

(No Model.)

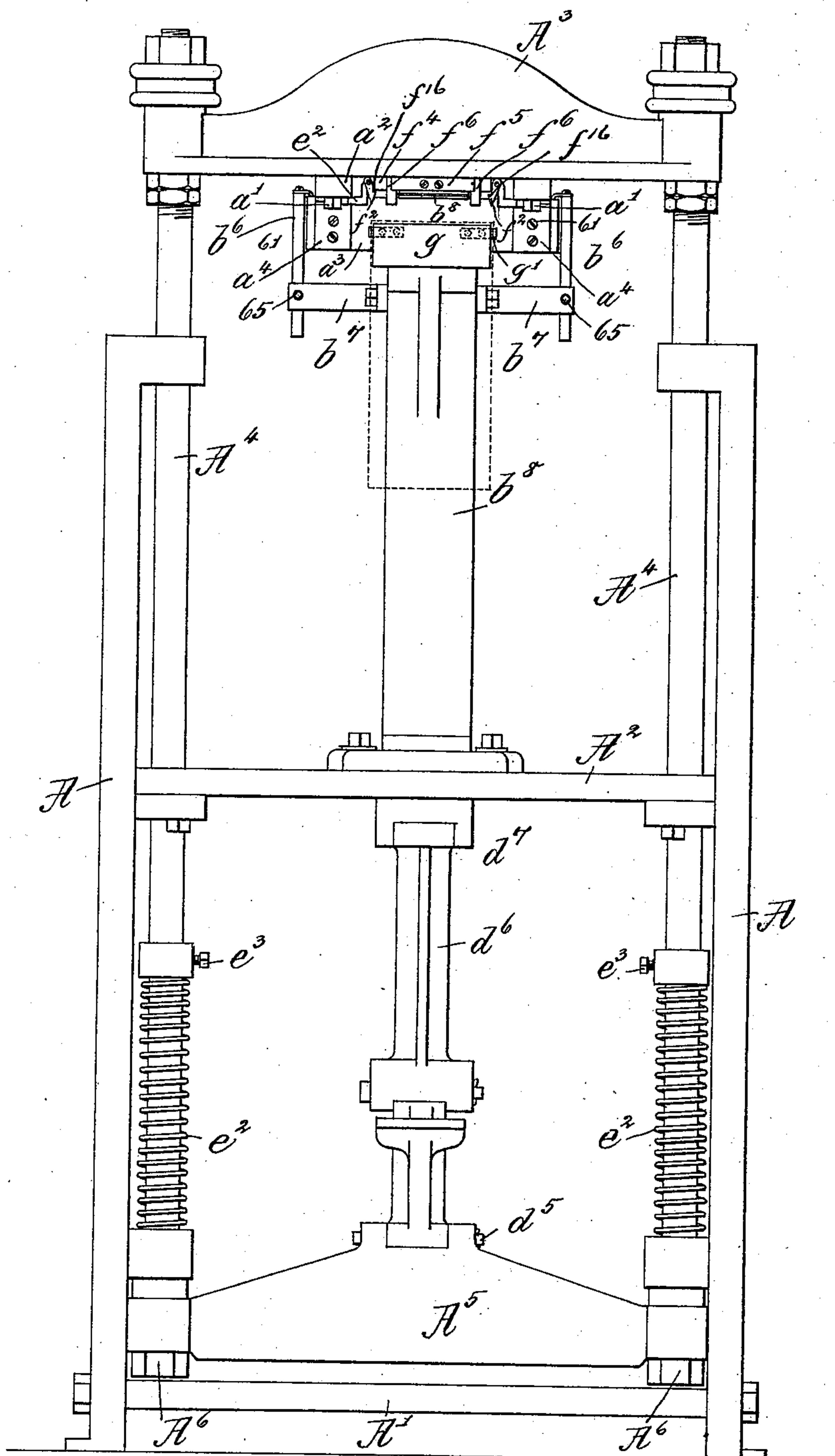
3 Sheets—Sheet 1.

G. H. CUSHMAN.
PAPER BOX MACHINE.

No. 364,161.

Patented May 31, 1887.

Fig: 1.



Witnesses.
Arthur Zippenden.
John F. Co. Printer.

Inventor
George H. Cushman.
by Leroy Gregory attys.

(No Model.)

G. H. CUSHMAN.
PAPER BOX MACHINE.

3 Sheets—Sheet 2.

No. 364,161.

Patented May 31, 1887.

Fig: 2.

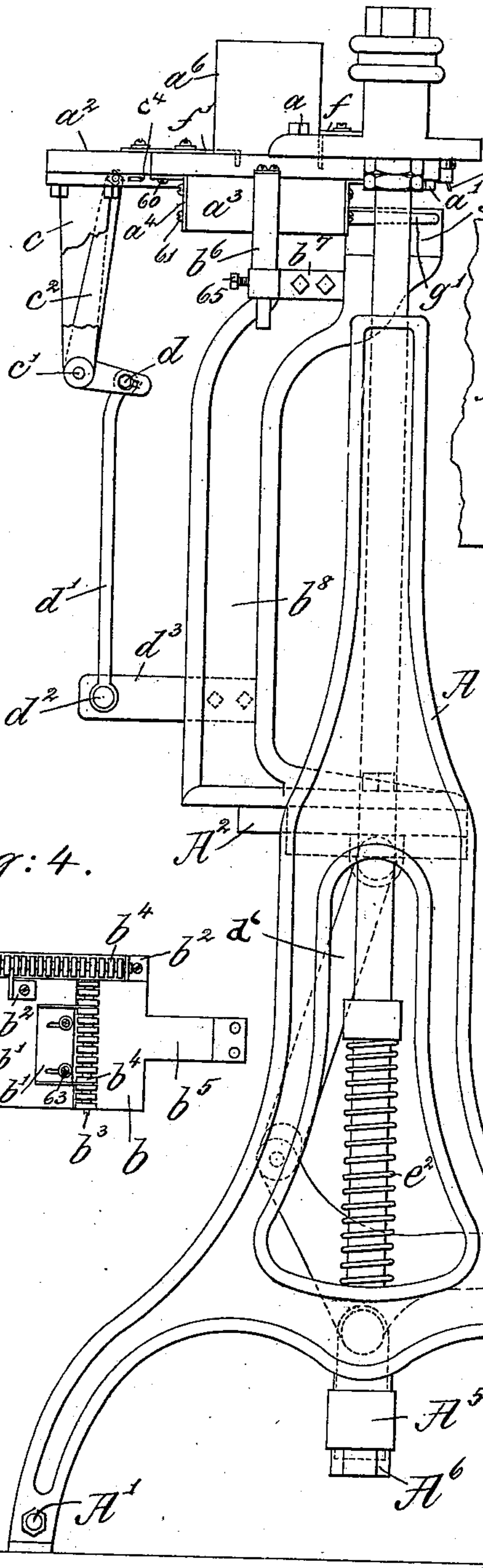


Fig:3.

