

(No Model.)

4 Sheets—Sheet 1.

H. W. BECHT.
BOX NAILING MACHINE.

No. 553,094.

Patented Jan. 14, 1896.

Fig. 6.

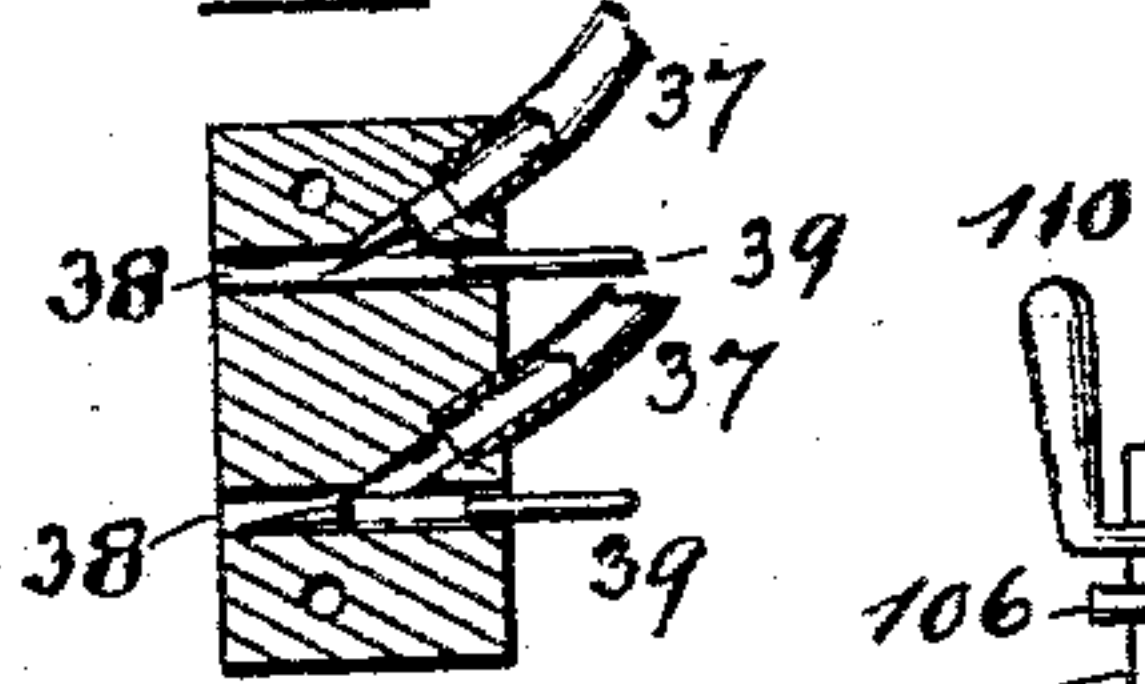


Fig. 10.

