May 5, 1931. H. A. BERTRAM 1,803,587

HEEL SHAPING MACHINE

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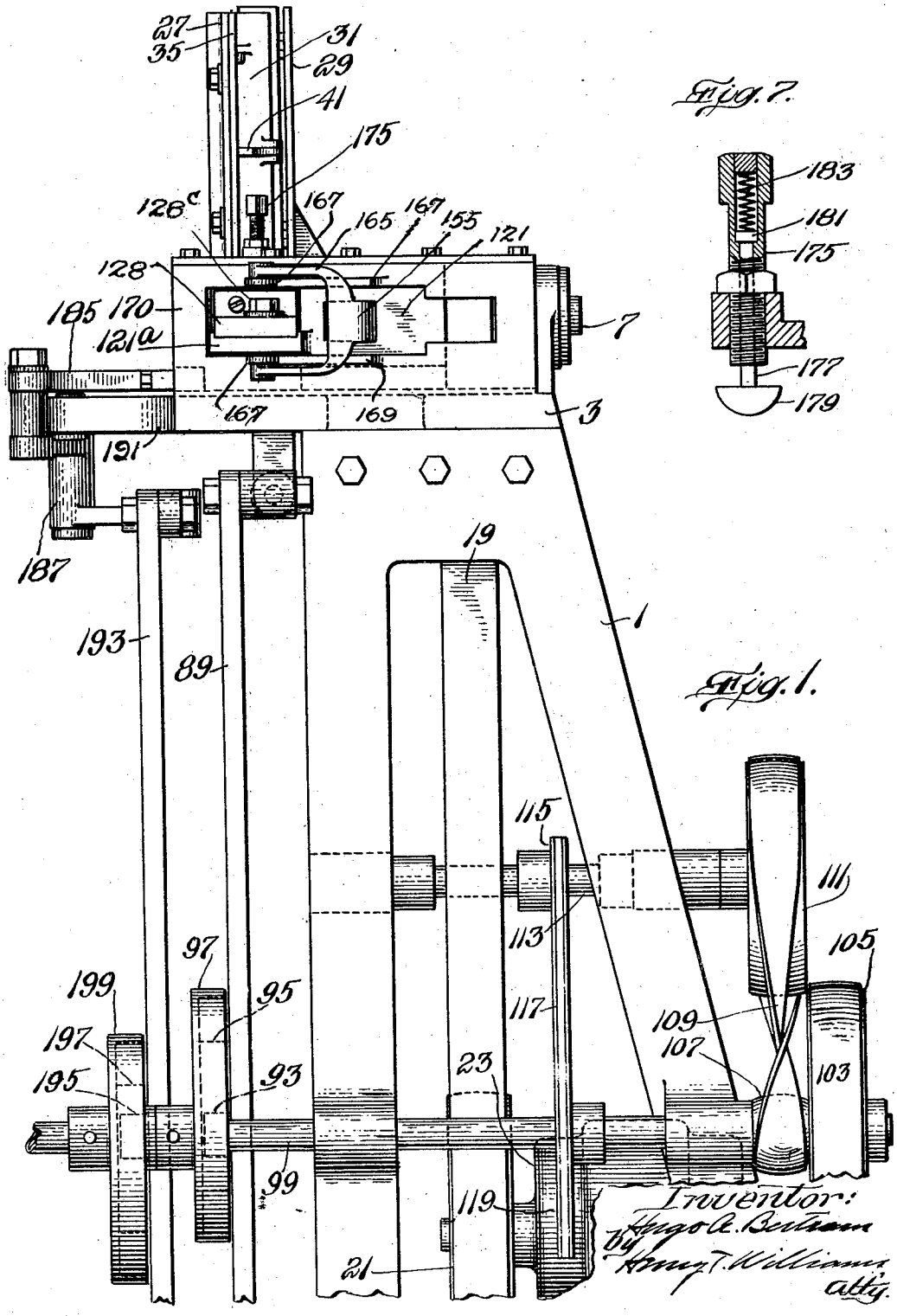


Fig. 1.

Fig. 7.

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Fig. 2.