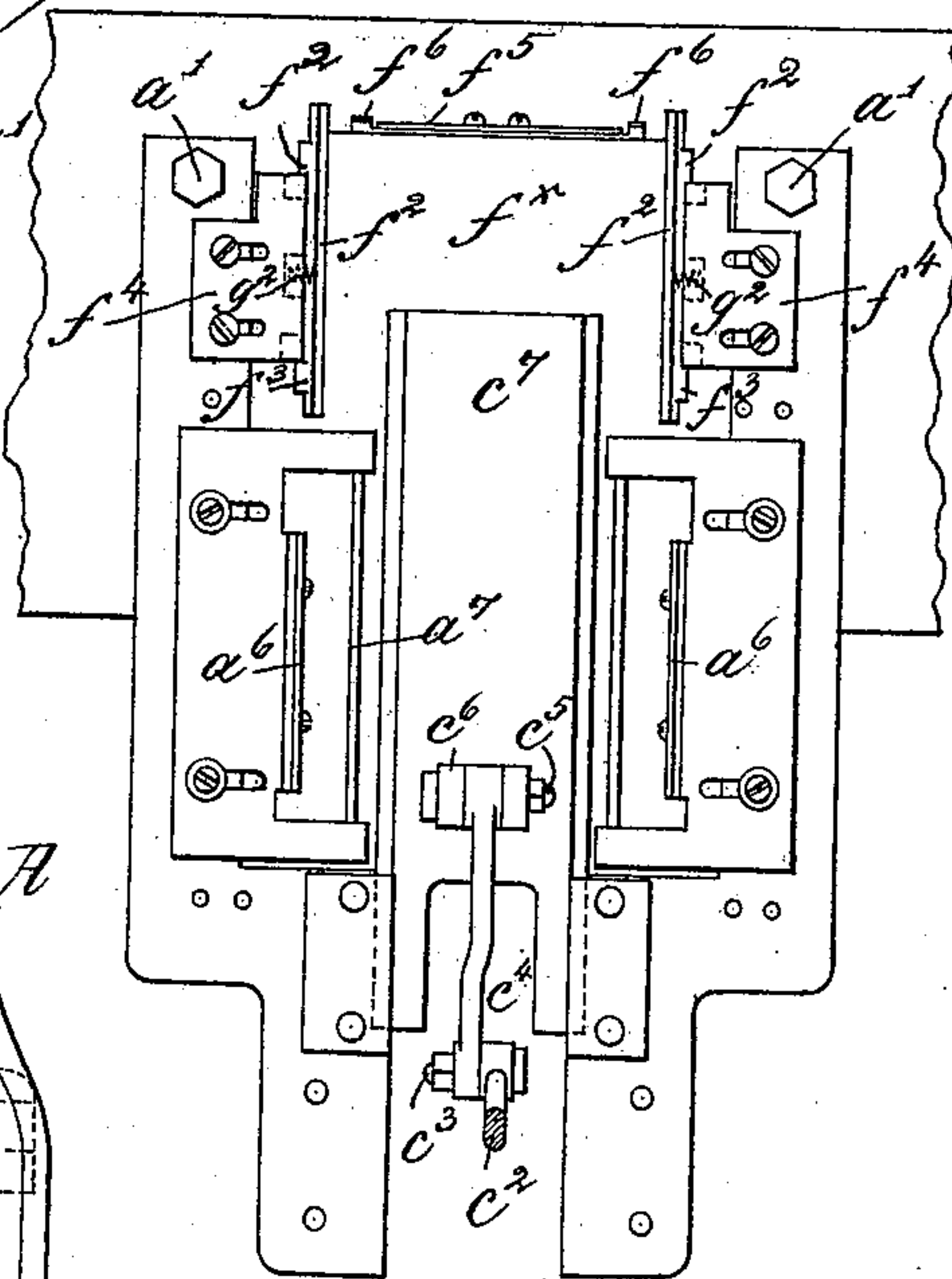


Fig: 3^a

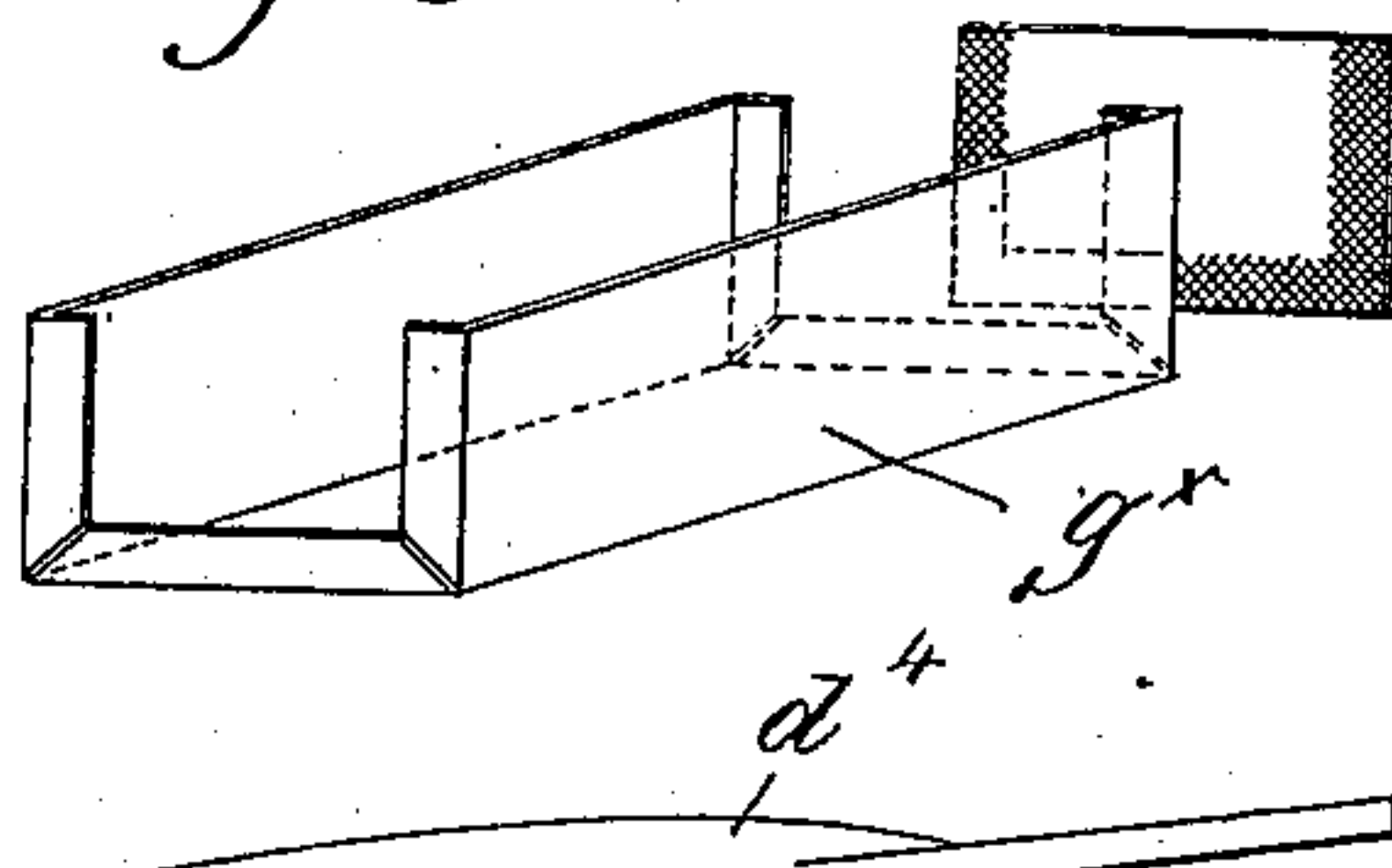
