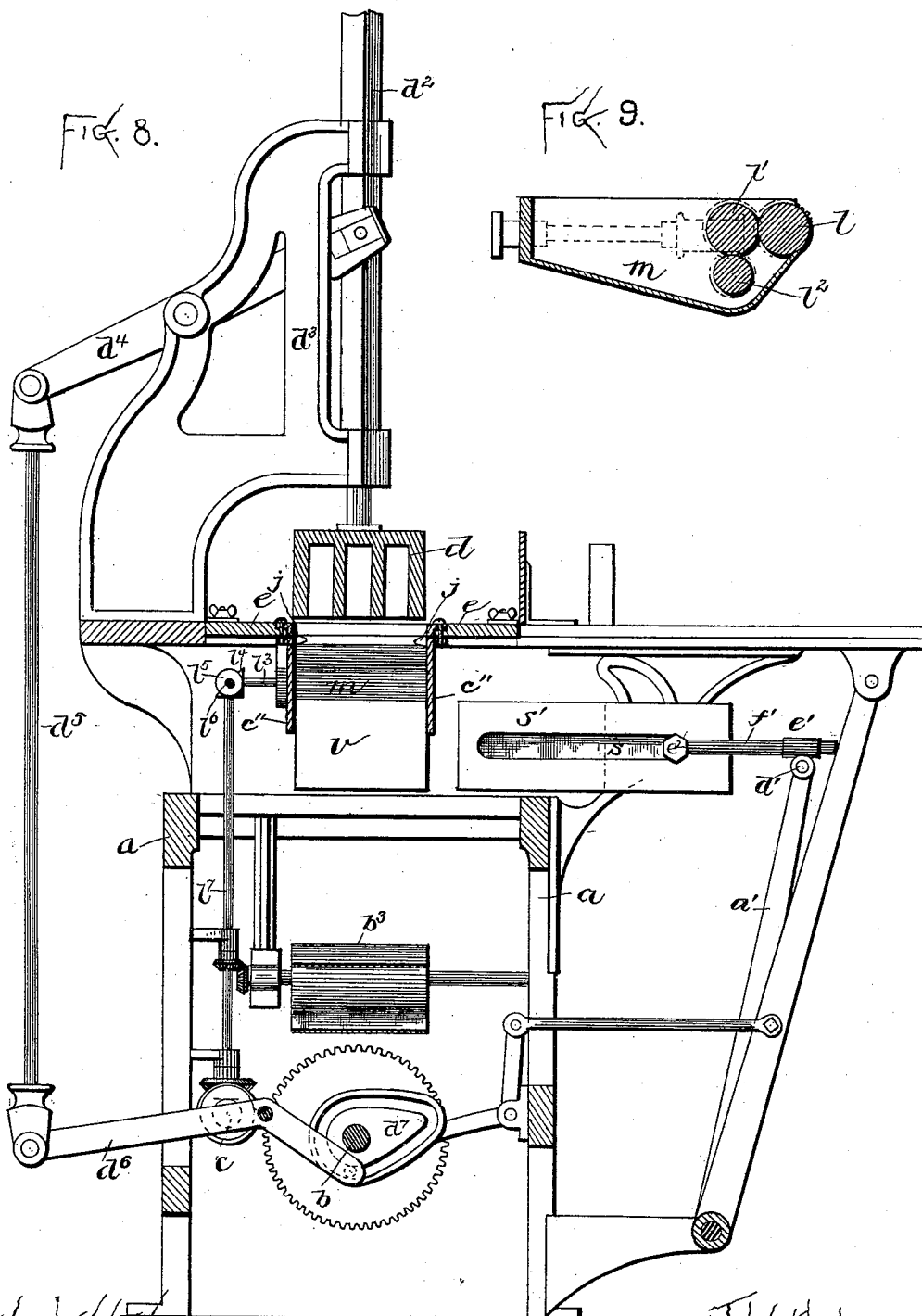
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WITNESSES  
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INVENTOR:  
HENRIED. STONE,  
BY HIS ATTORNEYS, *Wright Brown & Cooley*