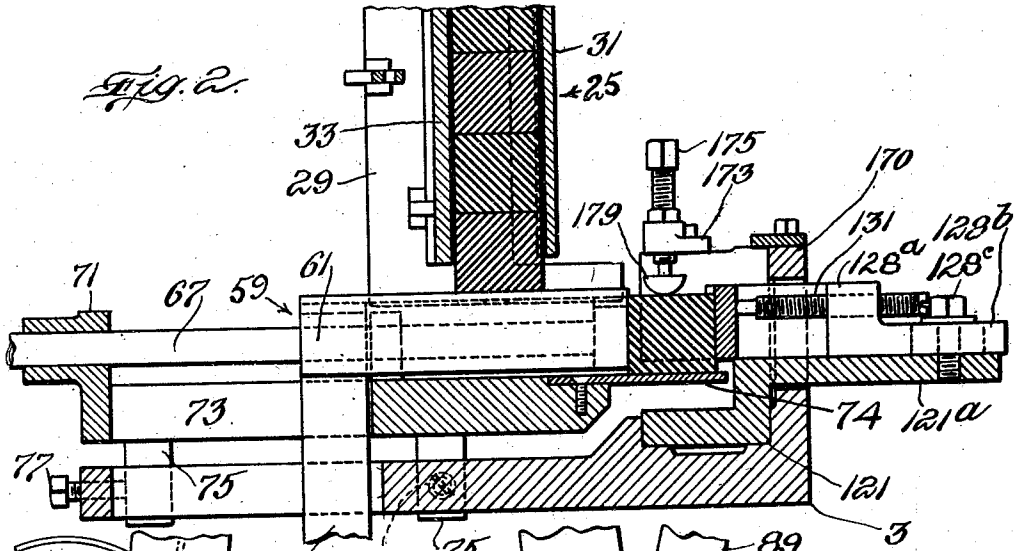
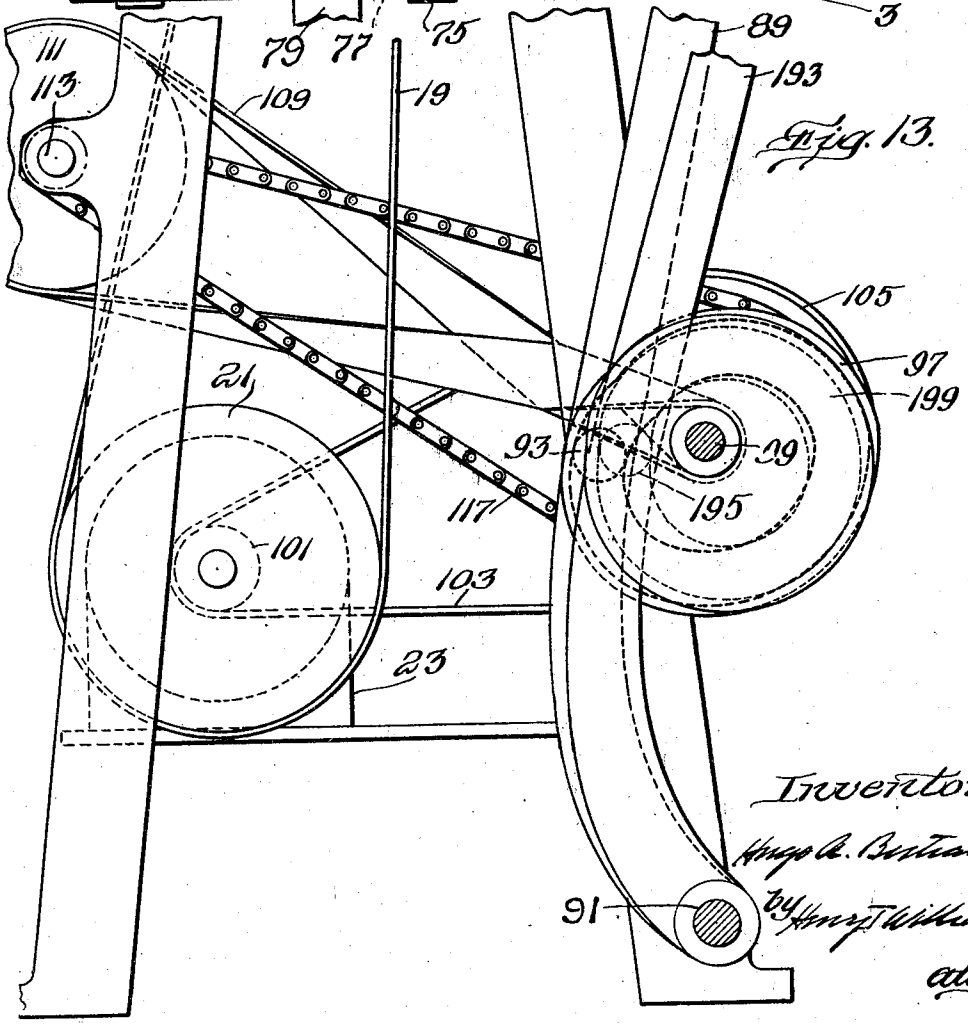


Fig. 13.