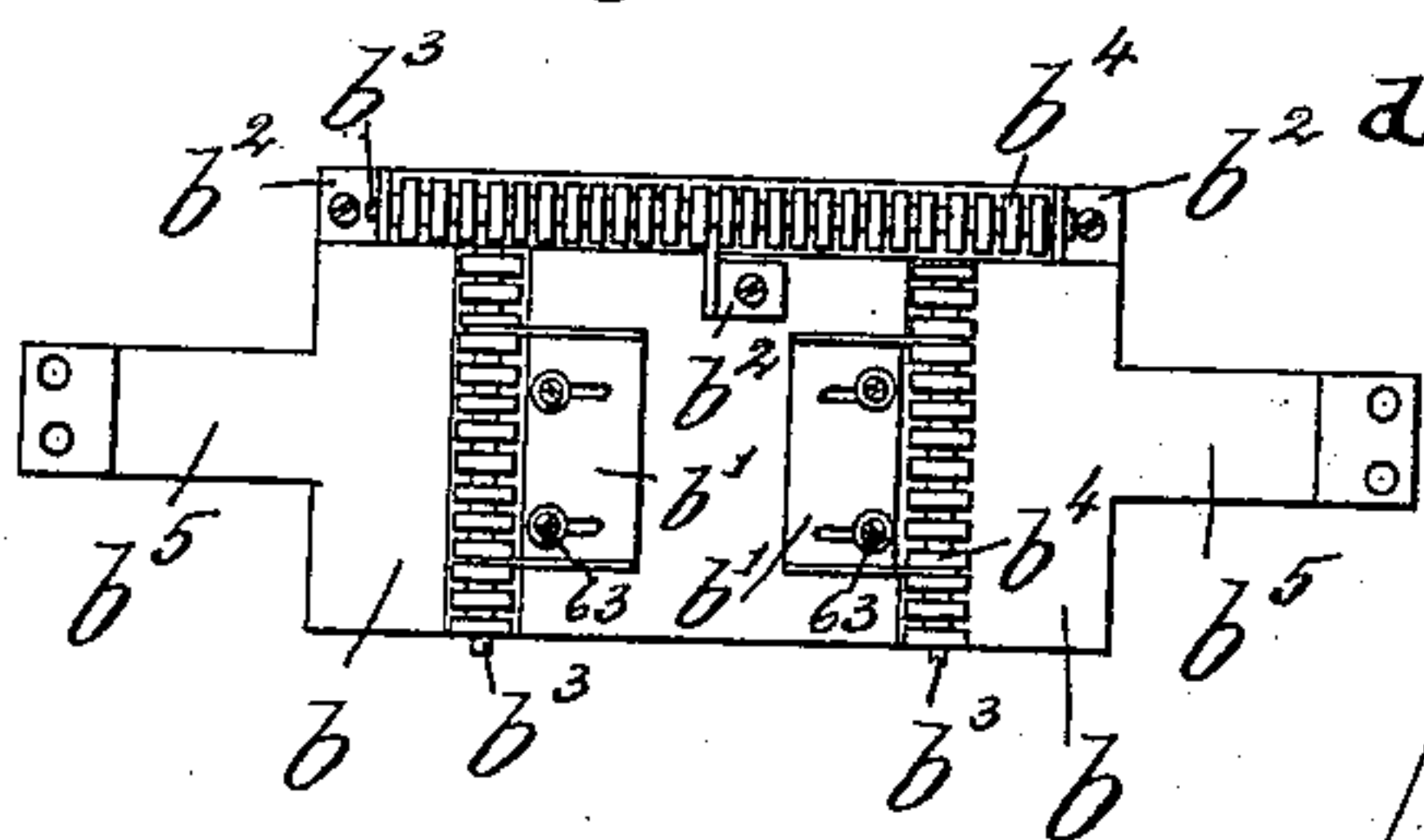


Fig: 4.



Witnesses.

Arthur Zipperlen.