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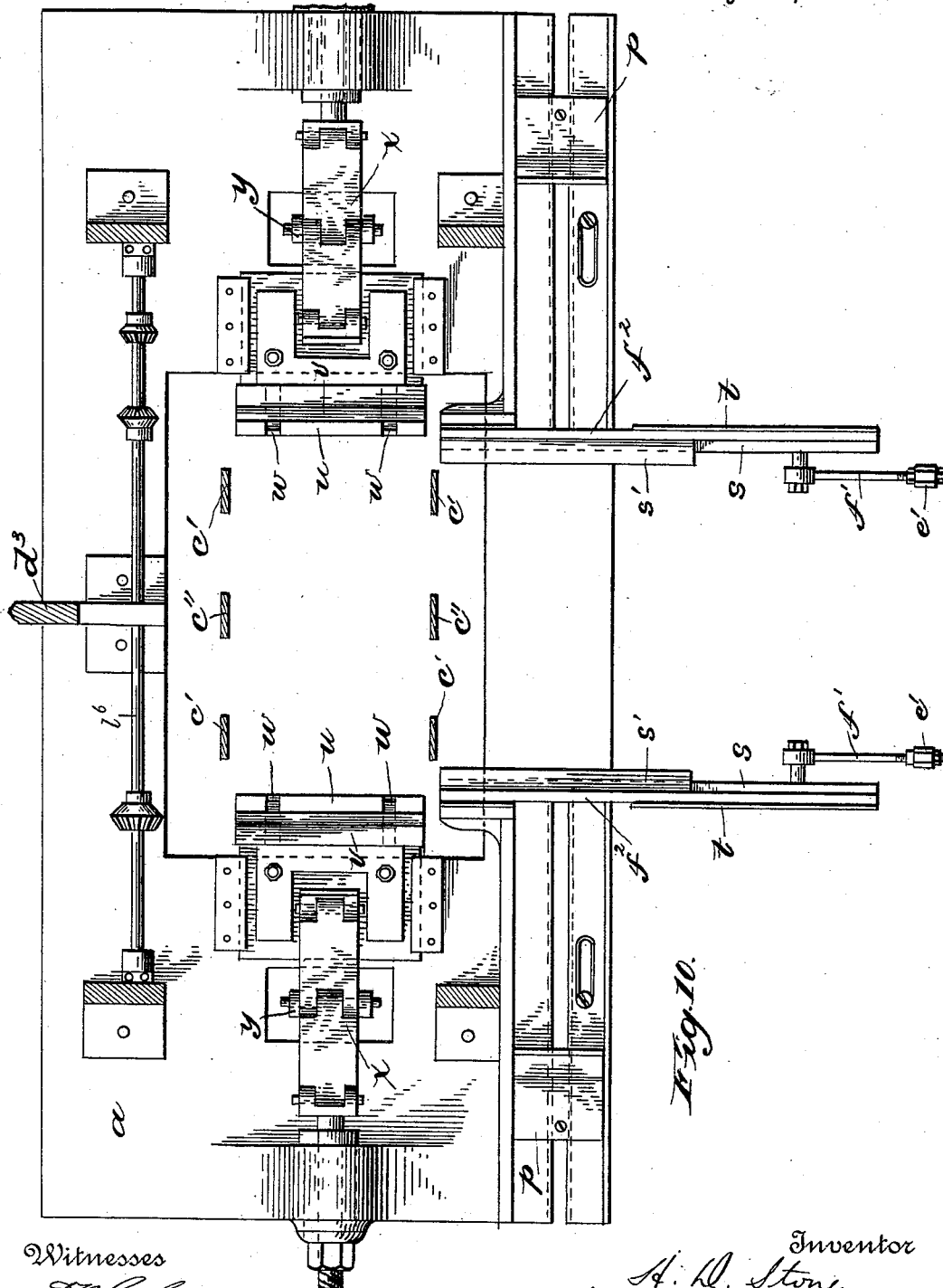


Fig. 10.

Witnesses

*Geo. H. Evans*

Inventor

*H. D. Stone*

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Attorneys

# UNITED STATES PATENT OFFICE.

HENRIE D. STONE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO JAMES S. NEWELL & CO., OF SAME PLACE.

## PAPER-BOX-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 523,295, dated July 17, 1894.

Application filed July 19, 1892. Serial No. 440,452. (No model.)

*To all whom it may concern:*

Be it known that I, HENRIE D. STONE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Paper-Box-Making Machines, of which the following is a specification.

This invention has relation to that class of paper-box making machines which are contrived to form a box from three pieces of card or strawboard; the sides and bottom of the box being formed from one piece, and the ends formed from separate pieces pasted upon flanged portions of the sides and bottom.

It is the purpose of the invention to provide improvements in machines of the kind mentioned which will render the same more efficient, rapid, and certain of operation than heretofore.