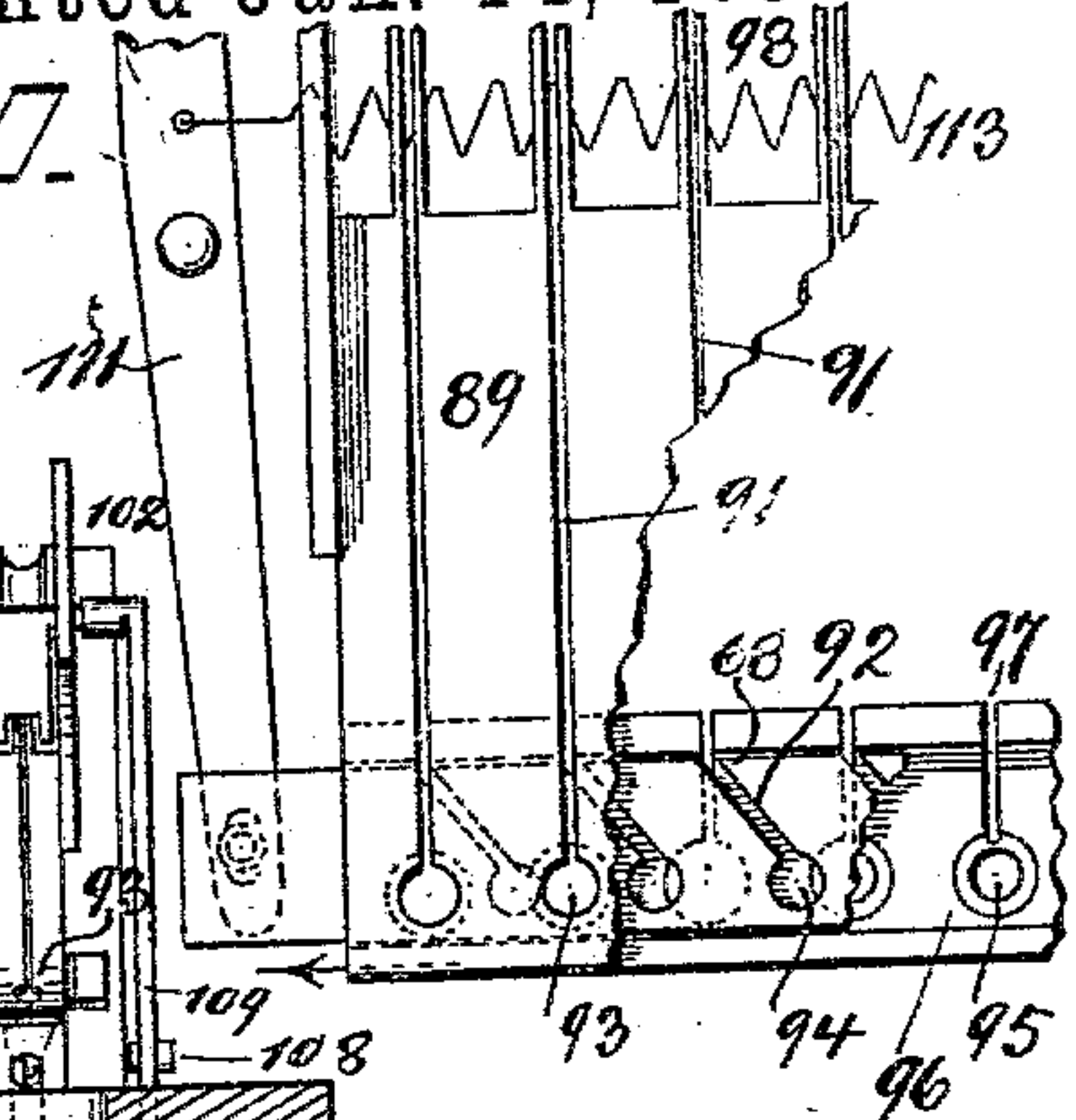
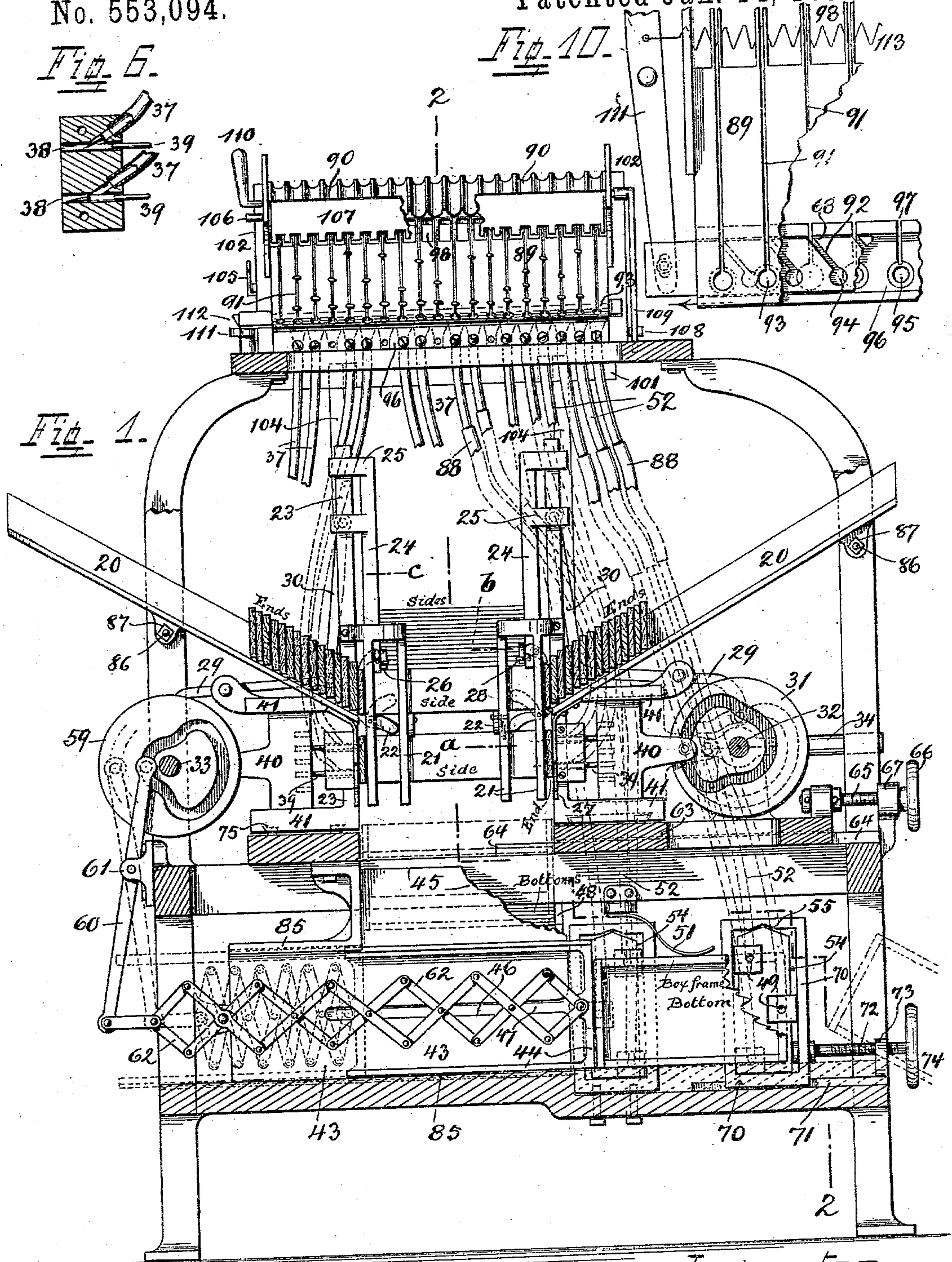


Fig. 1.



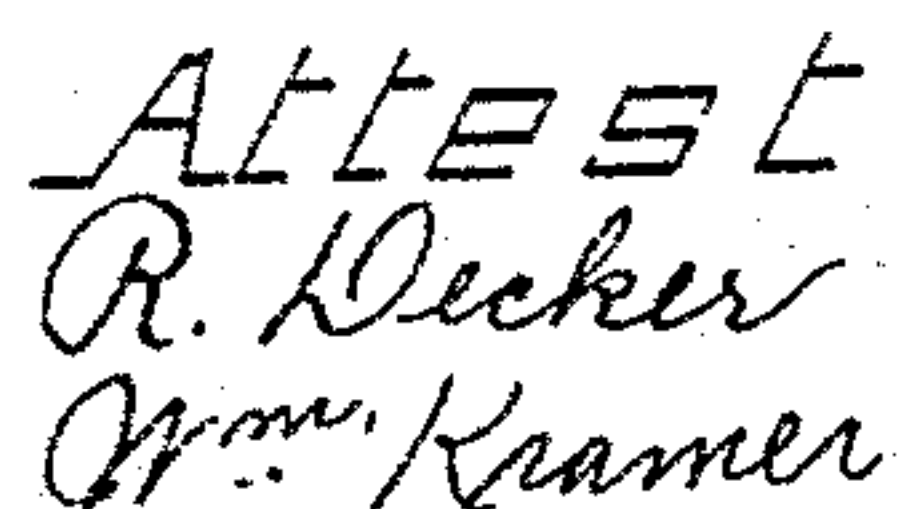
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by C. Spengel Atty.