John F. C. Pennington

Inventor.

George H Cushman.

by Crosby Gregory atty

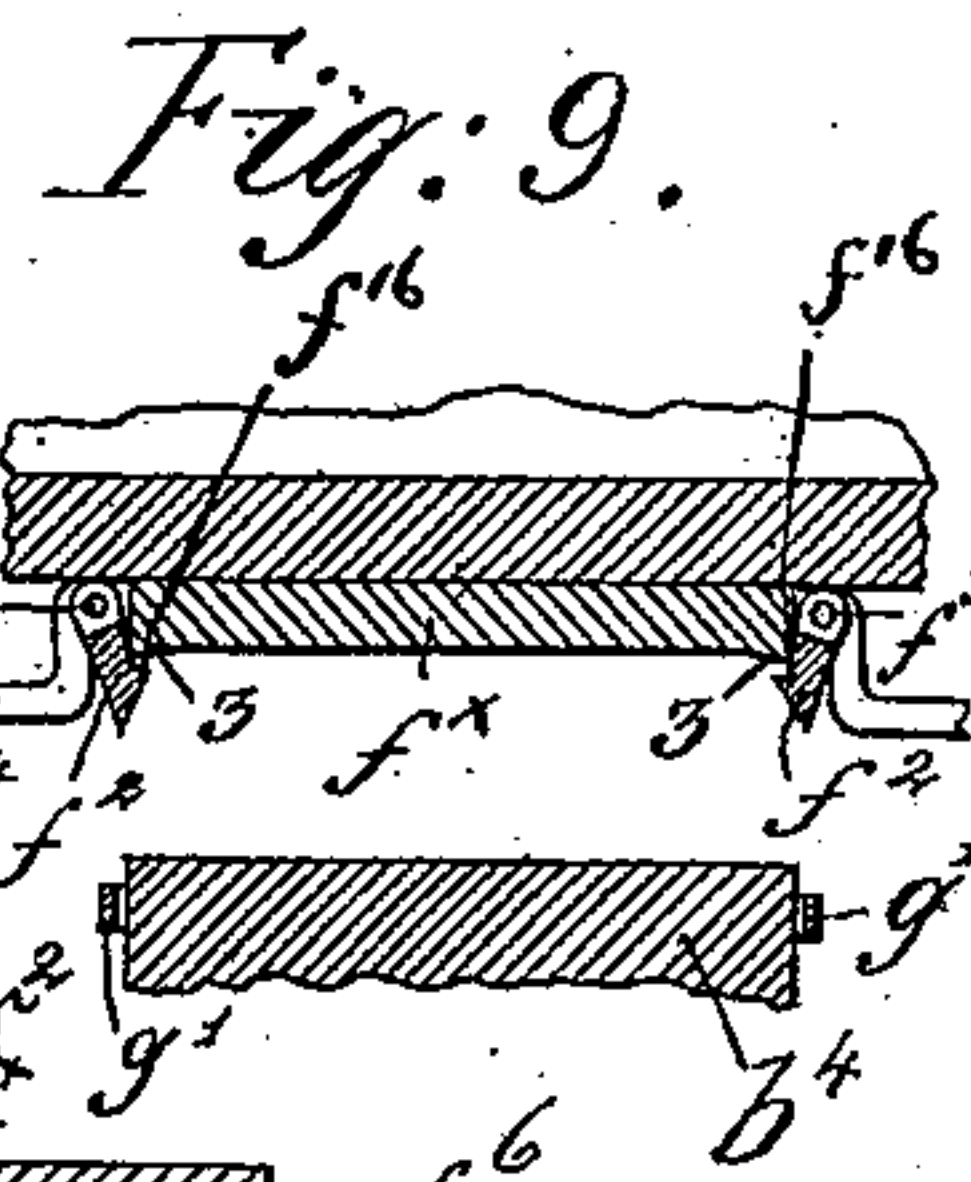
