No. 610,490. Patented Sept. 6, 1898.

H. L. MANN.

MACHINE FOR MAKING CLOTHES PINS.

(No Model.) (Application filed Mar. 7, 1898.)

8 Sheets—Sheet 1.

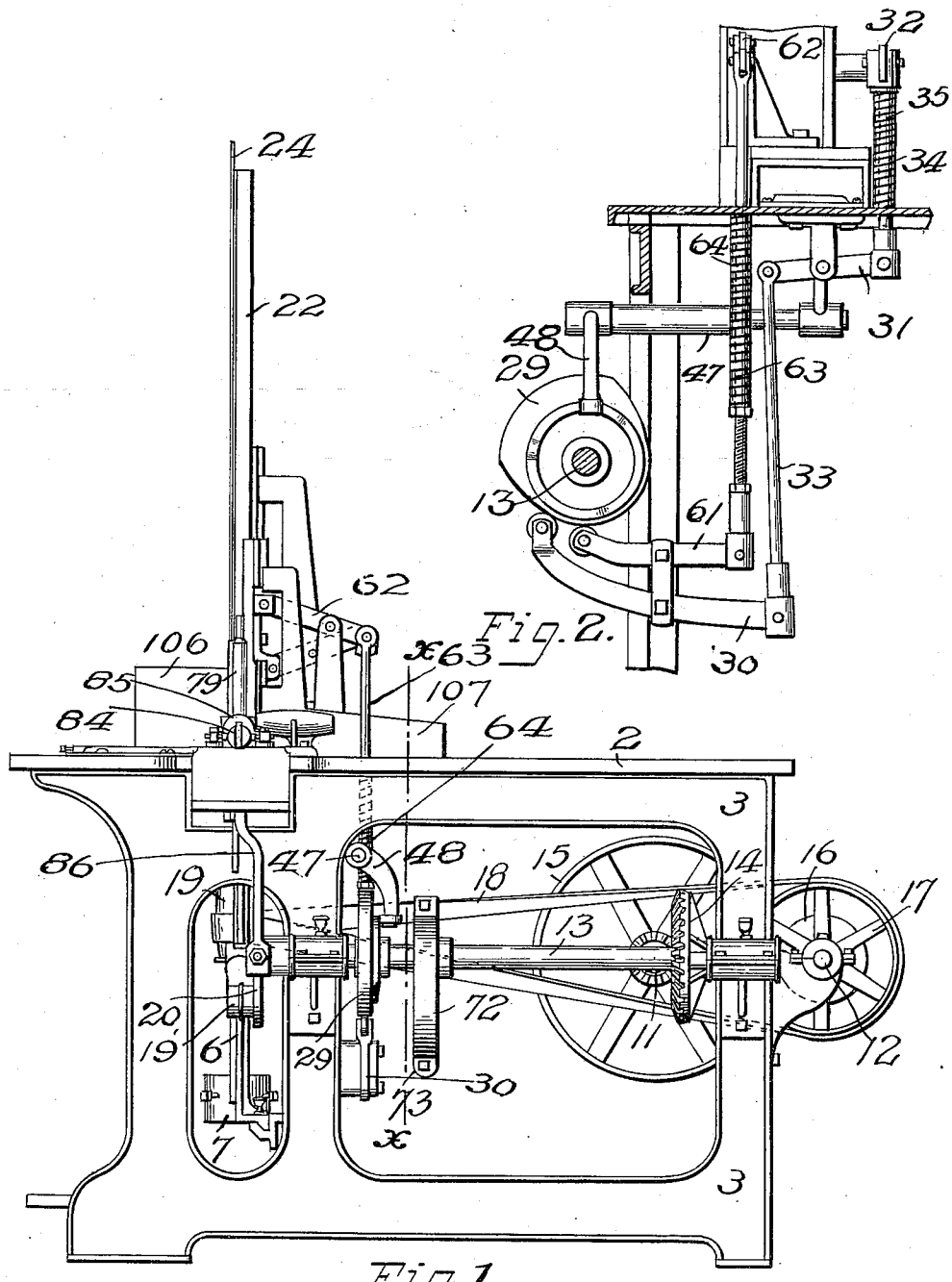


Fig. 2.

Fig. 1.

Witnesses
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M. E. Gooley

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By Paul & Hawley
his attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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(No Model.) 8 Sheets—Sheet 2.

