

No. 672,020.

Patented Apr. 16, 1901.

A. E. STINEHOUR.

MACHINE FOR APPLYING BOTTOMS TO PASTEBOARD BOXES.

(Application filed Jan. 9, 1901.)

(No Model.)

4 Sheets—Sheet 1.

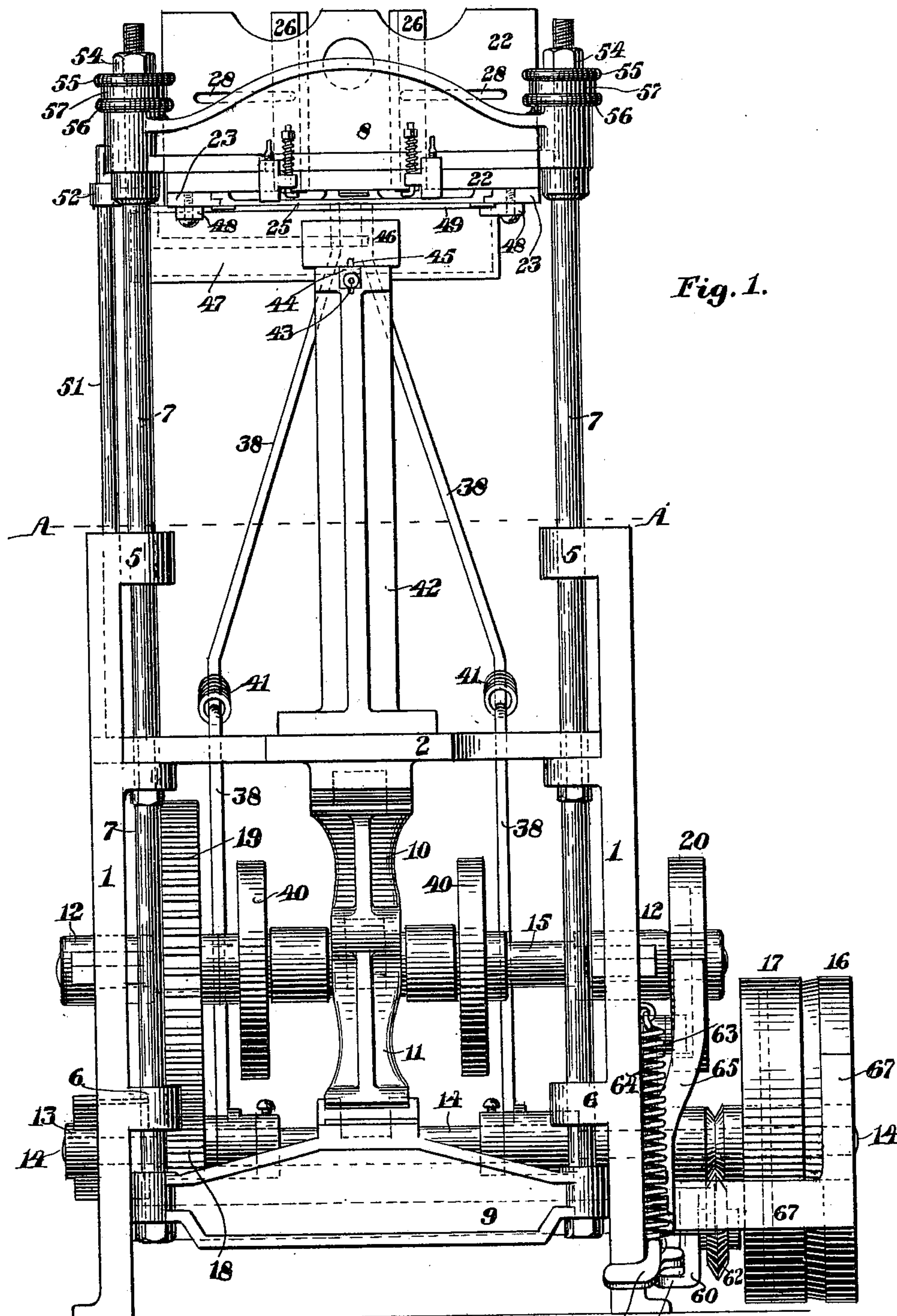


Fig. 1.