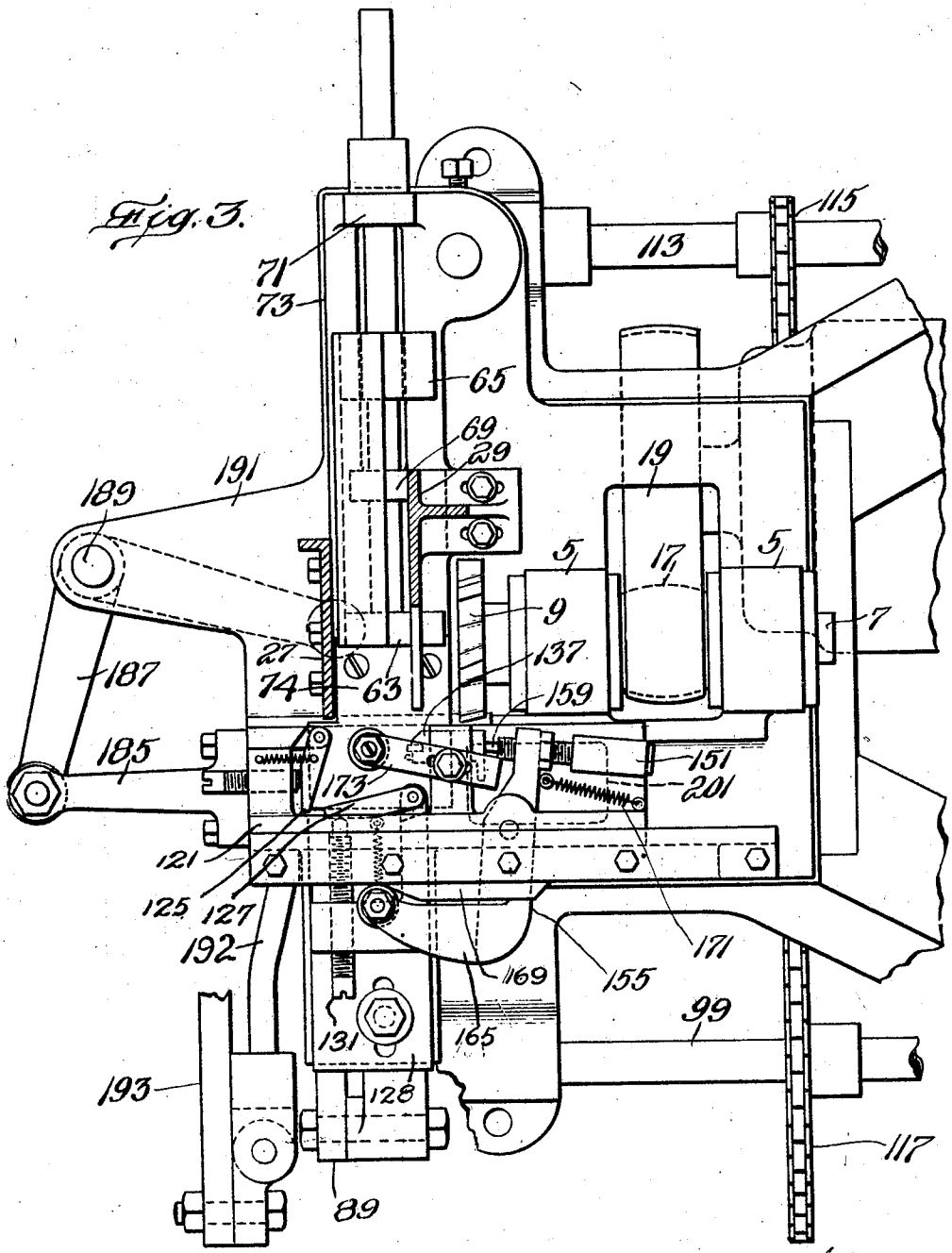
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Fig. 3.