4 Sheets—Sheet 2.

No. 553,094.

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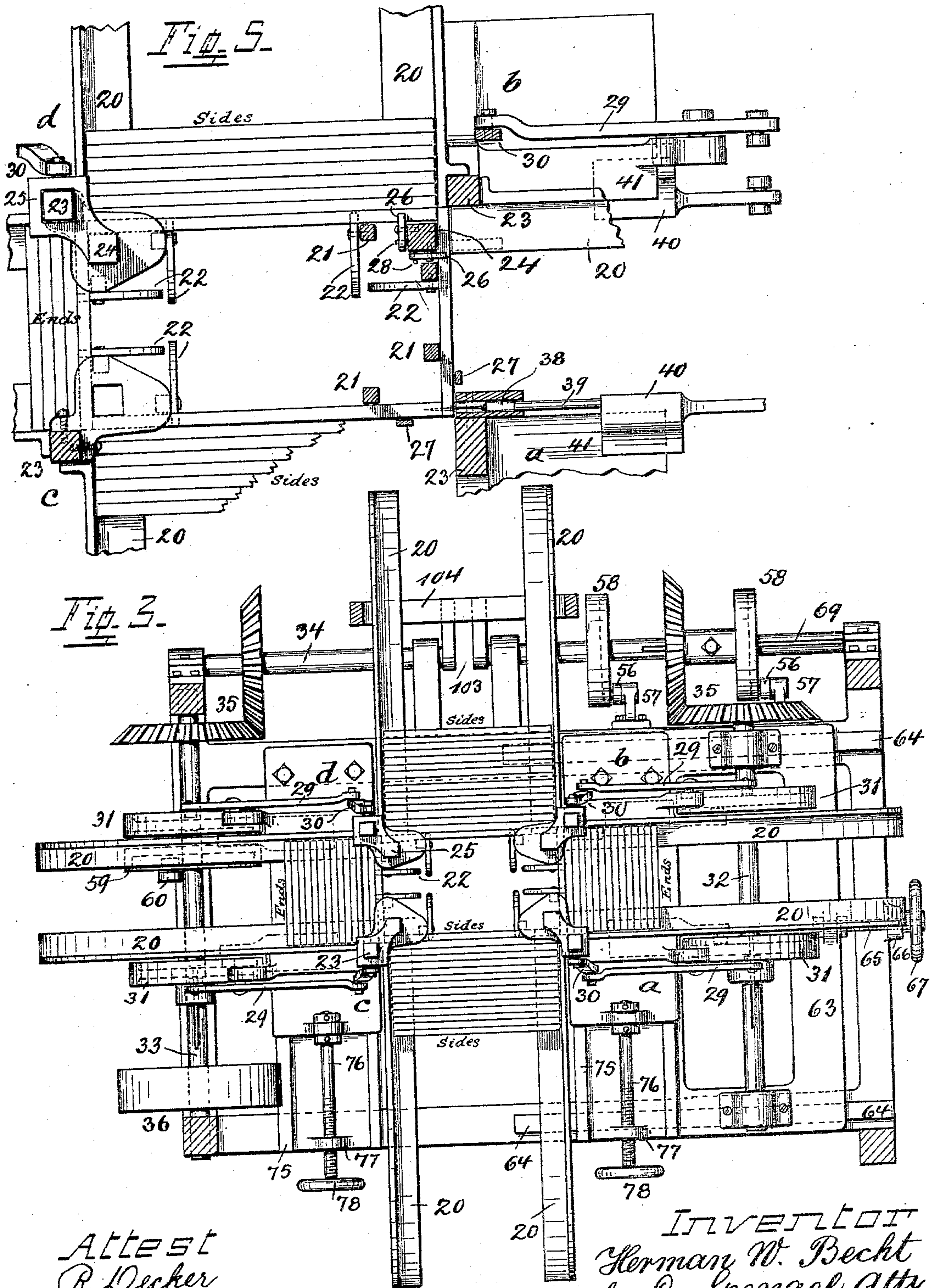
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