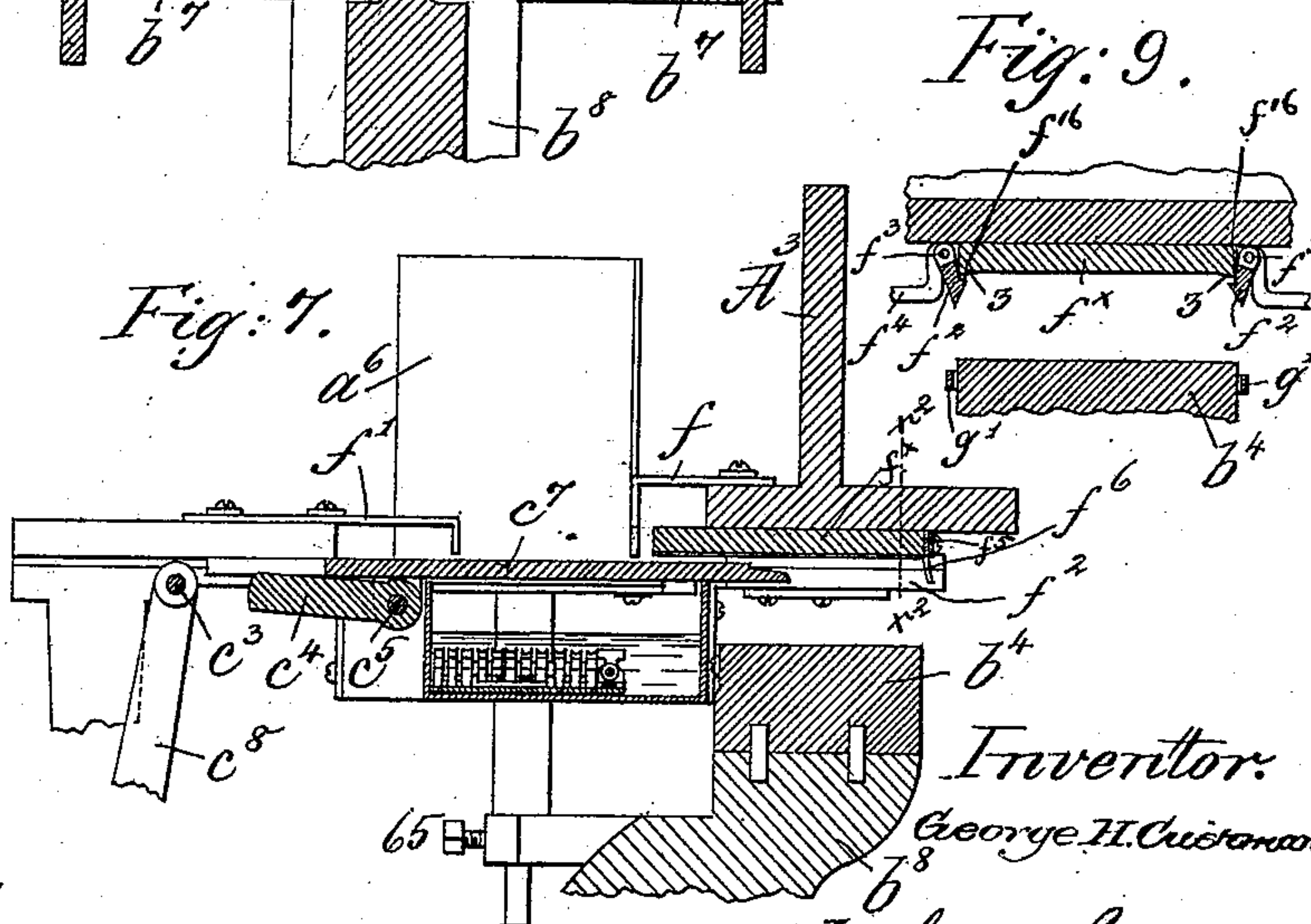
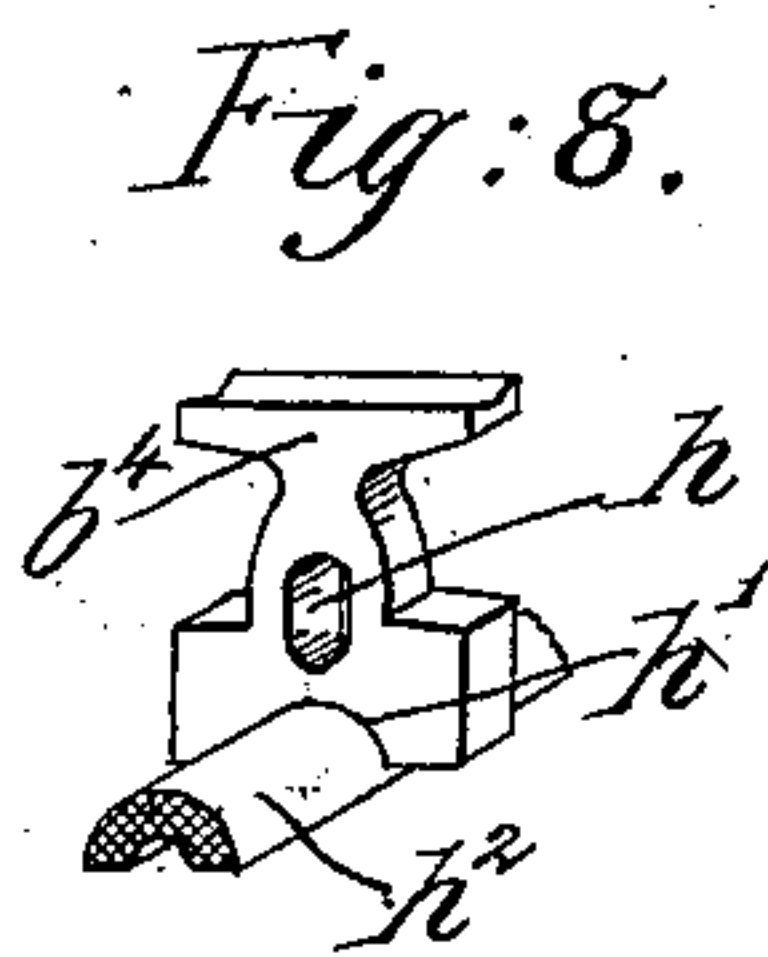