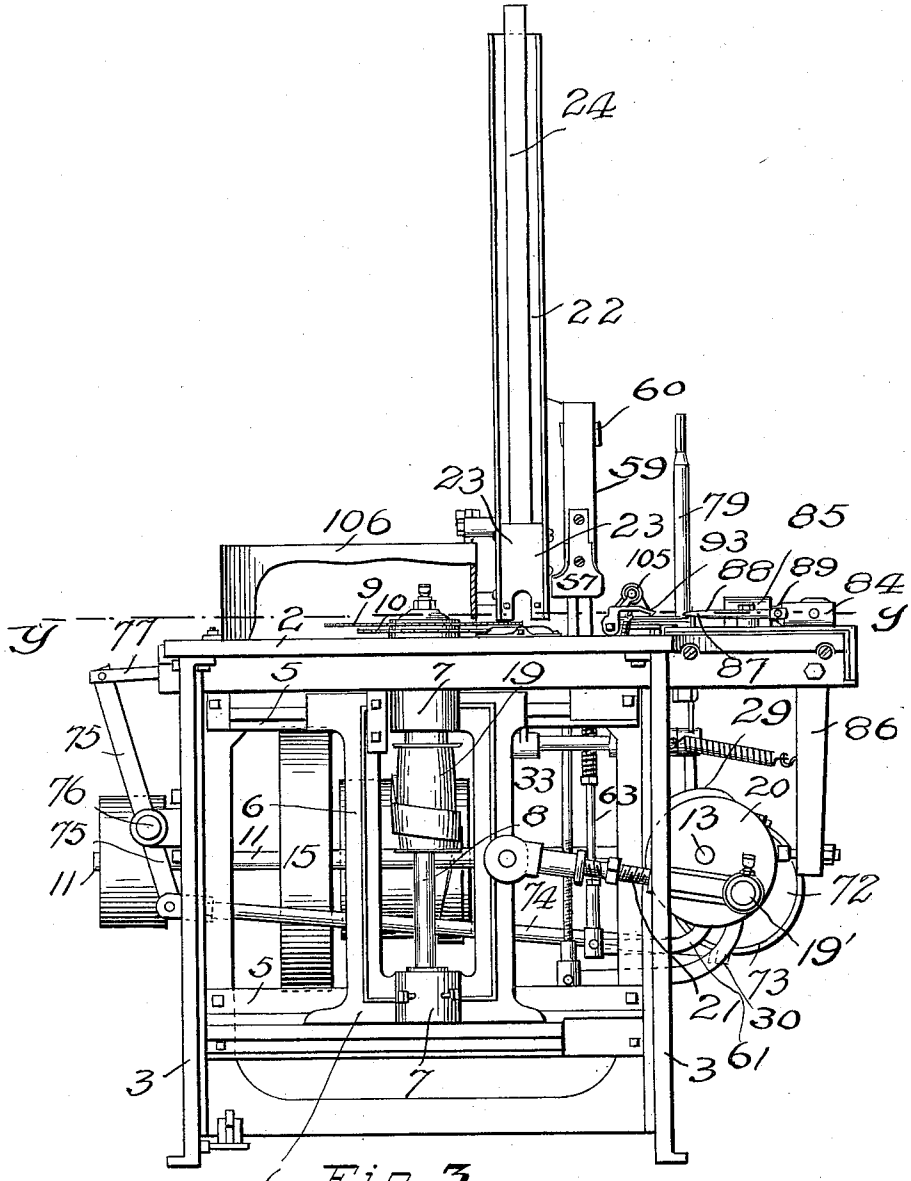


Fig. 3.

Witnesses
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(Application filed Mar. 7, 1898.)

(No Model.) 8 Sheets—Sheet 3.

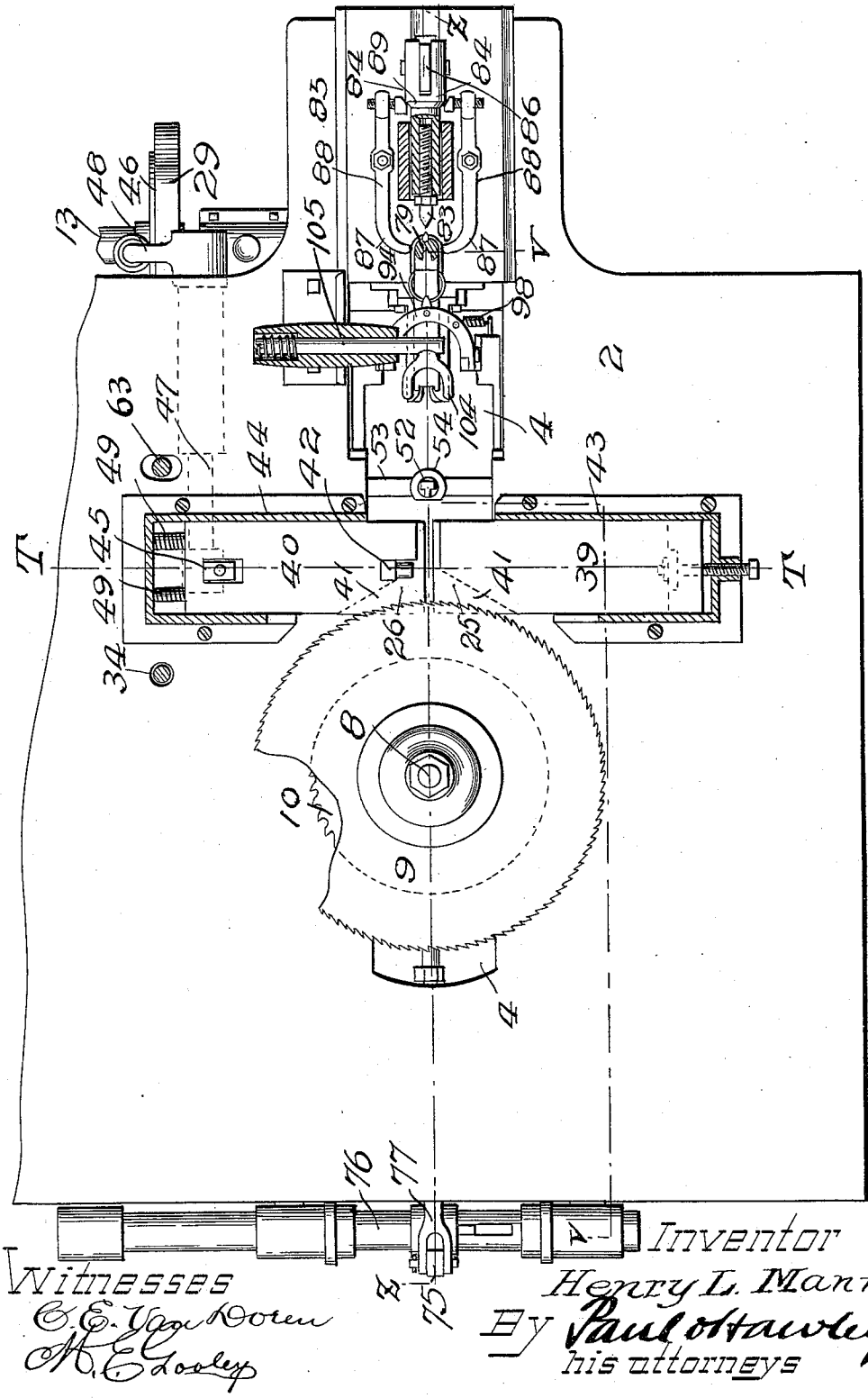


Fig. 4.

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MACHINE FOR MAKING CLOTHES PINS.

(No Model.) (Application filed Mar. 7, 1898.) 8 Sheets—Sheet 4.