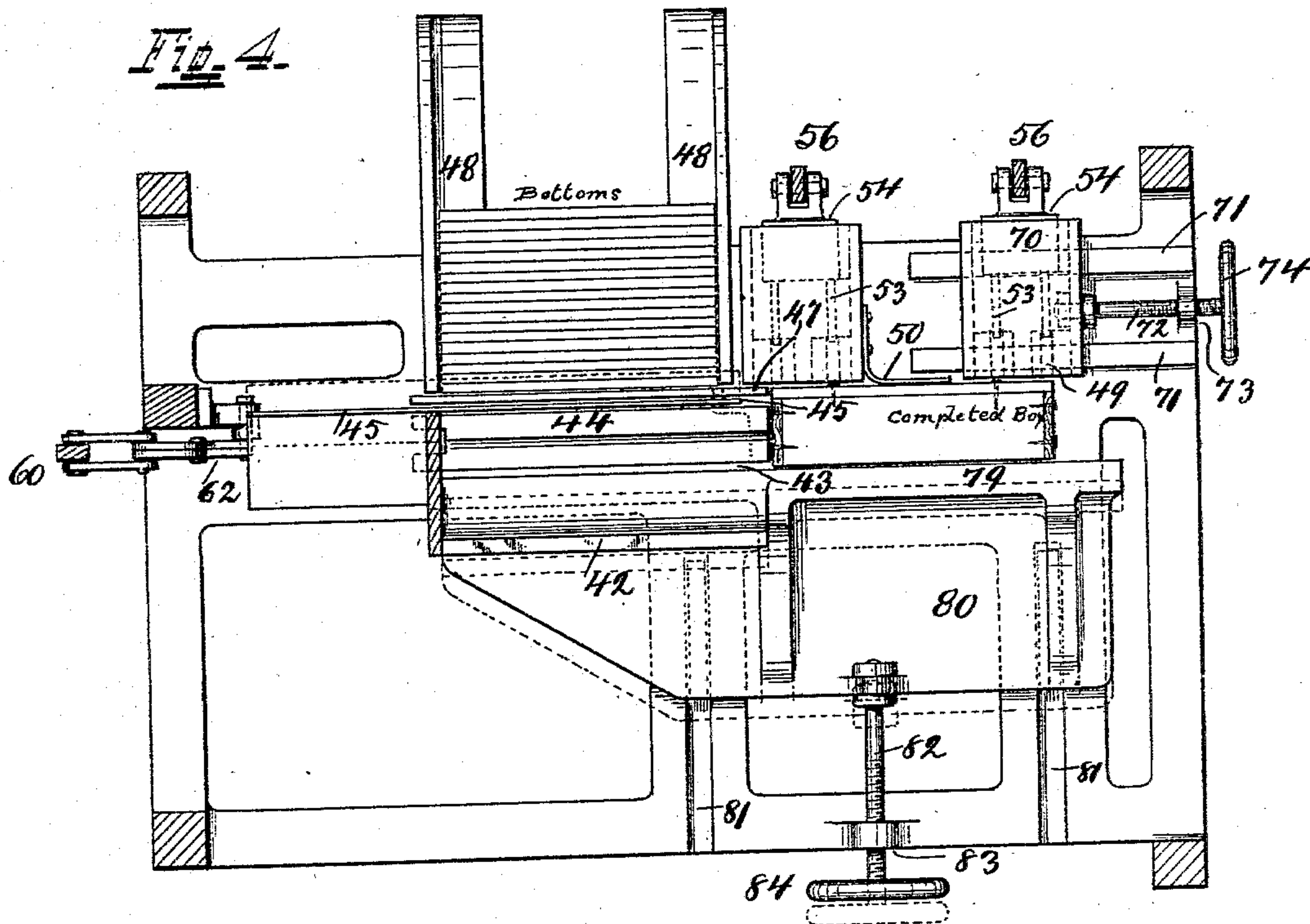
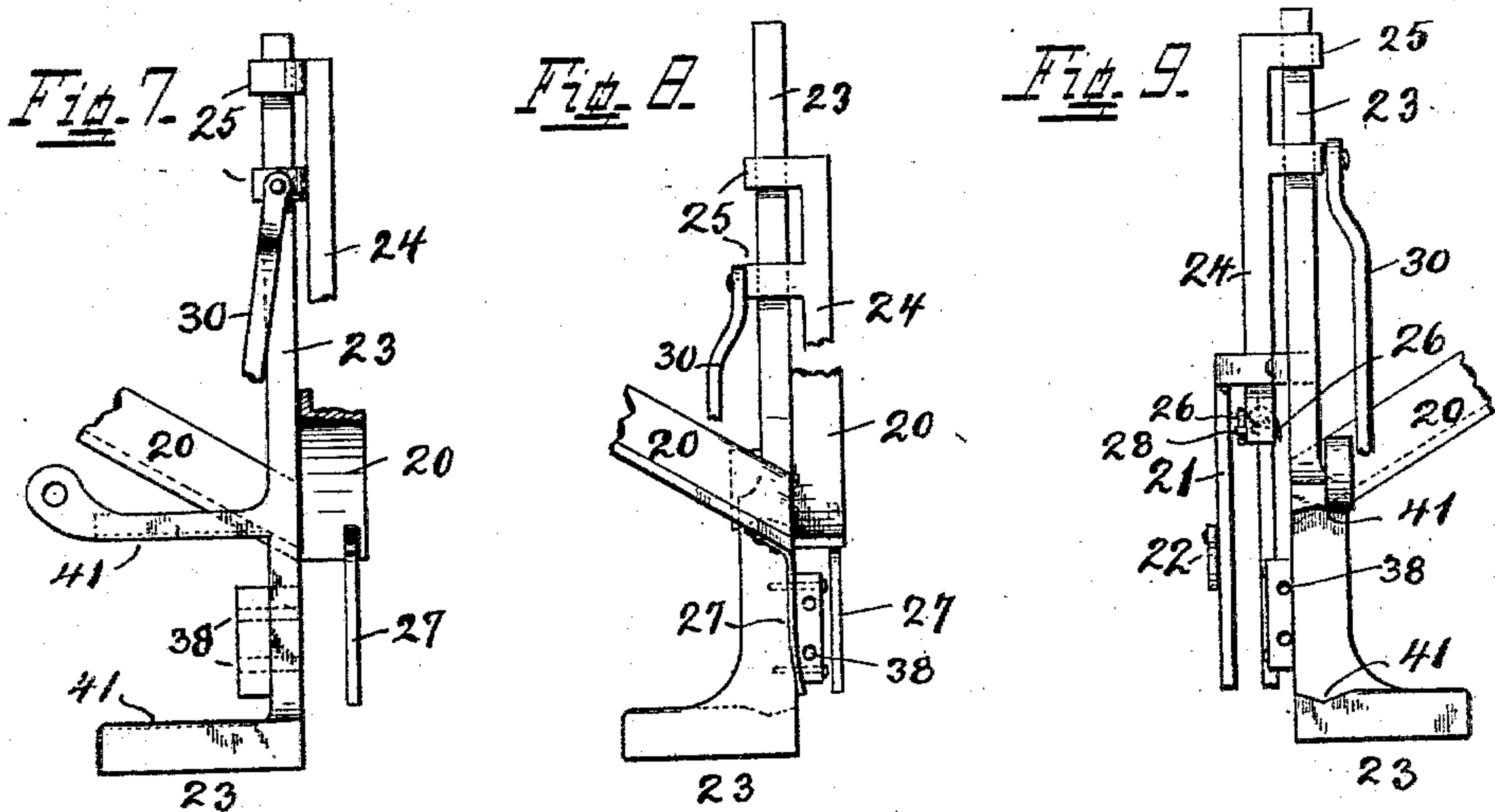
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UNITED STATES PATENT OFFICE.