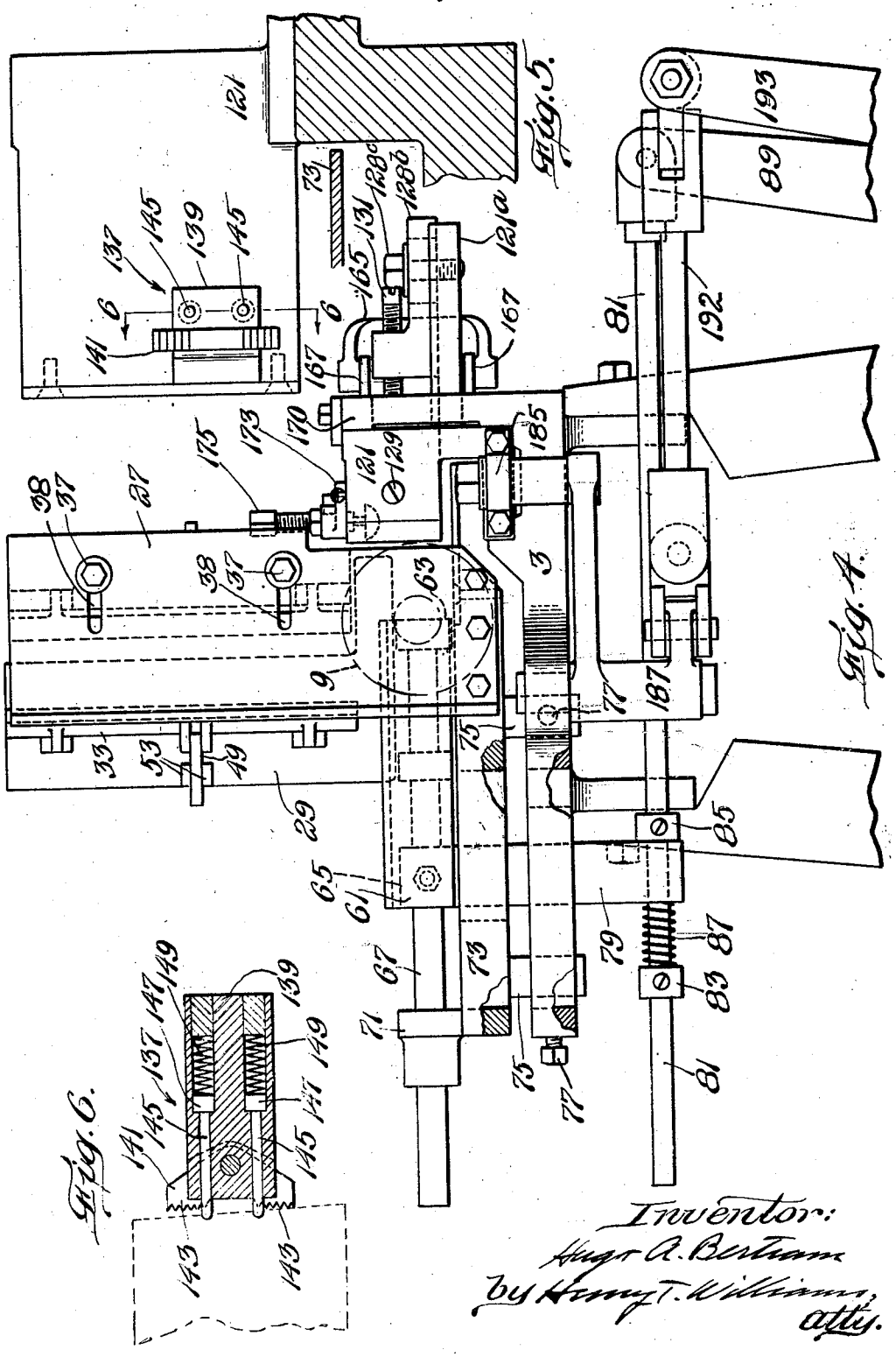


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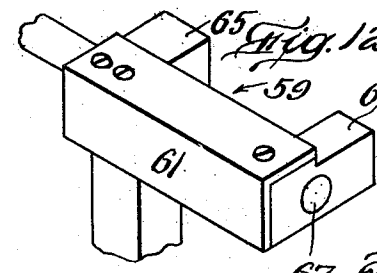


Fig. 12.

Fig. 8.

Fig. 11.

Fig. 9.

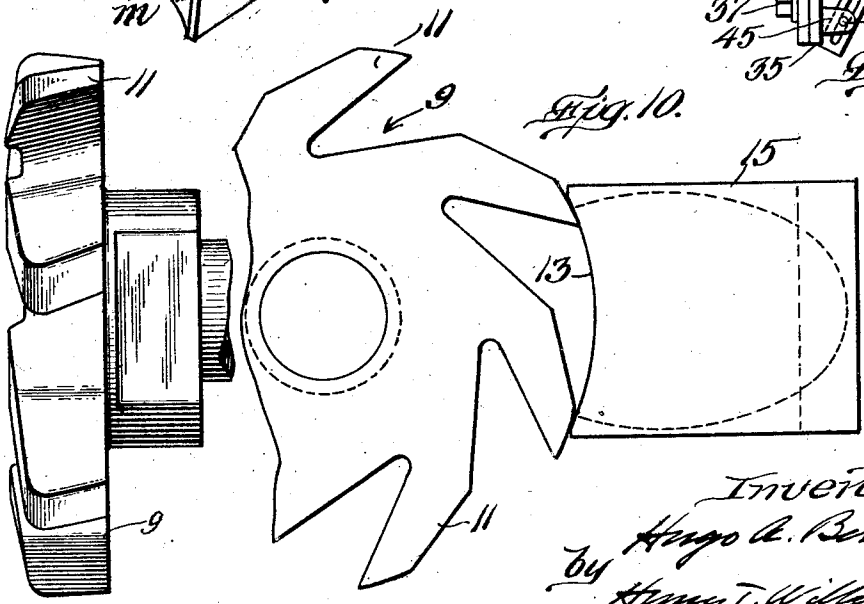


Fig. 10.

Fig. 10.a

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UNITED STATES PATENT OFFICE

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HEEL-SHAPING MACHINE

Application filed May 31, 1929. Serial No. 367,341.