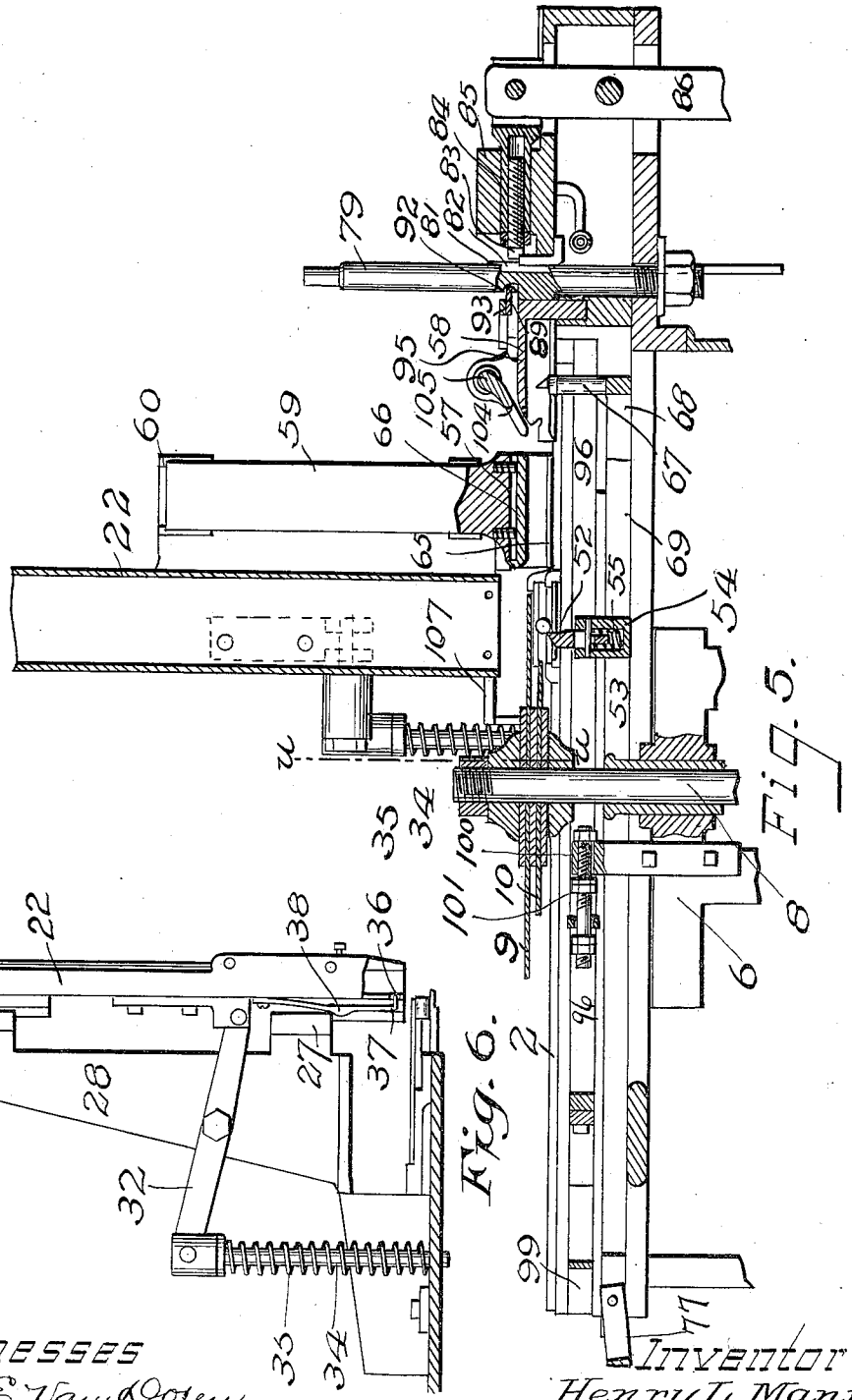


Fig. 5.

Fig. 6.

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(No Model.) (Application filed Mar. 7, 1898.) 8 Sheets—Sheet 5.

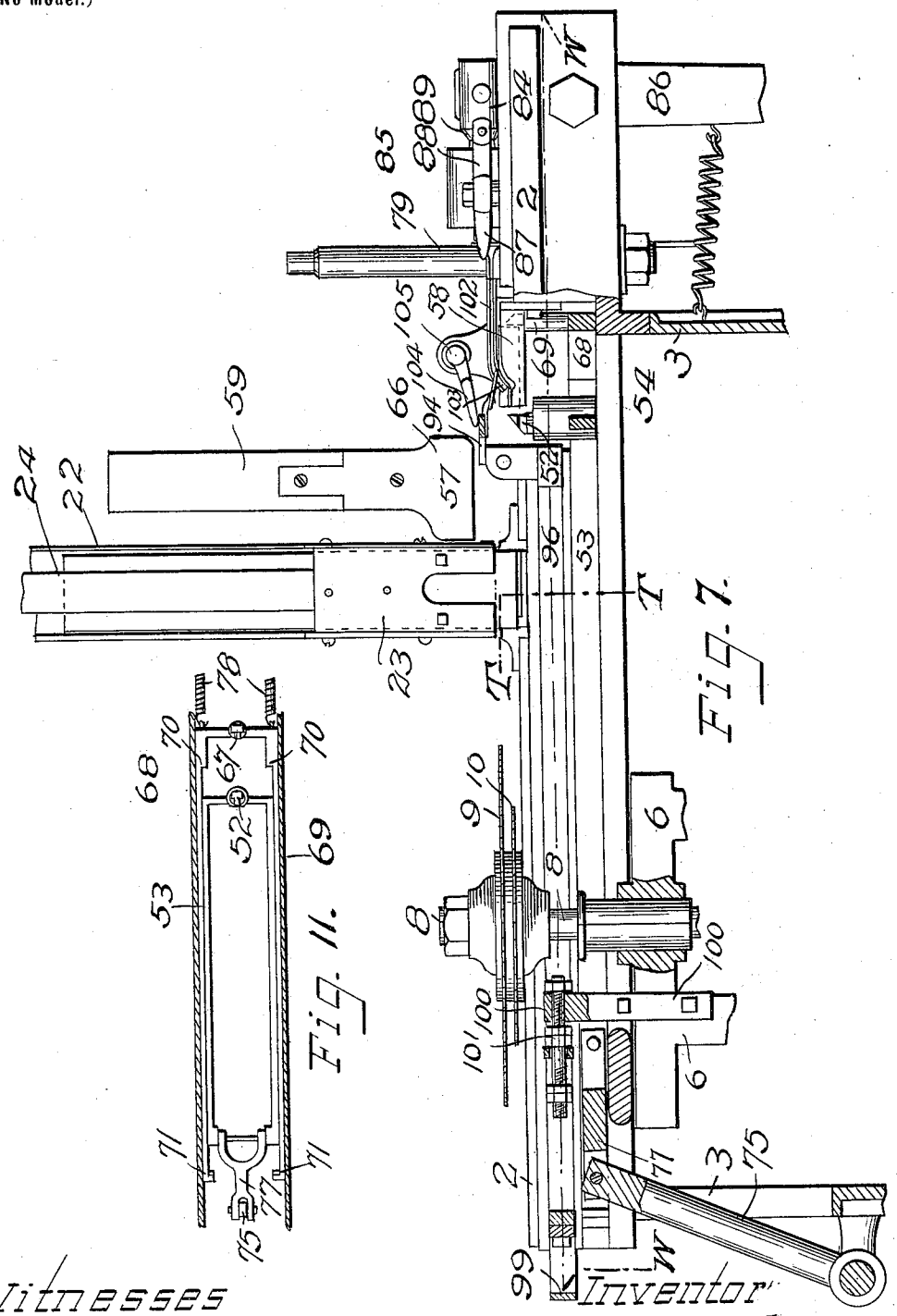


Fig. 7.