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BOX-NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 553,094, dated January 14, 1896.

Application filed June 23, 1894. Serial No. 515,456. (No model.)

To all whom it may concern:

Be it known that I, HERMAN W. BECHT, a citizen of the United States, and a resident of Cincinnati, Hamilton county, State of Ohio, have invented a certain new and useful Box-Nailing Machine; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, attention being called to the accompanying drawings, with the reference letters and numerals marked thereon, which form a part of this specification.

This invention relates to machines for nailing boxes of all sizes for packing and shipping purposes. It is best adapted, however, for constructing boxes of smaller sizes—like cigar-boxes, for instance—the object being to assemble by suitably-constructed machinery all the parts required, lid excepted, which make up the boxes, and nail them together after that. At the same time provision is made for adjustment to permit the nailing of boxes of different sizes.

In the following specification, and particularly pointed out in the claims, is found a full description of my invention, its operation, parts, and construction, the latter being also illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of the machine, taken on line 1 1 of Fig. 2. Fig. 2 is a vertical cross-section on line 2 2 of Fig. 1. Fig. 3 is a horizontal section and top view of parts above the bed-plate. Fig. 4 is a similar view showing parts below the bed-plate. Fig. 5 is an enlarged top view and horizontal section of the central part of the machine, the line of view or section being taken at different heights, which are indicated by letters *a*, *b*, and *c* in Fig. 1, which letters are correspondingly placed in Fig. 5. Fig. 6 is an enlarged sectional detail view of the construction, whereby the nail is placed in position to be driven. Figs. 7, 8, and 9 are different elevations of a feed and nailing device with accessory parts, different ones being shown in each elevation in place of others which are omitted. Fig. 10 is an enlarged front view showing a part of the nail-supplying device. Fig. 11 is a complete rear view of the same.

All the parts of the box—that is, the four sides and the bottom—are supplied cut to their proper sizes. The machine assembles first four of these sides to make a box-frame without the bottom. These four sides are next nailed together. The completed frame is then advanced and brought in proper position to receive the bottom, which is finally nailed on and the box completed.

To this end the machine consists of devices whereby the sides are assembled, of devices whereby they are nailed together, of a device whereby the box-frame and the bottom are brought together, of devices which nail the latter to the former, and of a general nail-feed device whereby the nailing devices are supplied with the nails.

The machine is adapted to construct frames only without bottoms, which latter may be put on by other means, or by hand; but this bottom-nailing portion is preferably made a part of the whole.

The sides are received by four inclined chutes 20, into which they are put in an upright position. These chutes have no complete bottoms, the box sides being only supported near their ends, which is sufficient, and whereby the width of the chute becomes adjustable and all unnecessary friction is obviated and the sides are caused to freely slide down. The lowest parts of all the chutes are at the same height which brings the lowest side in each chute to a corresponding position and to the same height with the remaining sides. They are held back in the chutes by upright guides 21, which are so set that when the four lowest sides are lying against these guides the joint ends of the sides are in contact with each other and in a position they relatively occupy in the completed box. Between the lower end of the chutes and between them and guides 21 thereat there is a space of sufficient width to permit the lowest side in a chute to leave the latter and pass edgewise down on the guides into this space. Normally, however, such passage is prevented by pawls 22, which are pivotally connected to guides 21 and reach into this space mentioned. Thereby the lowest side of each inclined stack, after leaving the chute proper, passes upon these pawls and rests thereon.

23 are four standards serving as guides for

feed-bars 24 held to them by slides 25, whereby they become capable of a vertically-reciprocating motion. They also support guides 21, which are connected to them by brackets, as shown. At the lower end these feed-bars carry pawls 26, which are so located thereon as to extend over the upper edge of the lowest side in each stack, whereby as a consequence they engage said sides when moving downwardly and carry them with them. Pawls 22 readily yield to the positive pressure of the feed-bars and clear the space for the advancing sides, dropping back again to their normal position as soon as these latter have passed below them. The return of these pawls may be effected by springs or gravitation, but preferably the latter method is used, as shown, for which purpose the outer part of the pawls is made sufficiently heavy to raise up the inner part and also carry the weight of the side which it temporarily supports. It is needless to say that the downward motion of all the feed-bars starts and terminates at the same time and they all stop at the same height, so that the four sides which have been pushed down together are still in the same relative position and ready for nailing. They are held in such position by upright guides 21 and springs 27 holding them against the former. Meanwhile the weight of the stack of sides has caused another side to slide into the place of the one just pushed down, such side now occupying the same position as the other one, lying against the guides and being held up by pawls 22. At the same time the feed-bar commences to rise again to be ready for the next operation, pawls 26 swinging readily out of the way, after which they drop again to their normal position and on pins 28, which hold them stiff during the first part of their movement when they push the sides down. The reciprocating motion of the feed-bars is accomplished by levers 29, connected to them by links 30 and actuated by grooved cams 31. These latter are rotated by shafts 32 33, which rotate together, being operatively connected by another shaft 34 and bevel-gear wheels 35.

33 may preferably constitute the driving-shaft, for which purpose it carries a driving-pulley 36. The nails are usually driven in through the ends or shorter sides and into the longer sides of the box, for which purpose the shorter sides overlap the ends of the longer sides.

The nails pass down point first through chutes 37 into hammer-ways 38, which terminate opposite the short sides and at the proper points thereat to reach the edge of the long sides, as is shown in the drawings. The speed which they attain carries them readily through the horizontal part of the hammer-ways, into which they drop, their points against the sides to be nailed. (See Fig. 6.) The rear part of the hammer-way is occupied by hammers 39, which are affixed to slides 40, moving in guides 41 and reciprocated by grooved cams 31. These grooves are in the

other side and differently shaped from the grooves which actuate levers 29, the object of such difference being to cause the nailing to proceed at the proper time—that is, when the feed-bars have pushed the four sides to the proper position with reference to the hammer-ways and when said sides have stopped moving and the feed-bars are starting on their upward stroke. The cams now cause slides 40 to move inwardly, whereby the hammers pass clear through the hammer-ways and against the box ends, driving the nails in front of them into the latter. In place of one cam with a groove in each side, two different cams, side by side, each with one groove, may be used. For higher boxes, requiring three nails, the castings containing the hammer-ways may be detachable and exchanged for such having the required number of ways. Slides 40 are high enough to admit additional hammers to be inserted. By the time the nails have been driven another set of four sides is being pushed down by the feed-bars, occupying the place of the set previously nailed, which latter set, now forming a frame, is thereby pushed out and disengaged from between guides 21 and springs 27. The disengaged frame drops onto a partition 42 in such a manner as to be tilted, (see Fig. 2,) and is thereby caused to drop edgewise into a receiver 43, the width of which corresponds with the thickness or height of the frame.