The invention to be hereinafter described relates to machines for shaping the breasts of heels.

A number of types of wood heels including the Cuban type of heel have their breasts concaved transversely. Heretofore difficulty has been experienced in shaping the breast accurately so that it has the proper relation to the other faces of the heel, due partly to the fact that considerable variation occurs in the blocks or blanks which are used in making the heel. In producing these blocks, planks are sawed longitudinally thereof to form strips, and these strips are cut transversely and obliquely at intervals into blocks. The transverse cuts are made rapidly and variation in the dimensions of the blocks is liable to occur, sometimes as much as two or three sixteenths of an inch. Also the sides of the blank which are to become the sides of the finished heel are not always perpendicular to the faces of the blank which are to become the top and bottom of the heel.

Heretofore the block has been so held with relation to the cutter for shaping the breast, that frequently the concaved breast was not properly alined relatively to the top of the heel, and as a consequence a substantial percentage of defective heels resulted.

One of the purposes of the present invention, therefore, is to provide a heel shaping machine which will so hold the heel that the cutter will shape the concaved breast of the heel with proper relation to the top of the heel, and thereby greatly reduce the number of waste heels.

The character of the invention may be best understood by reference to the following description of one good form thereof shown in the accompanying drawings, wherein:

Fig. 1 is a front elevation of the machine;

Fig. 2 is a vertical section through the heel block hopper, table, carriage, heel block holder, and slide supporting plate;

Fig. 3 on an enlarged scale is a plan of the machine, the hopper being shown in transverse section;

Fig. 4 is a side elevation of the upper portion of the machine;

Fig. 5 is a view looking toward the front end of the heel block presser and an elevation of the portion of the carriage on which the presser is mounted;

Fig. 6 is a longitudinal section taken on line 6—6 of Fig. 5, a portion of a heel block being shown in broken lines;

Fig. 7 is a vertical section through the spring-pressed member for engagement with the top of the block;

Fig. 8 is a horizontal section through the holder and hopper showing a block in the holder and a block to follow the one in the holder;

Fig. 9 is a plan of the hopper;

Fig. 10 on an enlarged scale is a side view of the cutter and a block;

Fig. 10*a* is a view of the cutter looking toward the right of Fig. 10;

Fig. 11 is a perspective view, full lines showing the block after having its breast shaped by the cutter, and dot-and-dash lines showing the final shape of the Cuban heel;

Fig. 12 is a perspective view of the slide for delivering the blocks from the hopper to the holder; and

Fig. 13 is an elevation showing the cams and the driving means for the cutter and cams.

Referring to the drawings, the machine shown therein as one good embodiment of the invention, may have any suitable support, in the present instance in the form of a stand 1 (Fig. 1) having four legs supporting a table 3. Mounted on the table in bearings 5 is a shaft 7 having a cutter 9 (Fig. 10 and 10*a*) fast on one end thereof with teeth 11 suitably formed to shape the concaved breast 13 of the heel blank 15. The shaft 7 has a pulley 17 thereon connected by a belt 19 with a pulley 21 on the armature shaft of an electric motor 23.

Mounted on the table is a hopper 25 (Fig. 9) having a fixed wall 27 and an adjustable wall 29. Between these walls are sides 31 and 33. The side 31 is pivotally connected to a plate 35 adjustably mounted on the wall 27 by bolts 37 (Fig. 4) projecting through

holes in the plate 35 and elongated slots 38 in the wall 27. The plate 31 has ears 39 (Fig. 9) pivotally connected to ends of links 41, the opposite ends of which have elongated slots connected by bolts 43 with ears 45 on the plate 35. The plate 33 is pivotally connected to the wall 29, and has ears 47 pivotally connected to ends of links 49, the opposite ends of which have elongated slots therein connected by bolts 51 with ears 53 on the wall 29. The wall 29 has a foot 55 having elongated slots receiving bolts 57 secured to the table. The construction is such that the walls 27 and 29 and plates 31 and 33 may be adjusted to accommodate blocks of various sizes and having front and back faces at various angles with respect to the tops of the blocks.

Beneath the hopper is a slide 59 (Figs. 2, 4 and 12) comprising an angle-shaped member 61 having its top flange secured to a pair of rectangular blocks 63 and 65 secured to a slide rod 67 movable longitudinally through holes in brackets 69 and 71 over a plate 73 having a shelf 74 (Fig. 2) extending beneath the holder. Projecting down from the plate 73 through slots in the table are legs 75 adjustably secured to the table by set screws 77. The construction is such that the plate 73 may be supported at different elevations to accommodate blocks of different thicknesses.