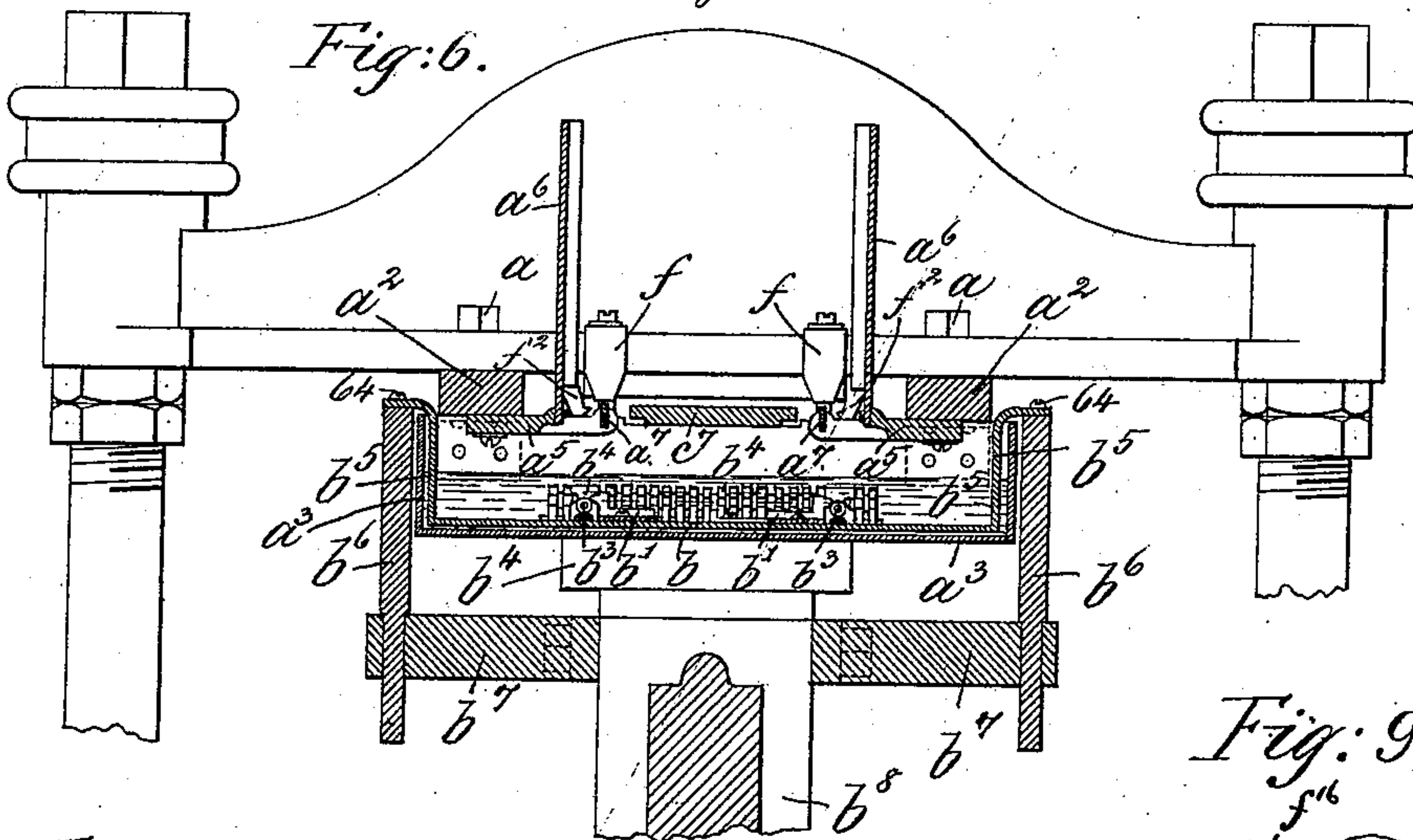
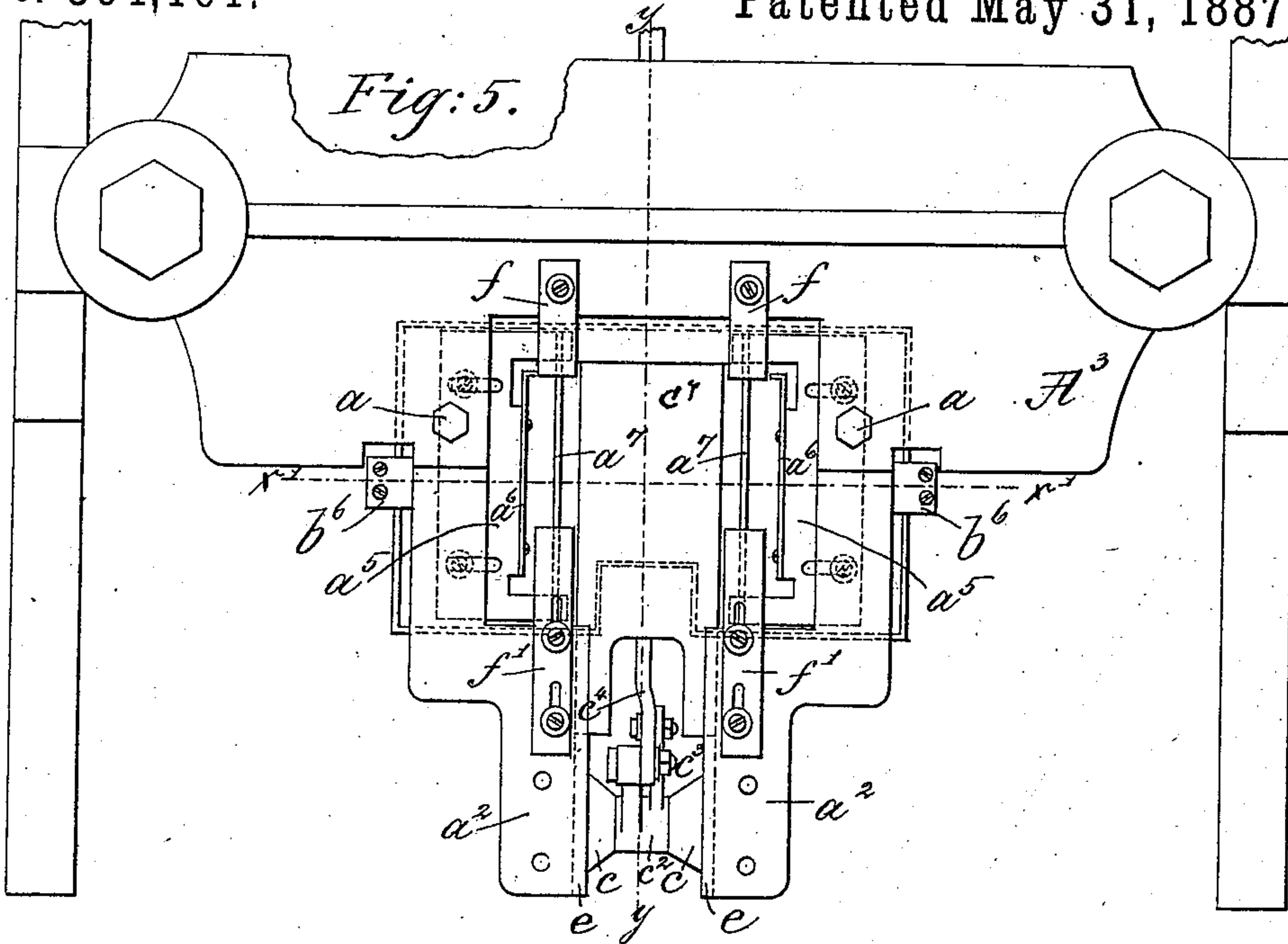
(No Model.)