44 is a driver reciprocating in a manner so as to traverse the receiver through its entire length. At the time when the box-frame drops the driver has retreated, so as to permit the former to drop in front of it and be within its path. One of the walls of the receiver, designated by 45, is very thin, preferably of sheet metal, and slotted at 46 to permit a connection between the frame-driver 44 and a supplementary driver 47, which is at the other side of wall 45 and of even height with the first driver. Against this wall 45 terminates a chute 48, which supplies the bottoms, the lowest one of which rests always against this wall and is in front of the supplementary driver. This latter is about of even thickness with the bottoms for the boxes, and by reason of the sides of the chute stopping short of wall 45 by a distance which is equal to this thickness, the supplementary or bottom driver is enabled to traverse and pass the discharge end of the chute 48. The effect of this construction is that the frame and bottom drivers, by reason of their connection reaching through slot 46, move together, one on one side of wall 45 passing through recess 43, the other on the other side thereof passing across the discharge end of chute 48; and, further, the front ends or faces of the drivers being in line, it follows that the box-frame in front of the one driver and the lowest bottom in the chute are advanced simultaneously. At the proper time the motion of the drivers stops, at which time the frame with the bottom in proper position thereon has arrived opposite

the hammer-ways 49, which are so disposed in groups that the nails therein when driven pass through the bottom into the edges of the sides, one nail in each group passing into each of the long sides and one into each short side. Wall 45 terminates before the first group of hammer-ways is reached, so that by the time the box-frame and bottom are in position to be nailed they are in direct contact with each other. This contact is completed by springs 50, which press the bottom against the frame, while another spring 51 holds the frame down in position.

Nail-chutes 52 supply the nails, point first, the same as first explained, they dropping into the hammer-ways in front of hammers 53, carried by slides 54, which reciprocate in guides 55. Slides 54 are moved each by a lever 56, pivoted at 57 and carrying a roller at its other end, which occupies a groove in a cam 58. There are two of these cams and levers, one for each one of slides 54 and for each group of hammer-ways. These cams 58 sit on shaft 34 and the grooves thereon are so shaped as to cause the hammers to operate, for the purpose of nailing the bottom on, at the time when frame and bottom have arrived in the proper position and when their drivers 44 and 47 are starting on their return stroke. The motion of these latter is obtained from a grooved cam 59 on shaft 33, which operates a lever 60, pivoted at 61 and connected to driver 44 by means of a series of toggle-joints 62. Driver 47 is connected to and carried by driver 44, as already explained.

For the purpose of adjusting the machine for boxes of different lengths, two of the four principal groups of devices, and designated by *a* and *b* in Figs. 3 and 5, are carried by a bed-plate 63, which rests on ways 64 on the machine-frame, and on which it is adjustable by means of a screw 65, operated by a hand-wheel 66, connected to said bed-plate and passing through a stationary nut 67. This bed-plate also carries the bearings for shaft 32, so that all parts on which said devices *a* and *b* depend for operation may be moved together to or from the other devices. After adjustment of the bed-plate the particular bevel-wheel 35 is pushed along shaft 34 and on a key 69 thereon, and put again in contact with the bevel-wheel on shaft 32, in which position it is held by a set-screw. The outer one of the two bottom-nailing devices has naturally to follow this adjustment, for which purpose frame 70, which carries the corresponding group of hammer-ways and hammers, with their slide, is also adjusted on ways 71 by means of a screw 72, stationary nut 73, and hand-wheel 74. The bracket which forms the pivotal support 57 for lever 56, as well as the outer one of cams 58, have of course to follow also this adjustment, the latter being adjusted on key 69, the same as the adjacent bevel-wheel. For adjusting the width of boxes, two of the four devices, and designated by *a* and *c*, have to be adjusted to or from the

other devices, for which purpose they rest on ways 75 and are connected to screws 76, passing through stationary nuts 77 and operated by hand-wheels 78. The only difference in this construction is that the ways on which device *a* is adjusted are located on bed-plate 63, while the ways for the other device are on parts of the main frame. This difference is caused by the necessity of a capacity of adjustment in two directions for device *a*. The corresponding cams 31 on shafts 32 and 33 are, following this adjustment, sliding on keys on these shafts. In this second adjustment for width of boxes, the bottom-nailing devices are not affected and remain stationary, with the exception of the hammer-ways and hammers therein, which are changed to meet the points where the nails are to be driven in. Wall 79 of the receiver which carries the tilting partition 42 is connected to a base 80, resting on ways 81, on which it is adjustable for lower or higher boxes, to or from wall 45, by means of a screw 82 passing through a stationary nut 83 and operated by a hand-wheel 84. This wall 79, unlike wall 45, does not terminate in front of the hammer-ways 49, but continues past them, so as to be enabled to support the frame while the bottom is nailed to it. The width of the face of driver 44 does not need to follow the adjustment of wall 79 in order to fill out the width of receiver 43, because it will always push the frame forward even if not covering the end of it, and being not dependent for guidance on the walls of the receiver, but sliding in ways 85. The stroke of the two drivers does not require any adjustment, the same being so arranged as to bring one end of the shortest frame always to the first set of hammer-ways, the other set of the latter, carried by frame 70, being adjusted to the length of the frame. The upper ends of the sides of chutes 20 are supported by rods 86, on which they are capable of sliding during adjustment, the lower ends moving with standards 23. These upper ends are held in their adjustment by nuts 87. Of the chute feeding the bottoms, only one side requires adjustment, the one which is farther from the starting-point of the drivers.

All the nail-chutes which supply nails to adjustable devices are provided with a pliable section 88, preferably of rubber tubing, the balance being preferably brass tubing, which pliable sections facilitate and follow adjustments.

To avoid confusion in the drawings all the nail-chutes 37 and 52 are partly omitted and partly shown in dotted lines.