The slide is reciprocated in order to deliver blocks successively from the hopper to a holder to be described. To accomplish this, an arm 79 is secured to the slide, depends therefrom beneath the table, and has an opening through which a rod 81 extends. This rod is provided with a pair of spaced collars 83 and 85 fast thereon, and a coil spring 87 encircles the rod and is confined between the collar 83 and the arm 79, said spring being adapted to be somewhat compressed when the block is pushed into the holder. The rod 81 extends toward the front of the machine, and is pivotally connected to the upper end of a lever 89, the lower end of which is pivotally mounted on a shaft 91 (Fig. 13) at the lower end of the stand. A follower 93 on the lever occupies a groove 95 in a cam 97 (Figs. 1 and 13) suitably formed to impart to the slide its required motion.

The cam 97 is fast on a shaft 99 journalled in bearings on the stand. This shaft should be rotated at a speed much slower than that of the cutter. To accomplish this, the armature shaft of the motor has a pulley 101 (Fig. 13) fast thereon connected by a belt 103 with a pulley 105 on a sleeve shaft 106 (Fig. 1) loose on the cam shaft 99. Secured to the sleeve shaft is a small pulley 107 connected by a belt 109 with a pulley 111 on a countershaft 113 journalled in bearings on the stand. Fast on the countershaft is a small sprocket wheel 115 connected by a sprocket chain 117 with a larger sprocket wheel 119 fast on the cam shaft 99.

Next will be described the holder for receiving the blocks from the slide and for feeding them past the cutter to shape the concaved breasts of the blocks. This holder is on a carriage 121 (Figs. 2, 3 and 4) mounted to reciprocate on the table 3 transversely to the path of the slide and parallel to the axis of the cutter. The holder has a recess 123 for receiving the block, and pivotally mounted in this recess is a stop or abutment 125 to be engaged by the top of the block, and a stop or abutment 127 to be engaged by the back of the block. The stop 127 is pivotally mounted on an arm 128 projecting laterally from a flange 128*a* on a plate 128*b* slidable in a groove in a lateral extension 121*a* of the carriage, said plate being held in different positions of adjustment by a bolt 128*c* entered through a hole in the extension and an elongated slot in the plate. A screw 129 on the holder is engaged by the stop 125, and a screw 131 on the plate flange 128*a* is engaged by the stop 127. The stop 127 is held against the screw 131 by a coil spring 133 having one end secured to the stop, and the other end secured to said flange. The screws 129 and 131 may be adjusted to vary the angles of the stops 125 and 127 and the plate 128*b* may be adjusted, to accommodate blocks of various shapes and sizes.

An important feature of the invention is the construction whereby the block is so held in the holder that when the block is fed past the cutter, a concaved breast will be formed which has its medial line *m*—*m* (Fig. 11) perpendicular to a line *t*—*t* in the plane of the top of the block which is a tangent to the arc 135 at the intersection of the arc and the medial line *m*—*m*. In other words, the concaved breast of the blank should be on an arc whose axis is coincident with the axis of the cutter, and perpendicular to said tangent.

To properly hold the blank in the holder, a presser 137 (Figs. 5, 6 and 8) is provided having a body 139 slidably mounted on the carriage and having a thin rocker jaw 141 pivotally connected to the front end of the presser with toothed portions 143 adapted to engage and bite into the bottom of the block. The presser has a pair of pins 145 in bores in the presser with heads 147 engaged by coil springs 149, said pins being for a purpose to be described. Projecting laterally from the rear end of the presser is a lug 151 (Fig. 8) opposite a recess in the carriage containing a coil spring 153 which tends to retreat the presser from the block.

A bell-crank 155 is pivotally mounted on the carriage, and one arm thereof carries a

tube 157 having a reduced portion threaded to said arm and held in different positions of adjustment by a nut 158. A pin 159 projects through the tube and engages the rear end of the presser. A coil spring 161 is confined between a head on the pin and a plug 163 threaded into an end of the tube. The other arm of the bell-crank 155 is in the form of a yoke 165 (Figs. 1 and 4) carrying a pair of rollers 167 which are adapted to ride along fixed cam ridges 169 on a wall 170 rising from the table 3. The bell-crank is rocked to hold the rollers against the cams by a coil spring 171 having one end connected to the bell-crank, and the other end connected to the carriage.

To further contribute to proper positioning of the block in the holder, an arm 173 (Figs. 2 and 3) is mounted on the carriage and carries a tube 175 (Fig. 7) in which is a pin 177 having a rounded head 179 at one end thereof, and flat head 181 at the opposite end thereof in a counterbore in the tube. A coil spring 183 urges the head 179 downward until limited by engagement of the head 181 with an end of the counterbore containing the spring 183.