Fig. 11.

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(No Model.) (Application filed Mar. 7, 1898.) 8 Sheets—Sheet 6.

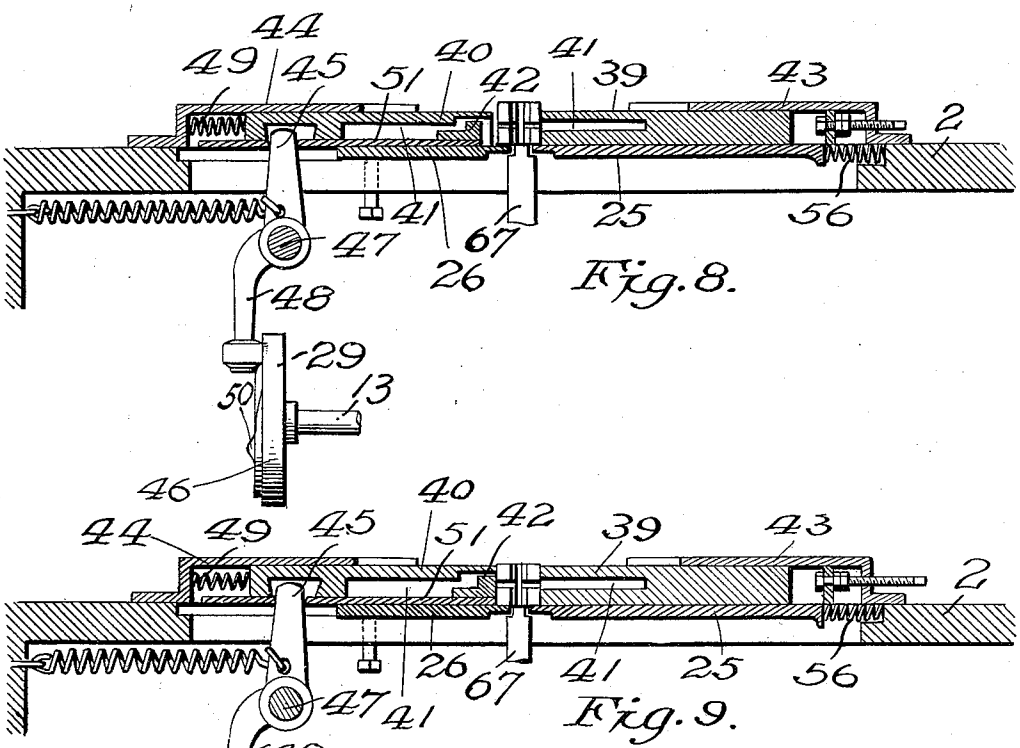


Fig. 8.

Fig. 9.

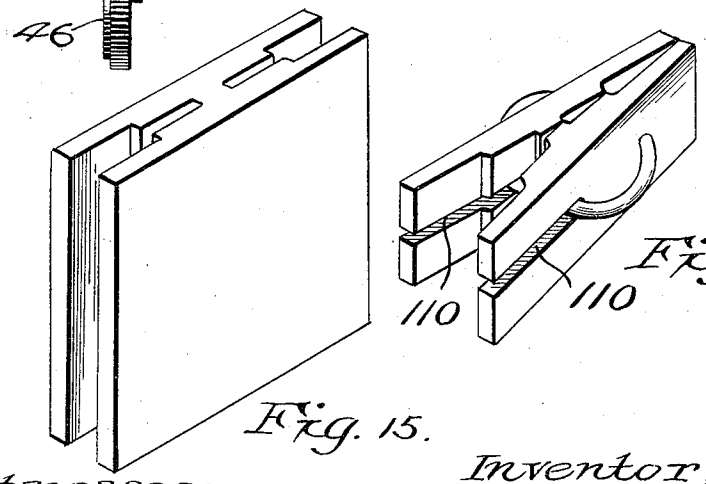


Fig. 15.

Fig. 14.

Witnesses;
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No. 610,490. Patented Sept. 6, 1898.

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MACHINE FOR MAKING CLOTHES PINS.