Where these machines are built for one certain size of boxes the construction may be greatly simplified, and all the parts described as adjustable may be rigidly secured in fixed positions. While the time which the adjustment from one side to another requires is of no consequence, in view of the fact that these machines are intended for manufacturing boxes in large quantities, and if adjusted once

to a certain size remain in such position probably for a long time, it is nevertheless preferable to limit the range of adjustment to certain sizes in one machine to avoid unnecessary complications, and provide additional machines with another range of adjustment when the variation in sizes is considerable.

The nails for the nail-chutes are thrown upon an inclined shelf 89, having at its upper part a number of troughs 90, from the lower ends of which and in line with their centers and deepest part grooves 91 start downwardly. The width of these grooves is such as to admit the shank of a nail without permitting its head to pass through, which causes all nails coming from trough 90 and caught by grooves 91 in the desired way to be suspended therein in a nearly upright position, their points downward, in which position they slide down on shelf 89. They come to a temporary stop in the upper part of inclined grooves 92 of a cut-off which reciprocates below shelf 89 at right angles to the direction of grooves 91 and at the lower ends of the latter. The angle of these inclined grooves in this cut-off is such that not more than one nail can enter them, the sharp points at 68 passing between this one nail and the next one above as soon as the cut-off starts upon its motion. The straight upper edge of the latter holds all other nails in grooves 91 back, while the one nail caught by each inclined groove proceeds, moving down in grooves 91, in the same ratio as the cut-off continues its motion across. (See Fig. 10.) The lower ends of inclined grooves 92, as well as of grooves 91, are widened, as shown at 93 and 94, the increase being sufficient to permit the head of the nail to pass through, so that when openings 93 and 94 register, at which time the motion of the cut-off stops, the nails lose the support which the narrow grooves 91 thus far furnished and drop through these larger openings into the upper part of the nail-chutes, the entrance to which is facilitated by a funnel-shaped mouth 95. It should be mentioned that these latter are in line with and below openings 93, so that when the nails drop openings 93 94 and mouth 95 are all in line and below one another. For convenience sake, these funnel-shaped mouths are all contained in one rail 96, which receives and holds the upper ends of all the nail-chutes 37 and 52, and also serves as a support for the lower end of inclined shelf 89. Slots 97, in line with and below grooves 91, permit the shanks of the nails to pass into the funnels. After the nails have been released by the cut-off they pass rapidly down through the nail-chutes and enter their respective hammer-ways in front of the hammers therein, where they lie until driven home by the latter. The cut-off returns immediately to its normal position by a motion which may be obtained from any of the moving shafts below in any suitable manner. A specific movement will be described later.

Below troughs 90 and between grooves 91

are slots 98 of considerable width, whereby the solid part of shelf 89 between these slots and to each side of grooves 91 is so diminished as to afford no resting place for nails. This causes all of the latter which have not entered grooves 91 in the proper manner to drop through these slots 98 onto another shelf 99, from which they slide into a tray 100, which prevents their waste and keeps them from dropping all over the machine. This tray is pivotally connected to a slide 101, moving in grooved guides 102 and reciprocated by a crank 103 on shaft 34, to which it is connected by a yoke 104. After the cut-off has done its work this tray commences to rise until it is in line with the highest point of shelf 89 and above the upper end of troughs 90, at which time it is tipped by reason of a lever 105 on it coming in contact with a stop 106. This causes the nails therein to be thrown upon troughs 90, from whence some pass on and are retained by grooves 91, while the balance, not caught, drop back through slots 98 onto shelf 99. Until the return of tray 100 the nails are held back by slide 101, which has moved up with the tray and now lies across shelf 99.

It is my object to have quite a quantity of nails in excess of immediate requirements in motion, so that grooves 91 always receive a sufficient quota out of the whole. To prevent any of the nails from passing down on shelf 89 when tray 100 empties itself, I provide a partition 107 reaching across the lower ends of slots 98, and parts of which I extend down into said slots. This partition holds the nails back and gives them time to drop through slots 98. On the downstroke of slide 101 a pin 108 strikes a rod 109, connected to the partition, which latter is pivotally suspended and causes it to swing away from shelf 89 and out of slots 98 therein. The object of this movement is to release any nails which might have become lodged against this partition and in slots 98. When the slide rises and before the nail-tray tips, this partition assumes its normal position against the shelf, being carried back by a counterweight 110. The reciprocating motion of the nail cut-off is obtained by a lever 111, to which it is connected and which is actuated by a cam 112 on slide 101. The action of lever 111 is counteracted by a spring 113.

I will now proceed and recapitulate the different functions of the machine in their proper order. The four sides of the box are taken from four chutes, all converging toward a common center and their lower ends all at even height, so that the lowest side in each chute is also at even height with the sides supplied by the other chutes. The feed device moves all four sides at once and an even distance, so that all sides stop at the same time and again at even height. The means which guide the sides during this movement are so disposed that the sides occupy the same position to each other which they occupy in the completed box. The feed device having com-

pleted its work—that is, moved the sides within reach of the nailing devices—returns for the next set of sides while the latter devices drive the nails. This first result of the machine is an oblong frame without a bottom and it is discharged from its position by the next set of four sides while they advance to be nailed. The discharged frame falls onto a tilting partition in such a manner as to drop sidewise into a receiver and in front of a driver. This latter advances the box-frame, while a supplementary driver advances a bottom for it taken from a chute across the lower end of which it passes, the two—that is, frame and bottom—advancing together and stopping at the same time, being then in a position which they occupy in the completed box. When they stop they are opposite another set of nailing devices which drive the nails, while the drivers return to be in proper position to advance another bottom and the next frame which is now about ready to drop. This second frame, while advancing to be nailed, pushes the completed box, previously nailed, out. The nail-supplying device above operates in conjunction with this cycle of functions and delivers the necessary set of nails each time.

Having described my invention, I claim as new—

1. In a box-nailing machine, the combination of four standards arranged on a quadrangular plan and at the corners thereof, vertical guides 21 affixed to them, feed-bars guided and vertically reciprocating on them, four inclined chutes, one on each side, their lower ends supported on the standards and terminating at even height in front of guides 21 with sufficient space between to permit the lowermost box-side to leave the chute, yielding supports on the standards on which the four lowermost box-sides rest after having left their respective chutes, nail-chutes terminating below these latter, nail-drivers supported on the standards and reciprocating within the discharge ends of the nail-chutes and continuously rotating power-driven shafts to which the feed-bars and the nail-drivers are permanently connected and whereby they are simultaneously operated and caused to perform automatically their proper functions in their respective order.