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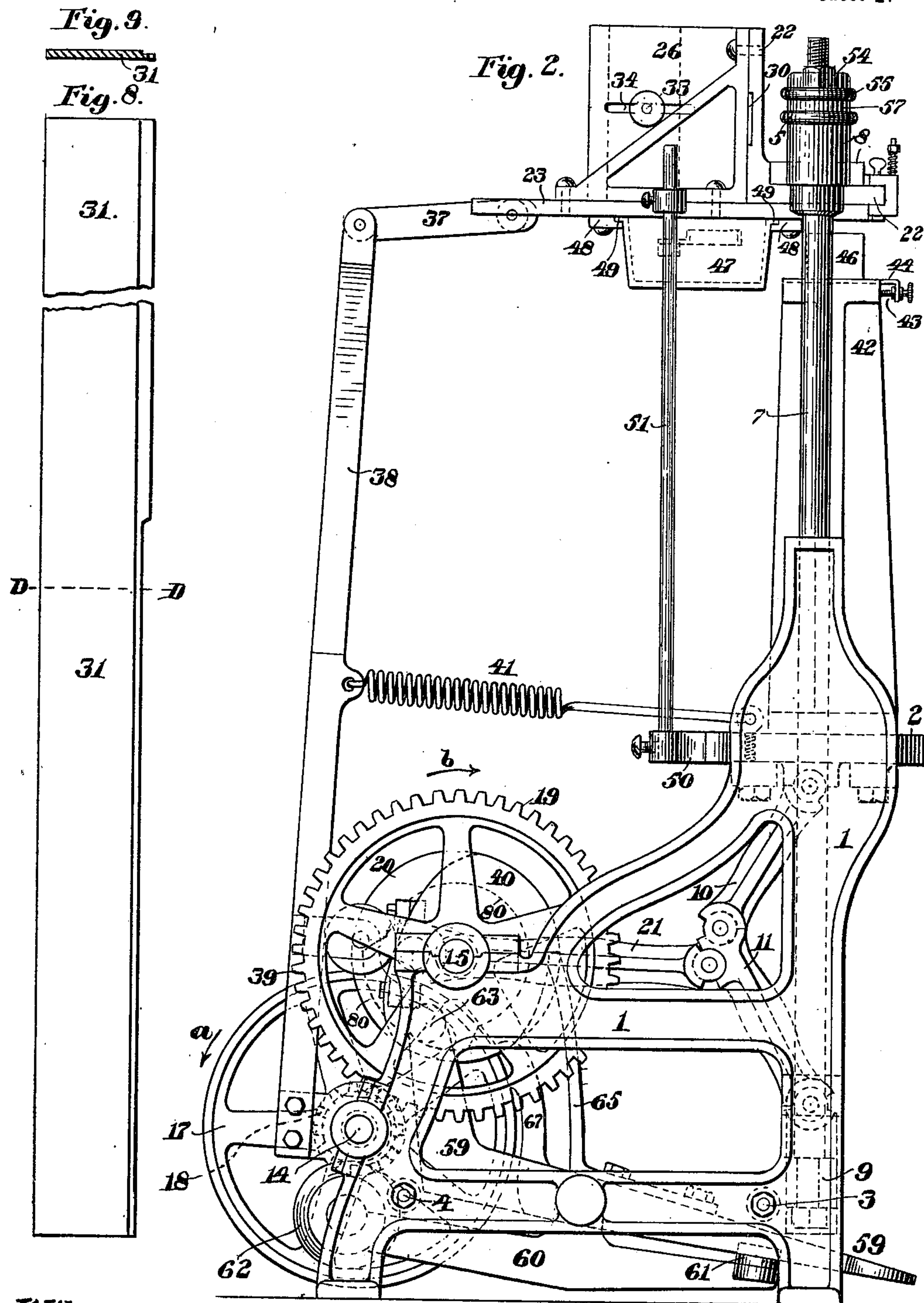
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