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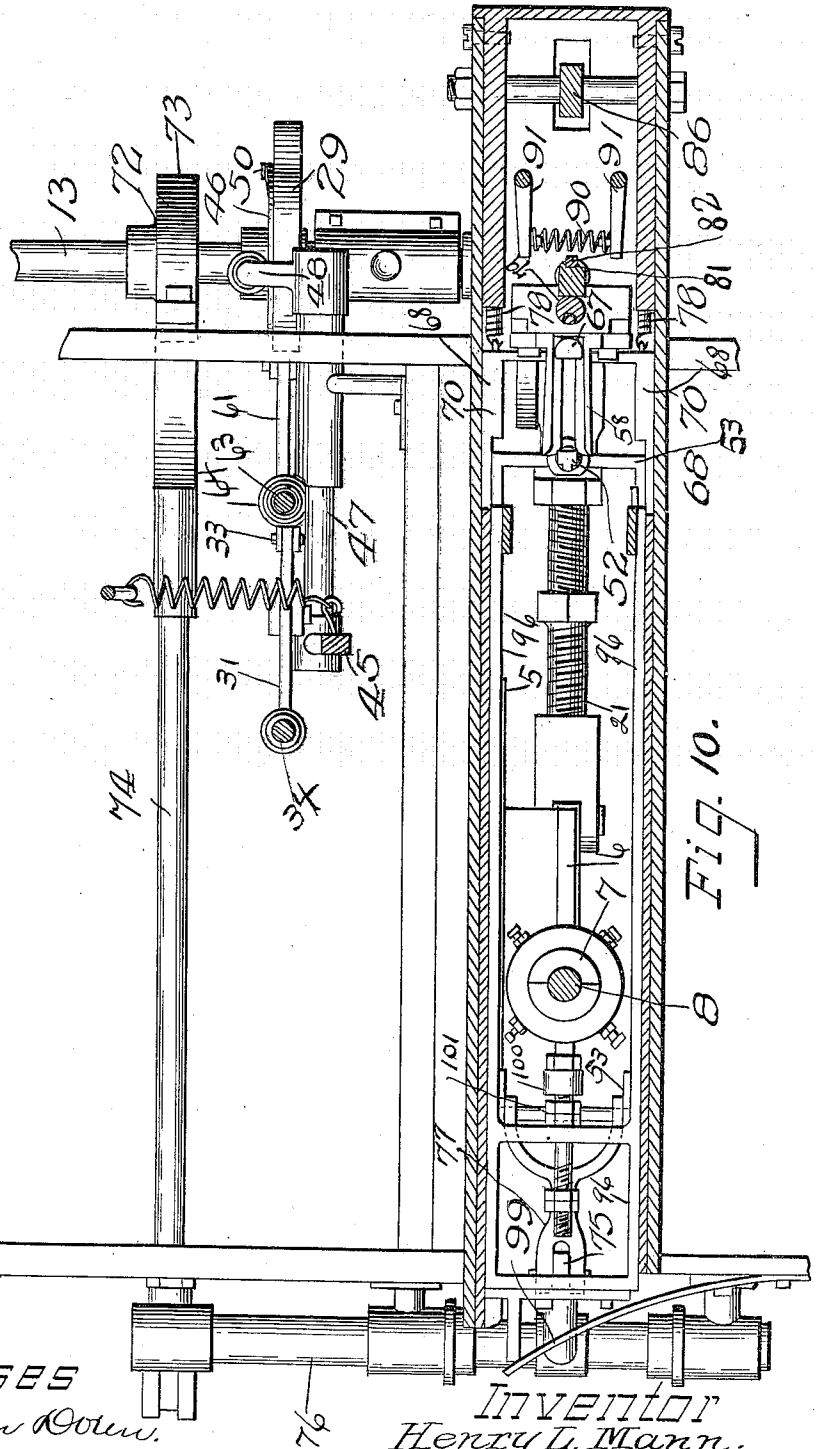


Fig. 10.

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MACHINE FOR MAKING CLOTHES PINS.

(No Model.) (Application filed Mar. 7, 1898.) 8 Sheets—Sheet 8.

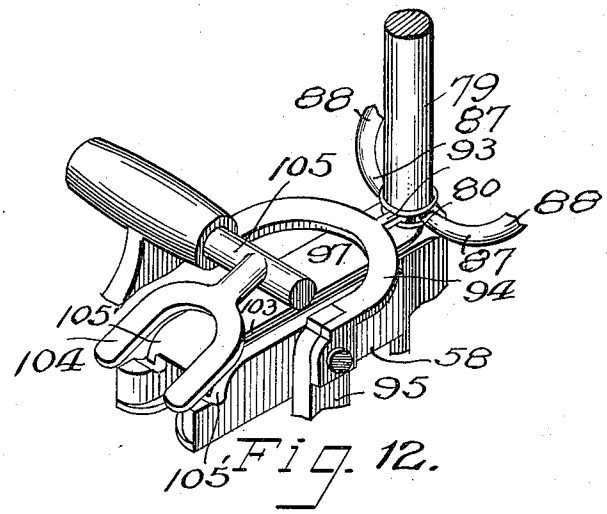


Fig. 12.

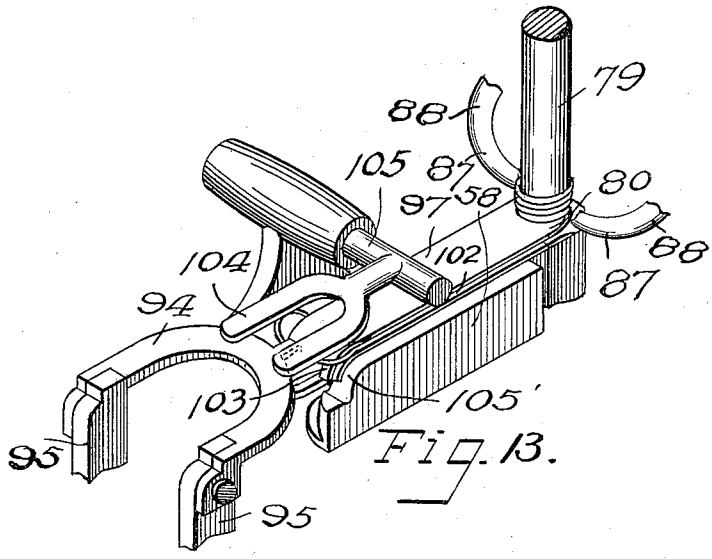


Fig. 13.

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UNITED STATES PATENT OFFICE.

HENRY L. MANN, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE J. R. CLARK COMPANY, OF SAME PLACE.

MACHINE FOR MAKING CLOTHES-PINS.

SPECIFICATION forming part of Letters Patent No. 610,490, dated September 6, 1898.

Application filed March 7, 1898. Serial No. 672,873. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. MANN, of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Machines for Manufacturing Clothes-Pins, of which the following is a specification.

This invention relates to machines for manufacturing clothes-pins, and particularly to a machine adapted for manufacturing the clothes-pin described and claimed in United States Patent No. 356,127, issued January 18, 1887, to Royal E. Hoyt.

The object of the invention is to provide a single machine adapted to cut and shape the pins or blocks and also to place the spring-rings thereon. The clothes-pin described in said patent comprises two short wooden levers having a fulcrum between them, with an open spring-ring held in slots at one end of said levers and bearing or pressing upon the opposite ends of said levers to close the same upon one another. A machine for the manufacture of such pins must include a mechanism for feeding the blocks from which the pins are cut, also means for clamping the blocks, means for sawing or cutting the pin from the block and also cutting the slot therein, means for carrying the block out of the clamp and between suitable ring-guides, means for cutting or forming the ring, means for drawing out and expanding the ring, and means for placing the ring upon the block, and, finally, means for discharging the finished pin all in a few movements and so rapidly that a large number of pins may be turned out per minute.

The particular object of my invention is to provide a comparatively simple pin-making machine that will be capable of operation and that will be durable and easily kept in order.