3 Sheets—Sheet 3.

G. H. CUSHMAN.
PAPER BOX MACHINE.

No. 364,161.

Patented May 31, 1887.



Witnesses.
Arthur J. Juppelen.
John F. L. Forwick.

Inventor.
George H. Cushman.
By Crosby & Gregory, Attys.

UNITED STATES PATENT OFFICE

GEORGE H. CUSHMAN, OF LYNN, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO CHLOE P. CUSHMAN, OF SAME PLACE, AND SPAULDING & TEWKSBURY, OF BOSTON, MASSACHUSETTS.

PAPER-BOX MACHINE.

SPECIFICATION forming part of Letters Patent No. 364,161, dated May 31, 1887.

Application filed April 12, 1886. Serial No. 198,530. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. CUSHMAN, of Lynn, county of Essex, and State of Massachusetts, have invented an Improvement in Paper-Box Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to paper-box machines, and has for its object to improve the construction of the same, whereby a blank, which is to form one end of the box, is pasted, and thereafter automatically fed forward into position above the box-rest to have its pasted side brought into contact with the body of the box, supported by the said box-rest, all in continuous operation.

In paper-box machines as heretofore constructed and known to me each end blank had one of its sides pasted at the edges, and the blank so pasted was removed by the operator and placed upon the box-body held by the box-rest, the end blank being thereafter pressed firmly upon the box-body by a presser-plate, which was forced down upon the said end blank by the operator working a treadle, said treadle through suitable mechanism imparting a downward movement to said presser-plate.

My invention consists, essentially, in the combination, with a pasting mechanism, a box-rest, and a presser-plate, of an automatically-operating feeder, whereby the pasted end blank is transferred from the pile of blanks into position to be forced closely in contact with the end of the box-body.

As the end blank is being fed into position under the presser-plate it travels in a guideway, which insures the correct presentation of the end blank to the box-body, thereby enabling the end blank to be applied uniformly.

Other features of my invention will be described, and will be specified in the claims.

Figure 1 is a front elevation of a machine by which to practice my invention; Fig. 2, a side elevation of Fig. 1; Fig. 3, an underside view of part of the cross-head and its attached parts, the paste-pan and angle-irons being omitted; Fig. 4, an enlarged detail showing the pasters and plate, to which they are se-

cured, as removed from the paste-pan; Fig. 5, a top view of the machine; Fig. 6, a transverse section of Fig. 5 on line $x' x'$; Fig. 7, a longitudinal section of Fig. 5 on line $y y$; Fig. 8, an enlarged detail of one of the pasters detached; Fig. 9, a sectional detail to more plainly show the form of the presser-plate, the section being taken on line $x^2 x^2$, Fig. 7, and Fig. 3^a a perspective view of a box-body and pasted end blank.

The frame-work of the machine, consisting of the sides A, united by the rods A' and girder A², the movable cross-head A³, secured to the vertically-sliding rods A⁴, extended through guides attached to the sides A, and also the girder A², as shown in Fig. 1, and secured to the foot-plate A⁵ by nuts A⁶, are and may be of any ordinary construction, such as found in paper-box machines.

The movable cross-head A³ has secured to its under side, by bolts $a a'$, (see Figs. 1, 5, and 6,) arms or plates a^2 , which extend rearward therefrom horizontally. These arms near the center of their length have attached to them by screws 60 angle-irons a^4 , (see Fig. 2,) which by screws 61 are attached to a pan, a^3 , containing paste, the said pan being thus suspended below the said arms and extending across the space between them.

Above the top of the pan a^3 the arms a^2 have adjustably secured to them the base portions a^5 (see Fig. 6) of the blank-guides a^6 , the said base portions also supporting tracks a^7 , upon which rests the lowest end blank as it is being fed forward by the feeder, as will be described.

Within the pan a^3 , and normally resting on its bottom, is a plate, b , (see Figs. 4 and 6,) to which are secured plates $b' b^2$, said plates supporting rods b^3 , upon which are placed pasters b^4 , the plates b' being adjustable by screws 63 in slots thereof, so that the pasters may be moved to be adapted to operate on end blanks of different sizes, the pasters on the rods supported by the plate b^2 being extended the length of the plate b . The plate b is herein shown as having arms b^5 , one at each end, which are extended up over the sides of the pan a^3 , as best shown in Fig. 6, wherein they are secured by screws 64 to uprights b^6 , one at

each side of the machine, which are held by screws 65 in brackets b^7 , attached to an upright, b^8 , supported by the girder A^2 .

To the under side of the arms a^2 , and at the rear of the machine, are two depending studs, c , (see Figs. 2 and 5,) which, as herein shown, converge and form bearings for an arbor, c' , on which is pivoted an elbow-lever, c^2 . The long arm of the lever c^2 is connected by a pin, c^3 , to a link, c^4 , (see Figs. 2, 5, and 7,) the other end of said link being joined by a pin, c^5 , to an ear, c^6 , (see Fig. 3,) depending from the under side of a plate, c^7 , said plate constituting the end-blank feeder of the machine. The short arm of the elbow-lever c^2 is slotted to receive a stud, d , of a link, d' , pivoted by the stud d^2 to the arm d^3 , secured to the standard b^8 .

The cross-head A^3 and its attached parts are herein shown as moved downward by means of a treadle, d^4 , having its fulcrum d^5 on the foot-plate A^5 , (see Fig. 1,) the other end of said treadle being joined by link d^6 to the ear d^7 at the lower side of the girder A^2 , the upper end of said link being pivoted to said ear. The cross-head A^3 and its attached parts are normally held elevated, as in Figs. 1 and 2, by springs e^2 , which encircle the rods A^4 at their lower extremities, and are each maintained in its adjusted position by a set-screw, e^3 .

Depression of the treadle causes the descent of the cross-head A^3 , and at the same time the feeder c' is drawn or moved backward in guideways e , made in the arms a^2 , (see dotted lines, Fig. 5,) movement being imparted to said feeder through the elbow-lever c^2 and secondary mechanism above described. The pasters b^4 being stationary, the cross-head A^3 in its downward movement lowers the paste-pan a^3 away from the plate b and the pasters b^4 , supported by it, leaving the said pasters uncovered by the paste in the pan, and at the same time brings the undermost end blank of the pile of end blanks between the guides a^6 in contact with said pasters, thereby wetting three edges of said blank with paste, said wetted blank being shown in Fig. 3^a, the mechanism for reciprocating the feeder being so arranged as to move it to uncover the pasters, and thereby permit the lowermost end blank to be brought against them to be pasted, as described. When the lowermost end blank has been moistened with paste, the pressure is removed from the treadle, and the springs e^2 effect the elevation of the cross-head A^3 , and with it the paste-pan, the paste contained therein again covering the pasters b^4 . Bent fingers $f f'$, secured (see Figs. 5 and 6) to the upper side of the cross-head A^3 and arms a^2 , act as additional guides for the end blanks, the fingers f' being adjustably secured to the arms a^2 . The fingers f are of sufficient distance above the track a^7 to permit the passage beneath them of a single end blank acted upon by the feeder.