To reciprocate the carriage on the table, an arm 185 (Figs. 1 and 3) is connected to one end of the carriage. A bell-crank 187 is pivotally mounted on a stud 189 carried on a bracket 191 projecting laterally from the table. One arm of this bell-crank is pivotally connected to the arm 185, and the other arm of the bell-crank is connected by a link 192 to the upper end of the lever 193 (Figs. 1 and 13) having its lower end pivotally mounted on the shaft 91 referred to, at the base of the stand. This lever carries a follower 195 in a groove 197 in a cam 199 mounted on the cam shaft 99 referred to. The cam groove 197 is suitably formed properly to reciprocate the carriage and to cause the same to dwell while receiving blocks from the slide.

In operation, the hopper is filled with blocks as shown in Fig. 2, the lowest one of which drops down onto the top of the slide 59, and when the latter retreats will drop down in front of the slide block 63 onto the plate 73. Then when the slide advances the block will be pushed onto the shelf 74 and into the holder; the top of the block will be brought into engagement with the stop 125, the back of the block will be brought into engagement with the stop 127, and the upper side of the block will be engaged by the head 179 of the spring-pressed pin 177. When the holder carriage starts to move to the right (Fig. 8), the yoke carried rollers 167 will ride upon the cams 169, and the bell-crank 155 will thrust the presser 137 toward the block and cause the teeth of the rocker jaw 141 to bite into the bottom of the block, and the latter will be securely gripped between the presser and the stop 125. The presser will cause the top of the block to seat fully and squarely against the stop 125 regardless of whether the lower side of the block engages the shelf at the bottom of the recess 123 or not. The narrow rocker jaw permits the block to adjust itself thereon with such slight rocking movement vertically or horizontally as may be necessary for the block top to rest flat against the stop.

The movement of the bell-crank is yieldingly imparted to the presser through the pin 159 and the spring 161, but since the latter is strong, the top of the block will be firmly held against the stop 125. The carriage is now fed further to the right (Fig. 8), and in so doing the front face of the block is fed past the cutter, which shapes the concaved breast of the heel. As the carriage continues to the right, the rollers 167 will ride off from the cams 169, thereby allowing the spring 171 to rock the bell-crank and move the pin 159 to the right (Fig. 8). The spring 153 now becomes effective to retreat the presser from the block as assisted by the spring-pressed pins 145 which disengage the teeth 143 from the block, and the latter now is free to drop from the holder through the discharge opening 201 in the table. Next the carriage is moved to the left (Fig. 8), and the cycle of operations described is repeated for the next block.

Heretofore, the construction of machines for shaping the breast of the block has been such that lines, ridges or marks occur on the surface of the breast, making it necessary in a subsequent operation to sandpaper the surface in order to give it the required smoothness. The construction of the present machine is such that the breast is given a smooth, polished surface eliminating the necessity of the sandpapering operation. The blades of the cutter have edges oblique to the axis of the cutter. The block is fed in a direction parallel to the axis of the cutter and in the general direction of the edges of the blades. The advance ends of the blade edges remove the stock, and as the block continues past the cutter, the cutting edges of the blades continue to act on the surface of the breast with a shearing action. It will also be noted that peripheral polishing surfaces are provided on the cutter adjoining the rearwardly extending portions of the cutting edges and extending peripherally therefrom in a direction backwardly of such edges. These peripheral cutting edges and polishing surfaces remove any lines, ridges or marks left in the initial cutting operation and serve to leave the concaved breast 13 in a smooth and polished condition.

After the concave front face or breast of the block has been shaped, the block is placed in the turning machine for shaping

the sides and back of the block, and clamped in a position determined by the top of the block. Since the concave face produced by the present machine has the proper relation to the top of the block, and the position of the block in the turning machine is determined by the top of the block, the proper relations of the sides and the back of the heel with respect to the top and breast are assured.

By this invention an efficient heel breasting machine is provided which will automatically feed the heel blocks successively to the holder and relatively to the cutter, and discharge the blocks from the machine without further attention on the part of the operator than to supply the blocks to the hopper.

It will be understood that the invention is not limited to the specific embodiment shown, and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

What is claimed is:

1. A machine for shaping breasts of heels comprising, in combination, a rotary cutter, a hopper for receiving a supply of heel blocks, a holder, a slide for delivering blocks successively from the hopper to the holder, and means for moving the holder and the block therein past the cutter to shape the breast of the heel.

2. A machine for shaping breasts of heels comprising, in combination, a rotary cutter, a hopper for receiving a supply of heel blocks, a holder cooperating with the cutter, and means for pushing a block delivered by the hopper into the holder, said holder being reciprocable in a path parallel to the axis of the cutter.

3. A machine for shaping breasts of heels comprising, in combination, a rotary cutter, a hopper for receiving a supply of heel blocks, a holder, and means for pushing a block delivered by the hopper into the holder, said holder having means for automatically gripping the block therein.

4. A machine for shaping breasts of heels comprising, in combination, a rotary cutter, a hopper for receiving a supply of heel blocks, a support, a carriage on the support having a heel block holder, a slide for delivering blocks successively from the hopper to the holder, means on the holder for automatically gripping a block fed thereto, and means for feeding the carriage along the support to carry the block past the cutter to form the concave breast of the heel, said block gripping means having provision automatically to release the block after it has passed the cutter.