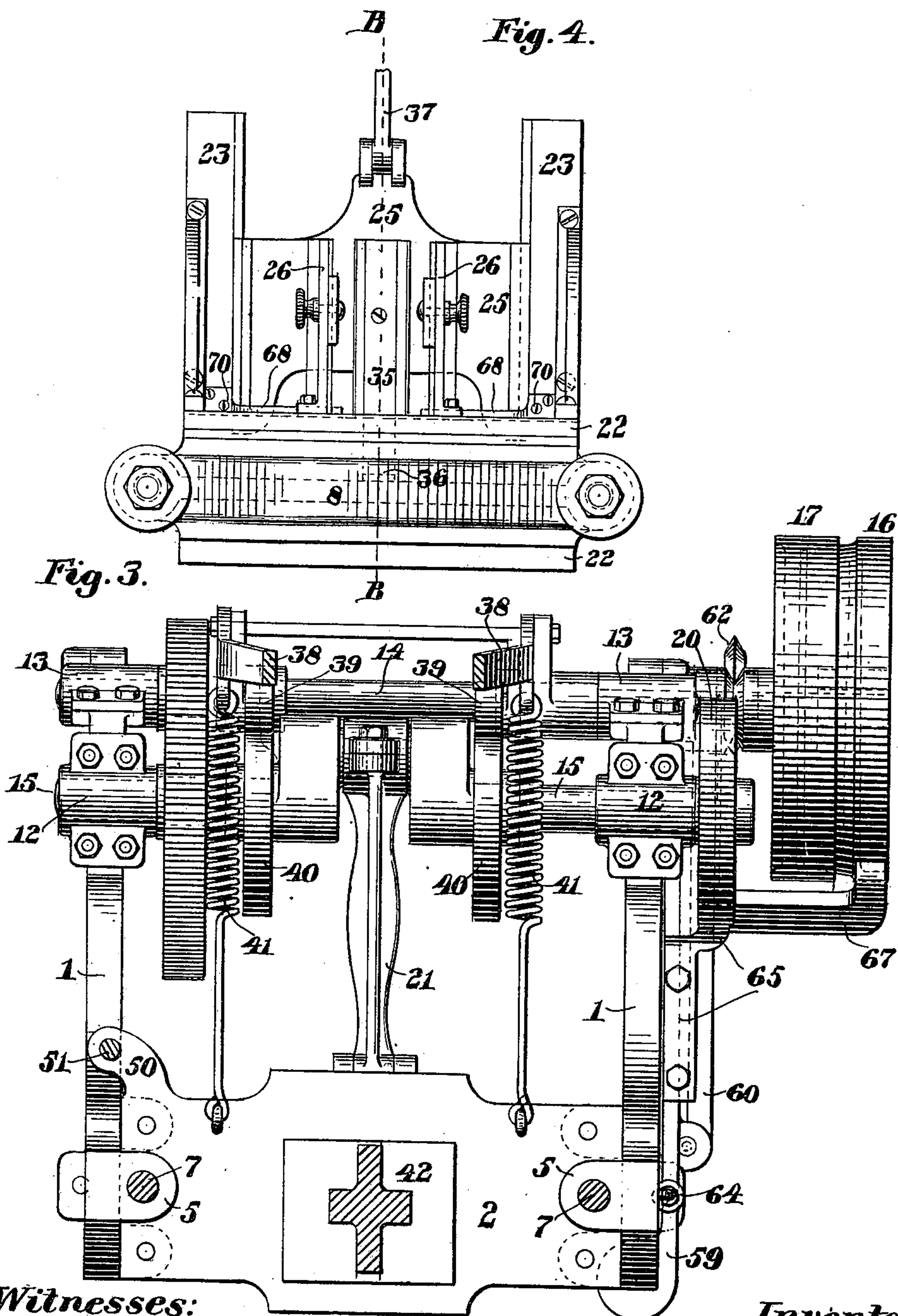
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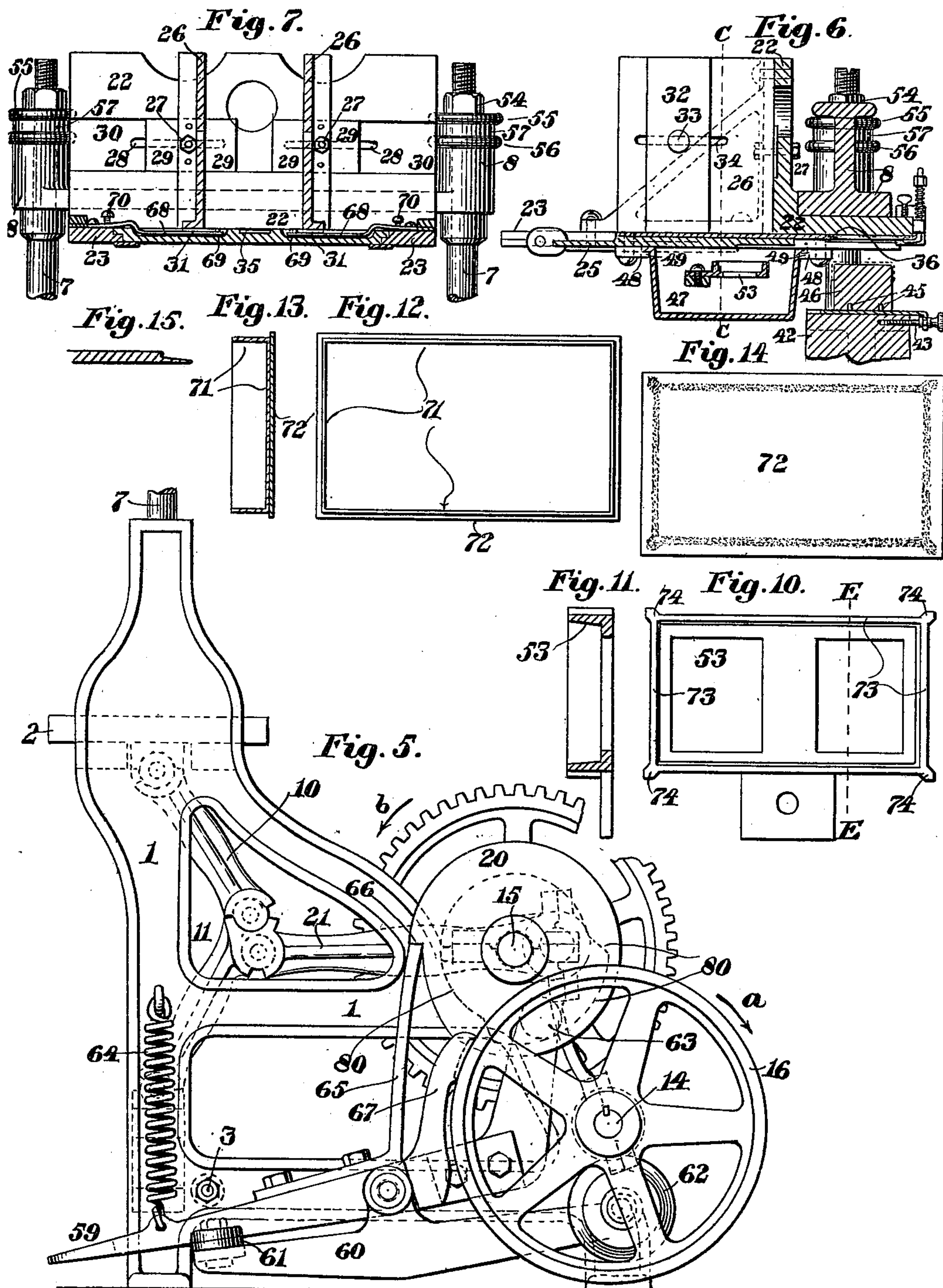
A. E. STINEHOUR.