The invention consists generally in a clothes-pin machine of the construction and combination of parts hereinafter described, and particularly pointed out in the claims.

The invention will be more readily understood by reference to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a detail sectional view on the line *x x* of Fig. 1. Fig. 3 is a front view of the machine. Fig. 4 is an enlarged horizontal section substantially on the line *y y* of Fig. 3. Fig. 5 is a vertical section substantially on the line *z z* of Fig. 4. Fig. 6 is a detail elevation on the line *u u* of Fig. 5. Fig. 7 is a sectional view substantially on the line *v v* of Fig. 4. Fig. 8 is a cross-section on the line T T of Figs. 4 and 7. Fig. 9 is a similar view showing the clamping-plates withheld. Fig. 10 is a horizontal section on the line *w w* of Fig. 7. Fig. 11 is a detail illustrating the two slides which carry the rams or heads. Fig. 12 is a detail perspective view of the pin-guide and the ring-placing mechanism. Fig. 13 is a similar view showing the ring drawn out. Fig. 14 is a perspective view of the clothes-pin made by this machine. Fig. 15 is a perspective view of the blank or block prepared for the machine.

In the drawings, 2 represents the saw-table, having a suitable frame or stand 3. In the table is a transverse slot 4 (see Fig. 4) for the saw-arbor and the various working parts of the machine. On the frame are transverse guides 5 for the movable saw-frame 6, in bearings 7 of which the saw-arbor 8 is arranged. The saw-arbor projects up through the slot or opening 4 in the table and on its upper end bears the two saws 9 and 10. These lie in a horizontal plane, and the upper saw 9 is of greater diameter than the circular saw 10. The frame has bearings for the driving-shaft 11 and the driven shaft 12 and also for the shaft 13, which is arranged on the side of the frame at right angles to the other shafts. The shaft 13 is driven from the shaft 11 by the bevel-gears 14, (see Fig. 1,) and the shaft 12 is driven by means of friction-pulleys 15 and 16 on the shafts 11 and 12. The shaft 12 carries the pulleys 17, and from this a belt 18 extends to a small pulley 19 on the saw-arbor. The pulley 17 is a wide one to permit the whipping of the belt caused by the reciprocation of the frame 6. This reciprocation is accomplished by means of a crank 19′, provided on the side of the cam 20 on the shaft 13 and connected with the frame 6 by a preferably adjustable rod 21.

Centrally above the slot in the table and above the point reached in the forward throw or movement of the saws 9 and 10 is the

blank-feeding device or chute 22, the same being a vertical trough or chute of a size to receive the prepared wooden blanks, one of which is shown in Fig. 15. This chute is movable, but in its lowest position does not reach the plane of the upper saw 9. The lower end of the chute is preferably made up of adjustable plates 23, whereby the same may be made to snugly hold the blank. The upper front side of the chute is preferably closed by a spring 24, which permits access to the opposite ends of the blanks in the chute. The lowest blank in the chute projects from the lower end thereof and rests upon the stop-plates 25 and 26. (See Figs. 4, 8, and 9.) The chute is slidable in guides 27, provided on the standard 28, and it is moved by means of a cam 29, arranged on the shaft 13. (See Figs. 6, 1, and 2.) The connection between the cam and the chute is made by means of the pivoted levers 30, 31, and 32 and the connecting-rods 33 and 34. The weight of the chute is sufficient to hold the lever 30 in contact with the cam 29; but a pressure-spring 35 may be added, if desired.

In the lower part of the rear wall of the chute are holes 36, through which prick-points 37, arranged on the springs 38, are projected when the chute is lifted. These points engage the blank to lift the same away from the part or pin that has been cut therefrom. When the blank drops upon the stop-plates 25 and 26, it is caught between the clamping-plates 39 and 40, over the tops of which the saw 9 moves, while said plates are provided with recesses 41 (see dotted lines, Fig. 4) to permit the entrance of the smaller saw 10. In connection with these plates I prefer to arrange a stamp 42, (see dotted lines, Fig. 4,) the operation of said stamp and the plates being best understood by reference to Figs. 4, 8, and 9. As there shown, the plate 39 is unyieldingly though adjustably held in its guide or box 43, while the plate 40 is adapted to slide in its guide or box 44, being withdrawn by an arm 45, actuated from the side cam 46 on the cam-wheel 29, being operatively connected therewith by the rocking shaft 47 and the arm 48. The plate 40 is pressed forward by light springs 49, but is only allowed forward movement to press upon the block or pin when the arm 48 is upon the raised part of the cam 46. The side cam is provided with a short rise 50, which causes a quick movement of the arm 48 (see Fig. 10) to quickly operate the plate 51, which carries the die 42 and is engaged with the arm 45 to move positively therewith. The die is thus thrust against the block and quickly withdrawn in order to prevent the rubbing of the block upon the die as the block is pushed from between the clamping-plates. The block or pin is thus taken from between the plates by a movable ram or head 52, which is carried by a slide 53 and is movable toward and from the saw-arbor. The ram 52 is normally lifted in the sleeve 54 on the slide by a spring 55, (see Fig. 5,) but the top of the ram is beveled, and when the slide is drawn back the head or ram, which is T-shaped, will be pressed down beneath the plates 25 and 26 and will rise between the same and the saw-arbor. Sufficient space may be left between the plates 25 and 26 (see Fig. 4) to allow the passage of the T-shaped head in its forward stroke; but I prefer to make the plate 26 stationary and arrange the plate 25 and a pressure-spring 56 to yield and thus open the way for the forward movement of the head or ram. The ram in forcing the pin from between the clamping-plates 39 and 40 carries the same into the movable guide or shoe 57, and through the same into the fixed guide or holder 58. The spring-ring is placed upon the pin during the time that it is held in the fixed guide 58, and the pin is discharged from said guide in a finished state. To get the pin out of the guide 58, it is necessary to lift the movable guide or shoe 57 out of the way. Therefore the shoe-bar 59 is arranged to slide in guides 60 and is lifted by means of the cam 29, being operatively connected therewith by the levers 61 and 62 and the adjustable connecting-rod 63, the movement of which is preferably opposed by a spring 64. As indicated in Figs. 5 and 7, the lower part of the shoe is provided with a slot 65 to permit the T-head or ram 52 to pass through the shoe, and the walls of the shoe or guide are made by adjustable plates 66, which may be moved to take up wear. The pin which is carried into the fixed guide 58 by the ram 52 is discharged therefrom by another ram 67, which works through a slot in the bottom of the guide or holder 58 and is carried on a slide 68. The slide 68 and the slide 53 of the ram 52 preferably occupy the same horizontal guides 69 provided therefor beneath the saw-table and parallel with the movement of the saw-arbor carriage or frame 6. The slide 53 (see Figs. 7 and 11) operates between shoulders or lugs 70 71 of the slide 68 and is positively propelled by the cam 72, (see Figs. 1 and 3,) said cam being connected with the slide 53 by the cam-strap 73, the connecting-rod 74, the arms 75 of the rocking shaft 76, and the link 77. The slide 68 is drawn forward by a spring or springs 78, (see Figs. 10 and 11,) and said slide 68 is operated by the slide 53 as the same engages the lug 71 to draw the slide 68 back. Hence the pin will not be struck by the ram 67 until the ram 52 has been drawn back out of the way.