To these ends the invention consists of the improved parts and groups of parts which I will now proceed to describe and claim, reference being had to the annexed drawings and letters marked thereon, forming a part of this specification, the same letters designating the same parts or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 is a side elevation of my improved box-making machine. Fig. 2 is a front elevation of the same. Fig. 3 is a top plan view of the gage plates, guides, and means for operating upon the blank forming the sides and bottom of the box. Fig. 4 is a front view of the same. Fig. 5 is a perspective view of the sides and bottom of a box ready to have end pieces applied thereto, one of the latter being shown. Fig. 6 illustrates front and top plan views of certain parts employed in introducing the end pieces, hereinafter more particularly described. Fig. 7 is a perspective detail hereinafter referred to. Fig. 8 is a section on line 8—8 of Fig. 2. Fig. 9 is a detail section of the paste box. Fig. 10 is a slightly enlarged sectional plan view on line 10—10 of Fig. 1, the paste boxes and some other details being omitted.

In the drawings I have entirely omitted illustration of mechanism for feeding the blanks forming the sides and bottom of the box, since the same constitutes no part of the present invention, and may be the same as is

shown in an application bearing even date herewith, Serial No. 443,757, filed by myself and Charles Thibodeau, or it may be of any other suitable form and construction.

*a* designates the frame of the machine, in the lower part of which there is journaled the cam shaft *b*, operated by the driving shaft *c* with which it is geared.

*d* is the former plunger carried by the lower end of a vertically reciprocatory rod *d*<sup>2</sup> arranged in suitable bearings connected with the upright or bracket *d*<sup>3</sup>, upon which is fulcrumed a lever *d*<sup>4</sup>, the forward end of which is loosely connected with the rod *d*<sup>2</sup>, the rearward end being pivoted upon the upper end of a rod *d*<sup>5</sup> the lower end of which last-mentioned rod is pivotally connected with the outer end of a lever *d*<sup>6</sup> pivoted upon the frame, and adapted at its inner end to be acted upon by a cam *d*<sup>7</sup>. This construction and mode of operation are similar to that of like parts and constructions shown and described in the application of myself and Charles Thibodeau, Serial No. 427,445, filed April 2, 1892.

*e f* designate the gage plates, through the opening formed between the inner edges of which the former *d* reciprocates in the operation of molding or forming a blank for the sides and bottom of a box.

The gage plates *e* are provided with slots *e*<sup>3</sup> (see Fig. 3) and plates *f* are provided with slots *f*<sup>3</sup> (as indicated by dotted lines in Fig. 3). Through each of the pair of slots *e*<sup>3</sup> *f*<sup>3</sup> extends a bolt *g*<sup>3</sup> having the wing nut *h*<sup>3</sup>. By loosening the nuts *h*<sup>3</sup> the plates *e* and *f* can be adjusted on each other, in an obvious manner, when different sizes of boxes are to be made, and secured in such position by tightening them. Guideways *g* are adjustably secured to the plates *f* by means of extensions *g*<sup>4</sup> fitted to said plates *f* slotted for the passage of the securing bolt *g*<sup>5</sup>, the slot permitting the guideway to be adjusted in an obvious manner. Extending rearward from each guideway *g*, as shown in Fig. 3, is a rod *g*<sup>6</sup> having at its end stop *g*<sup>7</sup>.

Supposing the former or plunger to be up and that a blank has been fed in thereunder on the guideways *g*, until its farther corners reach the stop *g*<sup>7</sup> the former may descend, pressing down the portion of the blank to

form the bottom of the box, while the inner edges of the gage plates *e* will turn up the side portions *h* and the gage plates *f* will partially fold up the flanges *i* on the ends of the bottom portions. As the blank is pressed down by the former, the conical rollers *j* located at the corners of the path of movement of the former, will act on the ends of the side portions so as to fold over the flanged parts *k*. On the further descent of the former the paste rollers *l*, (shown by dotted lines in Fig. 2,) which extend from side to side of the machine under the gage plates *f*, come in contact with the flanged parts *i k* and apply paste to the outer surface of the same, and at the same time press said flanged parts firmly against the ends of the former.

The object of providing the rollers with a conical shape is that they may give only the corner crease to the flanged parts *k* and bend them only partially, leaving the final turning over of the said parts to the paste rollers *m* which will thus have a slight wiping action as they apply the paste and press said parts against the ends of the former *d*.

The paste rollers *l* are journaled in the forward or inner ends of the paste boxes *m*, supported beneath the gage plates *f* by bolts or screws *m'*. Said paste rollers *l* receive paste from other rollers *l'* *l''* in the paste boxes, which latter rollers are operated by means of gears and shafts from the main shaft, or by any other suitable means. As indicated in Fig. 8, the lower roller *l''* has its shaft *l'''* extended out from box *m* and provided with a bevel pinion *l'''* meshing with a bevel pinion *l''''* secured to a counter shaft *l'''''*, and the latter is operated by similar pinion connection with a vertical shaft *l''''''* which in turn is geared to shaft *c*.