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(No Model.)

(Application filed Jan. 9, 1901.)

4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

ALONZO E. STINEHOUR, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR OF
ONE-HALF TO JOSEPH A. WOLCOTT, OF SAME PLACE.

MACHINE FOR APPLYING BOTTOMS TO PASTEBOARD BOXES.

SPECIFICATION forming part of Letters Patent No. 672,020, dated April 16, 1901.

Application filed January 9, 1901. Serial No. 42,646. (No model.)

To all whom it may concern:

Be it known that I, ALONZO E. STINEHOUR, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain
5 new and useful Improvements in Machines for Applying Supplementary Bottoms to Pasteboard Boxes, of which the following, taken in connection with the accompanying drawings, is a specification.

10 My invention relates to machines for applying supplementary bottoms to pasteboard boxes; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the
15 accompanying drawings and to the claims hereto appended and in which my invention is clearly pointed out.

Figure 1 of the drawings is a front elevation of a machine embodying my invention.
20 Fig. 2 is an elevation of the left side of the machine. Fig. 3 is a sectional plan of the same, the cutting-plane being on line A A on Fig. 1. Fig. 4 is a plan of the cross-head and
25 the parts carried thereby. Fig. 5 is a partial elevation of the right side of the machine, the cross-head and the parts carried thereby being broken away. Fig. 6 is a partial sectional elevation of the upper portion of the
30 machine, the cutting-plane being on line B B on Fig. 4. Fig. 7 is a section on line C C on Fig. 6 with the paste-tank and pasting-die removed. Fig. 8 is a plan of one of the bottom-supporting plates 31, drawn to an enlarged scale. Fig. 9 is a transverse section
35 on line D D on Fig. 8. Fig. 10 is a plan of the paste-applying die. Fig. 11 is a transverse section of the same on line E E on Fig. 10. Figs. 12 and 13 are respectively a plan
40 and a transverse section of a pasteboard box with the supplementary bottom secured thereto. Fig. 14 is a plan of the supplementary bottom, showing in dotted shading the outline of the paste applied thereto to secure it
45 to the box proper. Fig. 15 is a longitudinal section of a portion of the front end of the feed-plate, drawn to an enlarged scale.