At the end of the fixed guide 58 is the wire-coil spindle 79. The wire for the rings is made into a coil or spiral and is placed upon the spindle 79, having its lower end resting upon the shoulder 80 at the foot thereof. The spindle is suitably secured in the bed or table, and in the side thereof is a groove 81 to receive the spline or key 82, suitably secured and having its edge sharpened to form a knife whereon the lower coils of the spiral rest to be severed by the cutter 83, adjustably ar-

ranged in the reciprocating plunger 84, that is held in the guide or sleeve 85 on the table. This plunger is operated by means of the lever 86, the lower end of which engages the edge of the cam 20. 87 87 represent dividing-fingers which are the ends of pivoted levers 88, that are operated by engagement with the beveled shoulder 89 on the plunger 84. While the plunger is drawn back the fingers 87 stand away from the spindle 79, being so held by the spring 90, arranged between arms 91, attached to the levers 88. (See Figs. 4 and 10.) When the plunger is forced in, the fingers enter between the lowest coil and the next coil of wire on the spindle, separating the same and forcing the lower coil down upon the shoulder or plate 80 at the foot of the spindle. The spindle is provided in its lower part with a recess 92 to receive the drawing-out hook 93, adapted to snap in over the lower coil at the moment the lower coil is severed from the others by the cutter 83. This hook 93 operates over the plate or top of the fixed guide 58, being carried by the yoke 94, that is preferably pivoted upon the short standards 95, that project upward from the slide 96, which is preferably arranged in guides above the slides 53 and 68. The yoke 94 is held down so as to press the hook upon the top or plate portion 97 of the fixed guide 58, a short spring 98 being employed between the yoke and the slide 96. The downward movement of the yoke is limited, however, so that the hook never falls below the lowest level of the plate 97. The yoke-carrying slide 96 is pressed forward by a suitable spring 99 (see Figs. 5 and 10) and is thereby held in engagement with the arm or lug 100, which projects upward from the saw-frame 6. The travel of the saw-arbor and its slide or saw-frame 6 is greater than that of the slide 96, and hence after the hook of the yoke has entered the recess at the lower end of the spindle the slide 96 will stop and the saw will continue its forward movement, and, further, the saw will move back from beneath the chute before the ring-hook will start—that is, before the lug 100 strikes the slide 96. I prefer to use an adjustable lock-nut or screw 101 between the lug 100 and the slide 96 in order that the drawing-out movement of the hook may be accurately fixed.

On the sides of or above the part 58 are the guides 102, having the downwardly-turned ends 103. These guides extend from the knife on the rear side of the spindle 79, and when the hook engages the ring or coil at the foot of the spindle 79 the ends of the ring will draw into the guides 102 and the ring will be drawn out to the position shown in Fig. 7.

104 is a striker arranged on the spring-shaft 105 and raised by the yoke 94. This striker when the yoke returns over the guide 58 drops down, as shown in Fig. 12, and knocks the ring down against the lugs or shoulders 105′ on the end of the part 58, in which position the ring will be taken into the block or pin as it is forced out of the guide 58 by the ram 97. The saws are preferably covered by a guard 106, and back of the chute 22 there is a box or duct 107, to which the suction-pipe is connected to carry away the sawdust and the small pieces of wood and prevent the clogging of the machine.

The operation of my machine is as follows: The machine is driven by a belt running over a pulley on the shaft 12 and the saws are rotated at a high speed. To operate the other portions of the mechanism, the friction-pulley 15 is moved into engagement with the friction-pulley on the shaft 12, thereby setting the former and the shaft 11 into rotation to rotate the cam-shaft 13. The blanks are first cut or formed with the deep grooves or saw-cuts in their edges, as shown in Fig. 15. Blanks like the one shown are placed in the chute 22 with their grooves extending vertically therein and the grain of the wood extending transversely of the chute to be longitudinal of the pin that is afterward sawed from the blank. The lower block in the chute projects therefrom and rests upon the plates 25 and 26 and between the ends of the opposite clamping-plates 39 and 40. The stamp or die 42 is then quickly thrust forward and drawn back by the quick rise on the side cam 46, and the arm 45 is held forward by the high part of said cam 46 to allow the clamping-plate 40 to be pressed forward by its spring 49. The lower end of the block is thus firmly clamped and held preparatory to the operation of the saw. At this moment the saw is moved forward by the operation of the crank on the shaft 13, and a pin or block is cut from the lower end of the blank by the upper and larger saw. Meantime the smaller saw enters the end of the pin or block and cuts the slots 110 therein, as shown in Fig. 14, the same being to receive and hold the solid or middle portion of the spring-ring that is immediately afterward placed upon the pin. As the saw retires the ram 52 is drawn back beneath the plates 25 and 26 and takes the position behind the same. It then moves forward with its T-head above the plates 25 and 26 and pushes the pin out and between the two clamping-plates 39 and 40. At this time the chute 22 is raised by the operation of the cam 29 and the blanks are caught in the chute and raised in the chute by the drag-points 37, which are projected into the lower end of the chute by the raising thereof. (See Fig. 6.) The pins do not engage the blank until enough thereof has been exposed for the next pin, and if there is not enough wood left from a blank the points will not catch it, and the result will be that the small waste piece will drop down or will be drawn back through the suction spout or box 107. A moment later the movable chute or guide 57 is dropped by the action of the same cam 29 and receives the pin as it is thrust from between the plates 39 and 40 by the ram 52. The ram moves through the chute 57 and carries the block into the guide 58. The mov-