*n* designates tables or beds upon which the end pieces *o* are stacked or piled, and are moved inward by followers *p* acted upon by cords *q* and weights *r*, so that the innermost piece *o* will be pressed against the faces *f''* of the feed slides *s* (see Fig. 6) on the outer part of each of which is a strip *t* of a thickness equal to or a little less than the thickness of the stock composing an end piece, so that each time the slides *s* move inward, each strip *t* will engage the end of the end-piece resting against the face *f''* of the slide and carry inward the said end piece to position directly opposite the ends of the former and the molded blank thereon, the lower edges of the end pieces thus fed in resting upon the shelf-like piece *u*, attached to each platen or plate *v*, as indicated in Figs. 6 and 10 with the upper edge resting against the platens or plates *v*, this leaning of the end pieces resulting from the fact that the faces of the slides are similarly inclined, all as clearly shown in Fig. 6. The slides *s* are dove-tailed to uprights *s'* suitably supported by the frame of the machine.

To the bottom of each of the shelf-pieces *u* are attached springs *w*, the free ends of which

are curved up through notches formed in said shelf-piece and serve to keep the lower edge of the end piece from being jostled off its support by the vibration of the machine after the retreat of its feed slide. In the lower part of Fig. 6, the feed slide *s* is not shown, for the reason that said view is a plan of only a portion of the platen *v* and the shelf piece *u* with its spring *w*.

The platens or plates *v* (which are shown by dotted lines in Figs. 2 and 6) may be of the same form and be operated in a similar manner to those for a similar purpose, shown in the application for a patent last hereinbefore referred to, in which, as is herein indicated they are reciprocated by means of toggle levers *x* connected to a pitman *y* acted upon by a cam *z* on the cam shaft. The relation of these parts to the rest of the machine is clearly shown in said other application.

After end pieces *o* have been fed in upon the shelf pieces and the feeding slides have retreated the platens *v* will be moved up, pressing the said end pieces against the flanged parts *i k* of the box on the ends of the former and pasting them thereon, completing the formation of the box. When the former or plunger rises it will leave the box held by friction between the plates *c' c''* for the paste to set and the crimpings of the box to become fixed until the former descends with the next blank which operation will push the box so held down so that it may drop upon a belt or apron *b''* and be carried away thereby. The holding plates *c' c''* extend downward from the plates *e*, and the rollers *j* are mounted in bearings at the outer upper corners of the plates *c'*, as shown in Figs. 4 and 7.

In Fig. 2, the plates *c'*, *c''* are indicated only by dotted lines, in order not to conceal the parts behind them.

The feeding slides *s* are actuated by the levers *a'* having connections with cams *b'* on the cam shaft. The levers *a'* at their upper ends are forked, as shown, and in the ends of the forked arms are rods *d'*, upon which are pivoted the nuts or boxes *e'* for the reception of the outer ends of the rods *f'* pivotally connected at their inner ends to pins *e''* which project from the slides *s* through longitudinal slots formed in the uprights *s'*. The boxes *e'* are made adjustable longitudinally on the rods *d'* and the rods *f'* are made longitudinally adjustable in the nuts or boxes *e'*. This provision being made for the purpose of adapting the machine to use in making boxes of varying size.

It is obvious that changes may be made in the form and arrangement of parts comprising my improvements without departing from the nature or spirit thereof.

What I claim is—

1. A machine for making paper boxes comprising in its construction a former, gage plates between the inner edges of which the former reciprocates, and conical rollers sup-

ported in proximity to the path of travel of the corners of said former, as set forth.

2. A machine for making paper boxes comprising in its construction a former, gage plates between the inner edges of which the former reciprocates, conical rollers supported in proximity to the path of travel of the corners of said former, and paste rollers below the gage plates adapted to be brought into contact with the flanged portions of the blank on the ends of the former, as set forth.

3. A machine for making paper boxes comprising in its construction a former, gage plates, platens to press the sides of the box against the former, and the notched supporting shelf *u* carried by each of said platens and having springs *w*, as set forth.

4. A machine for making paper boxes comprising in its construction a former, gage plates, a slide *s* at each end of the frame of the machine, and mechanism for operating each slide and consisting of a forked lever *a'*, rod *d'*, nut or box *e'* adjustable on the rod, and rod *f'* adjustable in said box and pivoted to the slide, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 9th day of July, A. D. 1892.

HENRIE D. STONE.

Witnesses:

ARTHUR W. CROSSLEY,  
KATHARINE E. BROWN.