Many paper or pasteboard boxes are made with bottoms that project beyond the outer
50 vertical surfaces of the walls of said boxes, which are ordinarily produced by securing

supplementary bottoms in the form of rectangular pieces of pasteboard to the bottoms of ordinary paper or pasteboard boxes, said supplementary bottoms having lengths and
55 breadths somewhat greater than the lengths and breadths of said boxes.

The object of my invention is to facilitate the applying of said supplementary bottoms to said boxes, and to this end I have constructed the machine illustrated in the accompanying drawings, in which 1 1 represent
60 the two side frames of the machine, connected together by the bed-plate 2 and the tie-rods 3 and 4, as shown. The frames 1 1 are each provided with the inwardly-projecting ears 5
65 and 6, in bearings in which are fitted so as to be freely movable vertically therein the two upright rods 7 7, having firmly secured upon their upper ends the cross-head 8 and on their
70 lower ends the cross-tail 9, said cross-tail being connected to the under side of the bed-plate 2 by a pair of toggle-links 10 and 11.

The frames 1 1 are provided with the bearing-boxes 12 and 13, in which are mounted
75 the driving-shaft 14 and the crank-shaft 15, respectively, as shown. The shaft 14 has mounted on one end thereof, outside of the frame 1, tight and loose pulleys 16 and 17, respectively, and on its other end, just inside of the frame 1, the spur-pinion 18, the
80 teeth of which engage the teeth of the spur gear-wheel 19, firmly secured to the crank-shaft 15, said shaft 15 having secured upon its opposite end the cam and locking-disk 20,
85 as shown in Figs. 1, 2, and 3. The crank of the shaft 15 has mounted thereon one end of the connecting-rod 21, the opposite end of which is connected to the toggle-links 10 and
90 11, as shown in Figs. 2 and 3.

The cross-head 8 has secured thereto, so as to be movable vertically therewith, the angle-iron 22, the upright portion of which forms the front wall of a hopper to receive a pile
95 of bottoms, and also has secured thereto the front ends of two rearwardly-projecting bars 23, the inner edges of which are rabbeted to form guiding-bearings for the feed-plunger
25, as shown in Figs. 1, 2, 6, and 7. The upright plate of the angle-iron 22 has adjust-
100 ably secured to its rear face the two vertical plates 26, which form the sides of the bottom-

receiving hopper and are movable toward and from each other to adapt the width of the hopper to the length of the bottom-blank, they being secured to said angle-iron 22 by means of the bolts 27, which pass through horizontal slots 28, formed in the angle-iron 22, said hopper-plates 26 having formed upon or secured to their front vertical edges the laterally-projecting thin plate-like ears 29, which are fitted to a shallow groove 30, formed in the rear face of the upright portion of the angle-iron 22, so as to maintain said hopper-plates 26 in upright positions and permit them to be readily adjusted toward and from each other by simply slackening a single bolt in each, moving said plates, and tightening said bolts again. The lower edges of the hopper-plates 26 have each secured thereto the thin metal plate 31, which project beyond the front edges of said plates 26 to the front edge of the horizontal portion of the angle-iron 22 and have their inner edges rabbeted to a depth equal to the thickness of the rectangular pieces of pasteboard which form the supplementary bottoms to be secured to the boxes, a pile of which are to be placed in said hopper, with their ends supported by the inner rabbeted portions of the plates 31, which project beyond the inner vertical surfaces of said hopper-plates 26, the upper surfaces of the rabbeted portions of the plates 31 being arranged just sufficiently below the under surface of the horizontal portion of the angle-iron 22 to permit the lower blank in the pile in the hopper to be fed forward beneath said angle-iron without disturbing those blanks above the bottom one. The inner vertical faces of the hopper-plates 26 have adjustably secured thereto the gage-plates 32, the lower ends of which rest upon the projecting lips of the plates 31 and are secured to said plates 26 by the screw-bolts 33, which pass through the horizontal slots 34, formed in said plates 26, as shown in Figs. 2, 4, and 6.