As the cross-head A^3 and its attached parts

are restored to their normal positions by the springs e^2 , the feeder c' is moved forward, pushing the bottom blank before it upon the tracks a^7 and beneath the fingers f . As the end blank referred to is pushed forward by the feeder, it enters into and is fed forward in a groove, f^{16} , (see Figs. 1 and 9,) in the guide-rails f^2 , said rails being hinged at f^3 to plates f^4 , adjustably secured to the cross-head A^3 . (See Fig. 3.)

Between the rails f^2 and secured to the cross-head A^3 is a presser-plate, f^x , to the front face of which is fastened a preferably metal strip, f^5 , and springs f^6 , to limit the forward movement of the end blank.

Below and in line with the presser-plate f is a box-rest, g , supported upon the standard b^8 , said box-rest having along its sides spring-arms g' , (see Figs. 1 and 2,) by which the box-body g^x (see Fig. 3^a) is clamped to and held in position on the said box-rest to receive the blank, which will form one end of the box when completed, the sides and bottom of the box-body being first bent or turned, as shown in Fig. 3^a, so that the said bent portions will rest upon the upper face of the box-rest.

With the pasted end blank supported by the rails f^2 above the box-rest, the operator places a box-body upon said box-rest and applies pressure to the treadle, thus bringing the pasted side of the end blank in contact with the bent portions of the box-body on the box-rest, the pressure upon the treadle being sufficient to cause the end blank to firmly adhere to the said bent portions, to thus form an end for the box.

The spring-arms slide over the box-body and serve to clamp it firmly to the box-rest, and the rails f^2 being hinged are permitted to pass by the sides of the box-rest in the downward movement of the cross-head A^3 , a spring, g^2 , (see Fig. 3,) restoring said rails to their normal position in the upward movement of the head A^3 , and the end blank being a trifle smaller than the end of the box-body to which it is pasted, the said hinged rails will in no way interfere with the end of the box in said upward movement; but instead of being hinged the rails may be integral with the blocks f^4 and the blocks themselves slide backward and forward. Thus it will be noticed that while one end blank is being pressed upon a box-body to form an end, a second end blank is being pasted, and on the upward movement of the head A^3 said pasted end blank is automatically fed forward into position to form the other end of the box.

Referring to Fig. 9, it will be seen that the presser-plate, instead of being preferably flat, is of greater thickness nearest the edges, as at 3, in order to obtain great pressure on the sides of the end blanks, only those edges of the presser-plate which press upon the sides of the end blank being so thickened.

Referring to Fig. 8, it will be seen that each paster b^4 is grooved at its top, so that as the paste is removed from the pasters during the

downward movement of the head A^3 a small quantity of paste will be retained in said groove, said groove permitting a greater quantity of paste to be brought into contact with the end blank and effecting a more even distribution of said paste. Each paster also has a slot, h , through which the rod b^3 is extended, each of said pasters by reason of said slot obtaining a slight pivotal or rocking movement, whereby inequalities in the surface of the end blank in one direction are overcome, while inequalities of said surface in a direction at right angles to the first-mentioned direction are overcome by means of a vertical movement imparted to said paste by a yielding substance, preferably a thin rubber tube, h^2 , placed beneath the pasters, and adapted to fit into the arched portion h' at the bottom of each paster; but instead of a rubber tube each individual paster may have a spring placed beneath it.

I have herein shown a treadle as one means of operating the head A^3 ; but I do not desire to limit my invention to such construction, as in many instances it will be desirable to operate the machines by power applied from a shaft, such a change in no way affecting the operation of the machine. Furthermore, it may be desirable to make the head stationary and have the box-rest movable, such arrangement requiring but little change in the machine.

I claim—

1. In a machine for the manufacture of paper boxes, a box-rest for the box-body, and a presser-plate co-operating therewith, pasters, and guides to hold the end blanks above said pasters, combined with a reciprocating feeder, substantially as described, whereby the pasted end blanks are automatically fed from the guides to a position between the presser-plate and box-rest, to be united to and form an end of the box-body, substantially as described.

2. In a machine for the manufacture of paper boxes, a box-rest to support a box-body, combined with a presser-plate having thickened edges, whereby increased pressure may be exerted upon the pasted edges of the end blank, substantially as described.

3. In a machine for the manufacture of paper boxes, a series of pasters provided each with a slot and arched-shaped, as at h' , combined with a rod extended through said slots

to permit the pasters to rock, and with a yielding support to permit the pasters to move vertically, whereby said pasters are enabled to adapt themselves to variations in thickness of the end blank, substantially as described.

4. In a machine for the manufacture of paper boxes, the reciprocating cross-head A^3 , the arms a^2 , and the end-blank guides, paste-pan and pasters to paste said end blanks, combined with a feeder, and means, substantially as described, to reciprocate it in one direction to uncover said pasters and permit the end blanks to be placed against them, and to thereafter reciprocate said feeder in an opposite direction to feed the pasted end blank into position to be united to and form the end of a box, substantially as described.

5. In a machine for the manufacture of paper boxes, the movable cross-head A^3 , the arms a^2 , secured to said cross-head, and guides for the end blanks, the feeder, and means, substantially as described, to reciprocate it, combined with a box-rest, presser-plate, and means, substantially as described, to guide the pasted end blank into position between the box-rest and presser-plate to be acted upon by said presser-plate, substantially as set forth.

6. In a machine for the manufacture of paper boxes, the movable cross-head A^3 , the arms a^2 , secured to said cross-head, and guides for the end blank, the feeder, and means, substantially as described, to reciprocate it, combined with a box-rest, presser-plate, and means, substantially as described, to guide the pasted blank into position between the box-rest and presser-plate, and with springs located at the front of said presser-plate to limit the forward movement of said pasted blank, substantially as set forth.

7. In a machine for the manufacture of paper boxes, the movable cross-head A^3 , guides for the end blanks, and paste-pan secured to and movable with the cross-head A^3 , combined with the stationary plate b , and pasters secured to said plate, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEO. H. CUSHMAN.

Witnesses:

G. W. GREGORY,
J. H. CHURCHILL.