2. In a box-nailing machine, the combination of four standards arranged on a quadrangular plan and each provided with vertical guides 21, vertically reciprocating side-feed-bars and nail-drivers or hammers reciprocating in the discharge ends of nail-chutes, side-supplying inclined chutes terminating in front of guides 21 with a space between, to permit the lowermost side to leave its respective chute, pawls on the side-feed-bars so disposed thereon as to enable the latter to act at once on two box-sides near their adjoining ends, a nail-feed to supply the nail-chutes, two parallel shafts 32 and 33 and a shaft 34,

for transferring the motion of one to the other, one of them constituting a driving-shaft, all continuously rotating and having the side-feed bars, nail-drivers and the general nail-feed permanently connected to them, whereby these devices are simultaneously operated and caused to perform automatically their proper functions in their respective order.

3. In a box-nailing machine, having inclined side-supplying chutes, side-feed and side-nailing devices for the purpose of completing a box-frame, the combination of a receiver adapted to contain the box-frame after it is completed, an inclined chute for delivering bottoms to said receiver, nail-chutes terminating within the latter with hammers reciprocating within their discharge ends, a driver reciprocating lengthwise through the receiver for the purpose of advancing the box frame therein with a bottom for it to the proper position opposite the nail-chutes to be nailed and power-driven, continuously rotating shafts to which said driver and nail-hammers are permanently connected and whereby they are simultaneously operated and caused to perform automatically their proper functions in their respective order.

4. In a box-nailing machine, the combination of two parallel shafts 32 and 33 and a shaft 34 for transferring the motion of one to the other, one of them constituting a driving-shaft, side-feed and side-nailing devices permanently connected to the parallel shafts, inclined chutes supplying sides to the side-feed devices, a receiver into which the completed box-frame drops, an inclined chute supplying bottoms to the receiver, bottom-nailing devices permanently connected to shaft 34, a box-frame and bottom-feed permanently connected to one of the parallel shafts, a general nail-feed to supply nails to all the nailing-devices, permanently connected to shaft 34, said shafts 32, 33, and 34 rotating continuously, whereby all devices connected to them are operated simultaneously and caused to perform automatically their proper functions in the respective order.

5. In a box-nailing machine, the combination of four groups of side-feed and nailing devices, each group consisting of a base and standard 23, guides 21, feed-bars 24, and nail-hammers, inclined side-supplying chutes which are supported on said standards, two parallel shafts 32 and 33, each connecting to the side-feed and nailing devices of two of the groups, a shaft 34, connected to shafts 32 and 33 by bevel-gearing to transfer the motion from one shaft to the other, two of the groups with their shaft and its bearings supported on a bed-plate 63, which rests adjustably on ways 64 and whereby said two groups may be adjusted to or from the other two groups opposite them, the bevel-wheel which meshes with the bevel-wheel on the adjustable shaft being also adjustable on its shaft 34, and one of the two groups carried on the

adjustable bed - plate 63, being adjustable on the latter to and from the other groups thereon.

5 6. In a box-nailing machine, the combination of a series of side-feed-devices whereby the four sides of the box are assembled and put in proper position to be nailed and whereby the previously nailed set of sides is discharged, nailing-devices to connect the sides, a tilting
10 partition 42 and a receiver 43 below it so disposed that the former causes the discharged frame to turn and enter the receiver sidewise, nailing-devices disposed in line with this receiver, a reciprocating driver 44, to bring the
15 box - frame opposite these nailing - devices, means to supply a bottom between these latter and the box-frame, means to supply nails to all the nailing devices and mechanism to which all movable devices and parts are op-
20 eratively connected and whereby they are simultaneously operated and caused to perform automatically their functions in their respective order.

25 7. In a box-nailing machine, the combination of a series of side-feed-devices whereby the four sides of the box are assembled and put in proper position to be nailed and whereby the previously nailed set of sides is discharged, nailing-devices to connect the sides, a tilting
30 partition 42 and a receiver 43 below it, so disposed that the former causes the discharged frame to turn and enter the receiver sidewise, a chute 48, supplying bottoms toward this receiver, but separated therefrom by a parti-
35 tion 45 and terminating in front of the latter within sufficient distance to permit the lowest bottom to pass out sidewise, nailing devices disposed in line with the receiver, drivers 44 and 47, reciprocating together at either side
40 of partition 45, the one passing through the receiver, the other across the lower end of

chute 48 and whereby a box-frame and a bottom are simultaneously delivered in front of the nailing-devices, means to supply nails to all of the latter and mechanism to which all
45 movable devices and parts are operatively connected and whereby they are simultaneously operated and caused to perform automatically their functions in their respective order.

50 8. In a box-nailing machine, having side-feed and nailing-devices whereby parts of a box are assembled in their proper positions and nailed together, the combination of nail-chutes, leading to all the nailing-devices, an
55 inclined shelf 89, with grooves 91, of a width to admit the shanks of the nails only, the lower ends of which grooves are sufficiently enlarged at 93 to permit the nail-heads to pass and are so located as to be above and in line with the
60 mouths of the nail-chutes, and a reciprocating cut-off between grooves 91, and the mouths of the nail-chutes, having the inclined grooves 92, enlarged at 94, slots 98 between grooves 91.
65 to permit nails, not received by the latter, to drop through, an inclined shelf 99, a tilting tray 100 below shelf 99 wherein these unused nails collect, a reciprocating slide which carries this tray to the upper edge of shelf 89, to
70 supply the nails thereto and mechanism to which all movable devices and parts are operatively connected and whereby they are simultaneously operated and caused to perform
75 automatically their functions in their respective order.

In testimony whereof I affix my signature in presence of two witnesses.

HERMAN W. BECHT.

Witnesses:

WM. KRAMER,
C. SPENGEL.