The feed-plunger 25 has secured to its upper side and central of its width the steel feed-blade 35, provided near its front end with the shoulder 36, to engage the lower blank of the pile in the hopper to feed it forward, and with a short forward extension beyond said shoulder, the upper surface of which is inclined to insure its passage beneath said blank without disturbing the same until said shoulder comes in contact therewith. The near end of the plunger 25 is connected by the link 37 to the upper end of a lever 38, made, preferably, in two parts, each pivoted at its lower end upon the shaft 14, and each arm of said lever carries a truck 39, which is engaged by a cam 40 to move said plunger to the rear against the tensions of the springs 41, secured at one end to said lever and at the other end to the bed-plate 2 or to any other suitable fixed portion of the machine, the reaction of which springs serves to move said plunger toward the front and feed a blank

from the hopper to a position beneath the cross-head 8 or the angle-iron 22, secured thereto.

The bed-plate 2 has firmly secured to its upper side the standard 42, having fitted to a shallow groove formed in its upper end, so as to be movable toward and from the rear by means of the adjusting-screw 43, the plate 44, having set therein two upwardly-projecting pins 45, which enter holes in the box-holding block 46, which has a length and width to fit the interior of the box to which the supplementary bottom is to be attached, said block 46 being removed and another substituted therefor when a different-sized box is to have the supplementary bottom secured thereto.

A paste-tank 47 is attached to the under sides of the bars 23 by means of the swiveling buttons 48, two in front and two in the rear, which engage outwardly-projecting flanges 49, formed on the front and rear sides of said tank, as shown in Figs. 1, 2, and 6, by which construction and arrangement the paste-tank may be readily removed for cleaning and replaced by simply turning said buttons about their pivotal axes.

The bed-plate 2 has formed in one piece therewith or secured thereto near its left end and at its rear side the arm or bracket 50, in which is set the vertical rod 51, having adjustably secured thereon near its upper end the bar 52, which projects inward over the left end of said paste-tank, then downward, and again inward, as shown in dotted lines in Fig. 1, and has secured to its inner end the paste-applying die 53, as shown in dotted line in Fig. 2 and in full lines in Figs. 6, 10, and 11.

The upper end of each of the rods 7 has fitted thereon, between the end of the cross-head 8 and the nut 54, two metal washers 55 and 56, and between said washers a cushion of rubber 57, as shown in Figs. 1, 2, 6, and 7, whereby the cross-head is rendered slightly yielding to compensate for slight variations in the thickness of the pieces of pasteboard which form the supplementary bottoms for the boxes.

On a stud 58, set in the right-hand frame 1, is mounted the treadle-lever 59 and the shipper-lever 60, the front end of the lever 60 being connected to the lever 59 by a suitable clamping-bolt, with a cushion of rubber 61 between them, as shown in Figs. 2 and 3. The rear end of the lever 60 has mounted upon a suitable stud set therein the shipper-truck 62, the periphery of which is V-shaped and engages the conical surfaces formed on the contiguous ends of a hub fixed on the shaft 14 and the hub of the loose pulley 17 to force said pulley 17 into frictional contact with the tight pulley 16 in a well-known manner. The treadle-lever 59 extends to the rear from its fulcrum and upward and carries at its rear end the cam-truck 63, which is acted upon by the cam-surface 80, formed in the inner face of the disk 20, to hold said lever

in the position with its front end depressed after the operator removes his foot from the treadle until the proper time, when said cam releases said lever and allows the reaction of the spring 64 to raise the front end of the levers 59 and 60, thereby permitting the loose pulley 17 to be moved from contact with the tight pulley 16, and the movements of the machine are arrested just when the toggle has assumed the position shown in Fig. 2 and the cross-head, with all the parts carried thereby, has been raised and the block 46 is so relieved from the vertically-movable mechanism that the box thereon may be readily removed and another placed thereon. The lever 59 has secured thereon and movable therewith the upwardly-projecting arm 65, the upper end of which engages the shoulder 66, formed in the periphery of the disk 20, to lock said disk against revolution until the lever 59 is again depressed, when said arm 65 is disengaged from the shoulder 66 and the brake-shoe from the pulley 16. The lever 59 also has secured thereto and movable therewith the laterally and upwardly projecting arm 67, the upper end of which contacts with the periphery of the tight pulley 16 to check the momentum of the driving-shaft when the loose pulley is released from frictional contact with said tight pulley.

Each of the bars 23 has secured to its upper side, just in the rear of and in close proximity to the rear vertical face of the angle-iron 22, the spring-arm 68, which projects inward substantially parallel to said rear face of the angle-iron, but slightly below the lower horizontal face of said angle-iron, and has set therein, near its inner end, the upwardly-projecting pin 69, the upper end of which presses against the under surface of the lower pasteboard blank contained in the hopper to hold it in the proper position to insure its being fed forward when the plunger 25 is moved to the extreme of its forward movement, said spring-arm being provided with the adjusting-screw 70, by which the level of the upper end of said pin 69 may be varied to suit the conditions of different cases, all as shown in Figs. 1, 4, and 7.