5. A machine for shaping breasts of heels comprising, in combination, a rotary cutter, a heel block holder, means for feeding blocks successively to the holder, means for feeding the holder and block relatively to the cutter to shape the breast of the heel, said holder having means for automatically gripping each block delivered thereto and for automatically releasing the block after it has passed the cutter.

6. A machine for shaping breasts of heels comprising, in combination, a rotary cutter, a heel block holder, means for feeding blocks successively to the holder, means for automatically gripping the block delivered to the holder, and means for moving the holder relatively to the cutter to shape the concave breast of the heel, said gripping means having provision for discharging the block from the holder after it has passed the cutter.

7. A machine for shaping breasts of heels comprising, in combination, a rotary cutter, a heel block holder, means to introduce heel blocks successively into the holder, means to move the holder to carry the block past the cutter to form the concave breast of the heel block, and means on the holder for automatically gripping the block therein so that the cutter will form a concave breast on the block having its medial line perpendicular to a tangent to the arc of the concave breast and in the plane of the block top at the intersection of the medial line and tangent.

8. A machine for shaping breasts of heels comprising in combination, a rotary cutter, a heel block holder having abutments for engagement with the top and back of the heel block, means for automatically seating the top of the block squarely against one of the abutments, and means for moving the holder and the block therein in a straight path past the cutter and parallel to the axis of the cutter to shape the breast of the heel.

9. A machine for shaping breasts of heels comprising, in combination, a rotary cutter, a hopper for receiving a supply of heal blocks, a heel block holder, a slide for transferring blocks successively from the hopper to the holder, means for automatically reciprocating the slide, and means for automatically reciprocating the holder to move the holder to block receiving position, and to move the holder past the cutter to shape the concave breast of the heel.

10. A machine for shaping breasts of heels comprising in combination, a rotary cutter, a hopper for receiving a supply of heel blocks, a heel block holder, a slide for transferring blocks successively from the hopper to the holder, means for automatically reciprocating the slide, and means including a cam for automatically reciprocating the holder to move the holder to block receiving position, and to move the holder past the cutter to shape the concave breast of the heel.

11. A machine for shaping breasts of

heels comprising, in combination, a rotary cutter, a hopper for receiving heel blocks, a holder for receiving a heel block, a slide beneath the hopper for supporting the blocks in the hopper and for delivering blocks successively therefrom to the holder, and means for moving the holder past the cutter to shape the concave breast of the heel.

12. A machine for shaping breasts of heels comprising, in combination, a rotary cutter, a hopper for receiving heel blocks having adjustable walls to accommodate heels of different sizes, a heel block holder, means for delivering blocks successively from the hopper to the holder, and means for feeding the holder past the cutter to shape the concave face of the heel.

13. A machine for shaping breasts of heels comprising, in combination, a rotary cutter, a carriage, a heel block holder thereon having an abutment for engagement with the top of the block, a presser for engagement with the bottom of the block, and means for operating the presser including a bell-crank pivotally mounted on the carriage, a member on one arm of the bell-crank for engagement with the presser, a follower on the other arm of the bell-crank, and a cam cooperating with the follower to rock the bell-crank and cause its member to move the presser toward and against the bottom of the block.

14. A machine for shaping breasts of heels comprising, in combination, a rotary cutter, a support, a carriage movable on the support, a heel block holder on the carriage, an abutment on the holder for engagement with the top of the block, a presser on the holder for engagement with the bottom of the block, a fixed cam on the support, and means on the carriage actuated by said cam for causing the presser to engage the bottom of the block and press the top of the block against the abutment on movement of the carriage relatively to the cutter.

15. A machine for shaping breasts of heels comprising, in combination, a rotary cutter, a heel block holder having an abutment for engagement with the top of the block, and a presser provided with a rocker opposed to said abutment and having a thin edge for engagement with the bottom of the block and adapted to permit the block to seat squarely against the abutment.

16. A machine for shaping the breasts of heels comprising, in combination, a disk-like rotary cutter having cutting blades on and adjacent to the periphery thereof, said blades having cutting edges extending inwardly of the cutter at its forward face and extending continuously from their outer ends rearwardly at the periphery of the cutter at a cutting height which remains substantially constant, and the cutter having polishing surfaces at the periphery thereof adjoining the said rearwardly extending cutting edges and extending peripherally thereof in a direction backwardly of such edges, and means for feeding a heel block toward and past the cutter in a direction parallel to its rotary axis whereby the block will be cut or grooved out by the inwardly extending portions of the cutting edges and the cut-out surface of the heel thereafter finished by the backwardly extending portions of the cutting edges and polished by the said polishing surfaces.

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