able chute is then raised, and the chute 22 is dropped to place the next pin in position for the saws. Meantime the yoke, with the hook 93, has been moved forward to take a ring from the spindle and is drawn back by the action of the saw-slide having the lug 100. This ring will be in the position shown in Fig. 7, with its ends in the guides 102. As the saw travels forward to cut the next pin the yoke 94 and its hook will be moved forward by the spring 99, as permitted by the saw-slide, and the knocker 104 will drop upon the ring and throw the same down over the end of the pin within the guide 52 and opposite the slots 110 in the ends thereof. As the yoke 94 and the saw move forward the ram 52 and thereby the ram 69 on the guide having the lugs 71 are drawn back, and the ram 69 ejects or forces the pin out of the fixed guide 58, catching the solid or middle portion of the ring in the slots 110 and finally drawing the ring out of the guides 102, the curved ends 103 of which carry the ends of the ring to points opposite the middle of the sides of the pin, so that as the pin is discharged the ends of the ring will drop upon said sides to bear thereon, as shown in Fig. 14. The complete pin thus made is carried from the machine by a suitable spout or hopper. The cutter 83 preferably operates at the moment after the fingers 87 have been forced against the sides of the spindle to separate the coils thereon and at the moment that the hook 93 on the yoke 94 snaps in between the separated coils and engages the lower coils. The fingers are not withdrawn until the ring is started out by the return movement of the hook 93.

It is obvious that various modifications of my invention will be readily suggested to those skilled in the art by the foregoing, and I therefore do not confine my invention to the specific construction herein shown and described.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a clothes-pin machine, the combination, with suitable saws or cutters, of a suitable feed mechanism and a clamping device, means for removing the pin from the clamping device, and a spring-ring-placing mechanism, substantially as described.

2. The combination, with the saw or cutter mechanism, of a clamp or holding mechanism, a ring-spindle, a ring-guide, and a drawing-out mechanism for placing the ring upon the pin, substantially as described.

3. The combination, with the saws or cutters, of the block holding or clamping device, means for carrying the block or pin out of said clamping device, a holder, guides thereon, a ring-feed device, a ring-drawing-out device, and means for discharging the pin from the said holder and thereby finally withdrawing and placing the ring, substantially as described.

4. The combination, with the saws or cutters, of the clamping device, the pin-holder whereto the pin is carried after it is sawed, the ring-drawing mechanism, the ring-striker, and means for expelling the pin from said holder and dropping the ends of said ring upon the sides of the pin as the same is expelled from said holder, substantially as described.

5. The combination, with means for preparing the pins, of the guide 58 to receive a pin, the spindle 79, the cutter, the guides for the ends of the ring, said guides terminating near the end of said holder or guide 58, the drawing-out hook, the yoke, the striker or knocker lifted by said yoke in its drawing-out movement, and adapted to strike down the ring upon the forward movement of said yoke, and the ram operating within said guide 58 to eject the pin and thereby place the ring thereon, substantially as described.

6. The combination, of the spindle 79 provided with the recess or opening in its lower part, with the guide or holder 58 having side guides for the ends of the ring that is taken from said spindle, and the drawing-out hook operated above said guide 58 and adapted to enter said recess to engage the lowest ring upon said spindle, substantially as described.

7. The combination, with the guide 58 and the means for placing the pin thereon, of the ring-spindle 79, the cutter, the dividing-fingers, means for operating said cutter and said fingers, the said guides for the end of the ring extending from said spindle to or near the end of said guide 58, means for drawing out and throwing down a ring, and means for ejecting a pin from said guide 58 to withdraw and place the spring-ring, substantially as described.

8. The combination, with the guide 58, of the ring-feed device provided at one end thereof, the shoulders or stops 105 provided at the opposite end thereof, the guides at the sides of said part 58, the drawing-out hook, the striker, and the means for expelling a pin from said part 58, substantially as described.

9. The combination, with the spindle 79, of the guide 58, with the ring-guides at the sides thereof, the dividing-fingers, the cutter, said fingers being operated by the movement of said cutter, and the drawing-out device for taking the rings from said spindle, substantially as described.

10. The combination with the movable saw-arbor and the clamp device, of the ring-placing mechanism, the slides 53 and 68, the dogs or rams provided upon said slides, and adapted to remove the pin from said clamp and from said ring-placing mechanism, respectively, means for positively operating one of said slides and for operating the other therefrom, substantially as described.

11. The combination, with the saws, of the plates 25 and 26, the blank-chute, the clamping-plates 39 and 40, means for operating at least one thereof, and the slide provided with the yielding ram adapted to drop beneath said

plates 25 and 26 and to move forward above and between the same, substantially as described.

12. The combination, with the saw-arbor and its movable frame, of the blank feed or chute, the clamp, the fixed guide, the wire feeding and cutting mechanism, the drawing-out hook and the slide whereon the same is carried, said slide being operated in one direction with said arbor, substantially as described.

13. The combination, with the saw-arbor and the saws movable above the same, of the movable blank-chute, the plates whereon the lowest blank rests, the movable guide, means for successively raising said chute and said guide, means engaging the blank in said chute, the ring-placing mechanism, and the alternately-operating rams, as and for the purpose specified.

14. The combination, with the saw-table and the saws, of the blank-chute 22, the prick-points provided in the lower part thereof, means whereby said points are projected into the chute when the chute is raised, and means for moving the chute, as and for the purpose specified.

15. The combination, with the saw-table and the horizontally-arranged saws, of the plates 25 and 26, one yieldingly arranged, the clamping-plates 39 and 40, one being stationary and the other yieldingly arranged, the stamp-plate, and the automatically-operating arm working said stamp-plate and permitting the forward movement of the yieldingly-arranged clamping-plate, and means for removing a pin from between said clamping-plate, as and for the purpose specified.

16. The combination, with the movable saws, of the chute, means for raising the chute during the backward movement of said saws, and means engaging blanks in said chute to lift the same and permit the removal of under-sized pieces, substantially as described.

17. The combination, with the saw-table and the reciprocating saw-arbor frame, of the driving-shaft wherefrom the arbor in said frame is driven, the shaft 13 at right angles to the driving-shaft, means for driving said shaft 13, the blank-feed mechanism, and the ring-placing mechanism, and means whereby the same are operated from said shaft 13, substantially as described.

In testimony whereof I have hereunto set my hand this 12th day of January, A. D. 1898.

HENRY L. MANN.

In presence of—
RICHARD PAUL,
A. C. PAUL.