In Figs. 12 and 13 is shown the box 71, with the supplementary bottom 72 secured thereto.

The paste-applying die 53 is provided with the raised ribs 73, extending along each side and end, and at each corner with oblique extensions 74, (see Fig. 10,) the upper edges of said ribs and corner extensions forming the paste-applying surface, which comes in contact with the under surface of the lower piece of pasteboard contained in the hopper when the cross-head and the parts carried thereby are moved downward, while the pasting-die remains stationary and leaves an impression in paste thereon, as indicated by the shaded figure 75 in dotted lines on Fig. 14.

The front edge of the horizontal portion of the angle-iron 22 has adjustably secured thereto by suitable binding-screws two clamp-like stands 76, in each of which is mounted

a vertical rod 77, having its lower end bent at right angles to serve as a button and its upper end screw-threaded and provided with the adjustable nut 78 and surrounded between its bearing and said nut by a coiled spring 79, which acts to press said rod upward, the button portion below its bearing being arranged to be turned under the front end of the plate 31 and hold it with a yielding pressure against the under surface of the horizontal portion of the angle-iron 22, as shown in Figs. 1 and 4.

The operation of my invention is as follows: The several parts of the machine being in the positions shown in Figs. 1, 2, and 3, the paste-tank 47 being charged with paste, the hopper with a pile of the supplementary bottoms and a suitable box-receiving block 46 being placed in the proper position on the standard 42, the operator places a box-body 71, without a supplementary bottom, upon said block, as indicated by dotted lines in Fig. 6, then places his foot upon the treadle-lever 59 to depress its front end and the front end of the shipper-lever 60, thereby disengaging the locking-arm 65 from the shoulder 66 of the disk 20, the brake-arm 67 from contact with the pulley 16, and causing the shipper-truck 62 to engage the conical end of the hub of the loose pulley 17 to move it into frictional contact with the pulley 16, thereby causing the shaft 14 to be revolved in the direction indicated by the arrows *a* and the crank-shaft 15 in the direction indicated by the arrows *b*, both in Figs. 2 and 3. The depression of the front end of the lever 59 causes the truck 63 to be moved obliquely upward into a position to be engaged by the portion of the cam 80 formed in the disk 20, having the smallest radius, which serves to hold said lever in its depressed position after the operator has removed his foot from the treadle until the crank-shaft has made about three-fourths of a revolution and the smaller part of the said cam has passed from beneath said truck, when the reaction of the spring 64 returns said treadle-lever 59 to the position shown in the drawings. The shaft 14 continues to revolve after the front ends of levers 59 and 60 have been raised by the action of said spring 64 until the shoulder 66 on the disk 20 comes in contact with the upper end of the locking-arm 65, when the motions of said shafts are arrested. The first effects produced by the movement of the crank-shaft 15 in the direction indicated by the arrow *b* is to move the center of the toggle 10 11 toward the front of the machine, thereby moving the cross-tail, the cross-head 8, and all the parts carried thereby downward, and at the same time by the action of the cams 40 upon the trucks 39, carried by the lever 38, the feed-plunger 25 and feed-plate 35 are moved to their extreme rearward positions. When the cross-head has descended to its lowest position, the under surface of the angle-iron 22 comes in contact with the box on the block 46 or with the supplementary

bottom resting thereon, and if said bottom has been pasted will secure it to said box. In beginning work, however, there would be no supplementary bottom pasted and in position to be acted upon when said cross-head is depressed the first time; but such depression carries the paste-tank downward, so as to uncover the pasting-die 53, with which the lower piece of pasteboard in the hopper comes in contact and receives an impression of paste, as indicated by the shaded outline on Fig. 14. A continuation of the revolution of the shaft 15 causes the toggle to be broken, and the cross-head and the parts carried thereby are moved to their uppermost positions and during the same time the feed-plunger and plate are moved forward, the shoulder 36 on said plate coming in contact with the edge of the lower pasteboard in the hopper and feeding it forward beneath the angle-iron 22 into a position directly above the box on the block 46, with its ends resting on the narrow rabbeted edge of the plates 31, when the rotation of the shaft 15 is arrested, as above described, and the operator removes the box on the block 46 if a supplementary bottom has been previously secured thereto and places thereon another box 71. He then again depresses the treadle-lever, and the next revolution of the shaft 15 causes a repetition of the movements described, and the previously-pasted supplementary bottom is pressed firmly into contact with the box on the block 46 and is firmly cemented thereto.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a machine for applying supplementary bottoms to pasteboard boxes, the combination of the fixed standard 42 provided with a shallow groove in its upper end extending from front to rear; a plate fitted to said groove and provided with two upwardly-projecting pins; a solid rectangular box-supporting block provided with holes to receive said pins and resting upon said plate and standard; and means for adjusting said plate and block toward and from the front of said standard.

2. In a machine for applying supplementary bottoms to pasteboard boxes, a hopper to receive a pile of rectangular pieces of pasteboard, comprising a fixed front wall, two-sided plates adjustably secured to said front wall and forming the end walls, and two gage-plates adjustably secured to said end plates, and forming the rear side of said hopper.

3. In a box-bottoming machine, a hopper comprising the front plate 22 provided with a shallow groove in its rear face; the two end wall-plates 26, each provided with the thin plates 29, extending transversely of the front edges of said wall-plates and fitting into said groove; the gage-plates 32 adjustably secured one to each of the wall-plates 26, means for adjusting said end wall-plates toward and from each other; and a thin rabbeted plate 31 secured to the lower edge of each of said end wall-plates and extending beyond the

rear face of the front wall of said hopper toward the front of the machine as set forth.

4. In a box-bottoming machine the combination of a vertically-movable cross-head; an expansible hopper carried by and movable vertically with said cross-head, and adapted to hold a pile of rectangular pieces of pasteboard; an inwardly-projecting lip secured to the under edge of each end wall-plate of said hopper, with its upper surface at a distance below the lower edge of the front wall of said hopper slightly greater than the thickness of the lower pasteboard in said hopper, and extending toward the front of the cross-head beneath the front wall of the hopper; the plunger 25; the feed-plate 35 carried by said plunger and provided with the shoulder 36; the lever 38; the link 37 connecting the upper end of the lever 38 to the plunger 25; suitable cams constructed and arranged to act upon said lever to move it about its fulcrum in one direction; a spring for moving said lever in the opposite direction; a box supporting block or anvil loosely mounted upon a fixed portion of the machine; and means for adjusting said block toward and from the front of the machine.

5. In a box-bottoming machine, the combination of a vertically-movable cross-head; an expansible hopper connected to and movable vertically with said cross-head; an inwardly-projecting lip extending inward from each end wall-plate with its upper surface slightly below the level of the under surface of the front wall of said hopper; a reciprocating feed-plate provided, with an inclined front section to pass beneath the lower pasteboard in said hopper, and a shoulder to engage the rear edge of said lower pasteboard to feed it forward; the two rabbeted bars 23 connected to and movable vertically with said cross-head and forming guideways for the feed-plunger; and a light spring-arm secured to each of said bars 23, just in the rear of the front wall of said hopper and extending inward beneath the end walls of said hopper, and provided at its free end with an upwardly-projecting pin 69 to press against the under surface of the lower pasteboard in said hopper as it is being fed forward.

6. In a box-bottoming machine, the combination of the following elements viz: a driving-shaft; a friction-driving mechanism comprising a tight and loose pulley; a spur-pinion mounted on said driving-shaft; the crank-shaft 15; the spur-gear wheel 19; the bed-plate 2; the cross-head 8; the cross-tail 9; the toggle-links 10 and 11; the connecting-rod 21 connecting the crank-shaft with the toggle; the rods 7 connecting said cross-head and cross-tail; an expansible hopper and a feed-plate carried by and movable vertically with said cross-head; the lever 38; a cam for moving said lever in one direction; a spring for moving it in the opposite direction; a link connecting the movable end of said lever to the feed-plunger; the cam-disk

20 provided with an internal cam-surface 80,
and with a radial shoulder 66; the treadle-
lever 59; the cam-truck 63 carried by the rear
5 end of said lever and engaged by said cam-
surface; the locking-arm 65 and the brake-
shoe 67, both carried by said lever 59; the
shipper-lever 60 mounted upon the same axis
as said lever 59, and connected at its front
end to said treadle-lever 59, a yield-cushion
10 61 between said two levers; and the shipper-

roll 62, all constructed, arranged and oper-
ating substantially as described.

In testimony whereof I have signed my
name to this specification, in the presence of
two subscribing witnesses, on this 8th day of 15
January, A. D. 1901.

ALONZO E. STINEHOUR.

Witnesses:

N. C. LOMBARD,
A. E. HOUGHTON.