

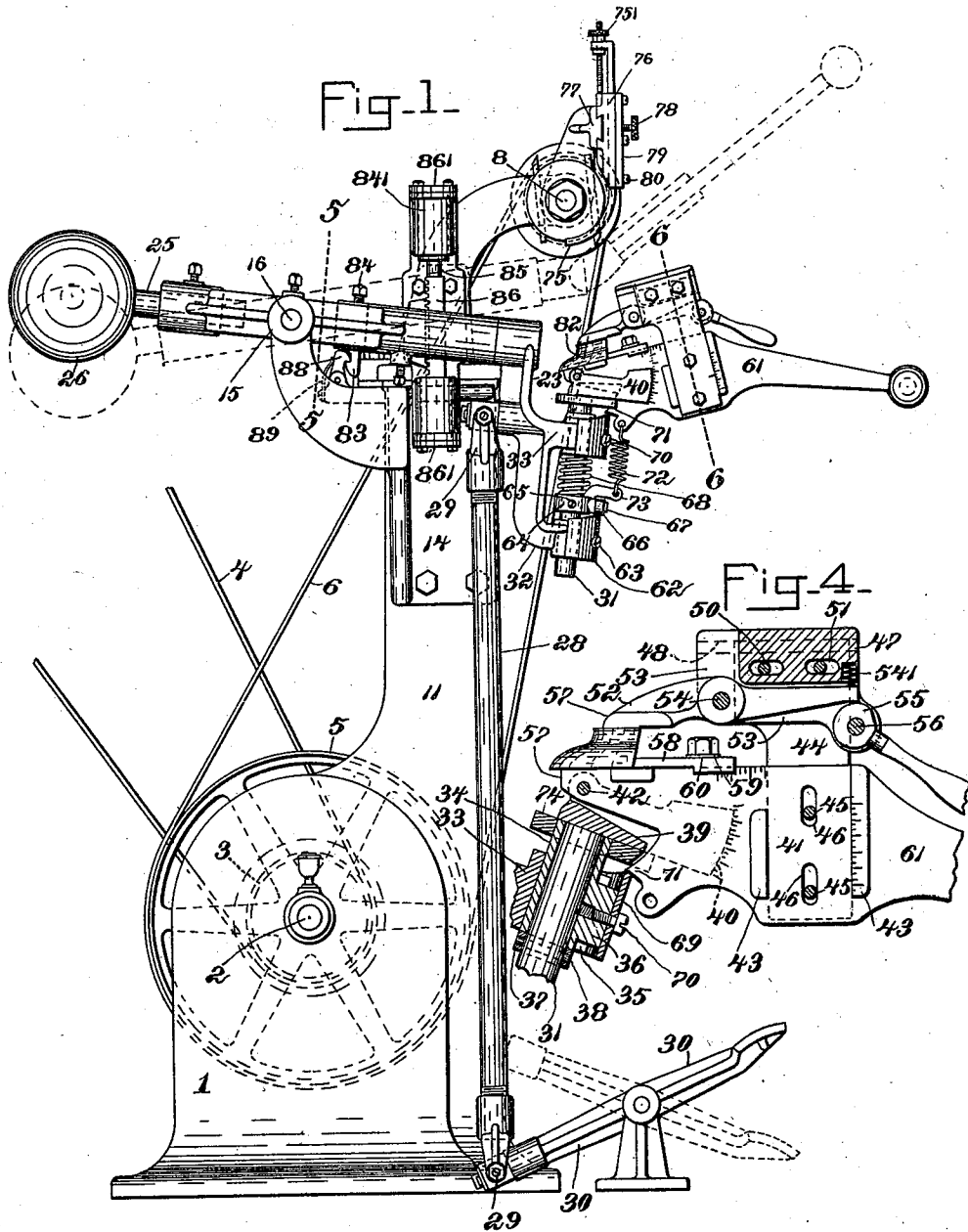
(No Model.)

3 Sheets—Sheet 1.

E. H. TAYLOR.
MACHINE FOR TRIMMING HEELS.

No. 560,378.

Patented May 19, 1896.



WITNESSES:

Robert Wallace.
Arthur Raudall.

INVENTOR:

Eugene H. Taylor
by Macleod Calver & Raudall
his Attorneys.

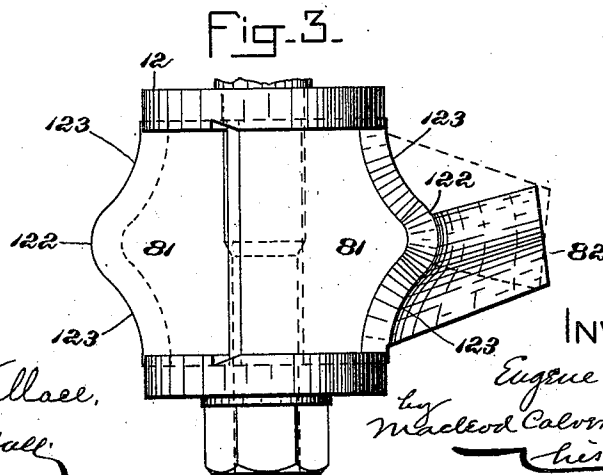
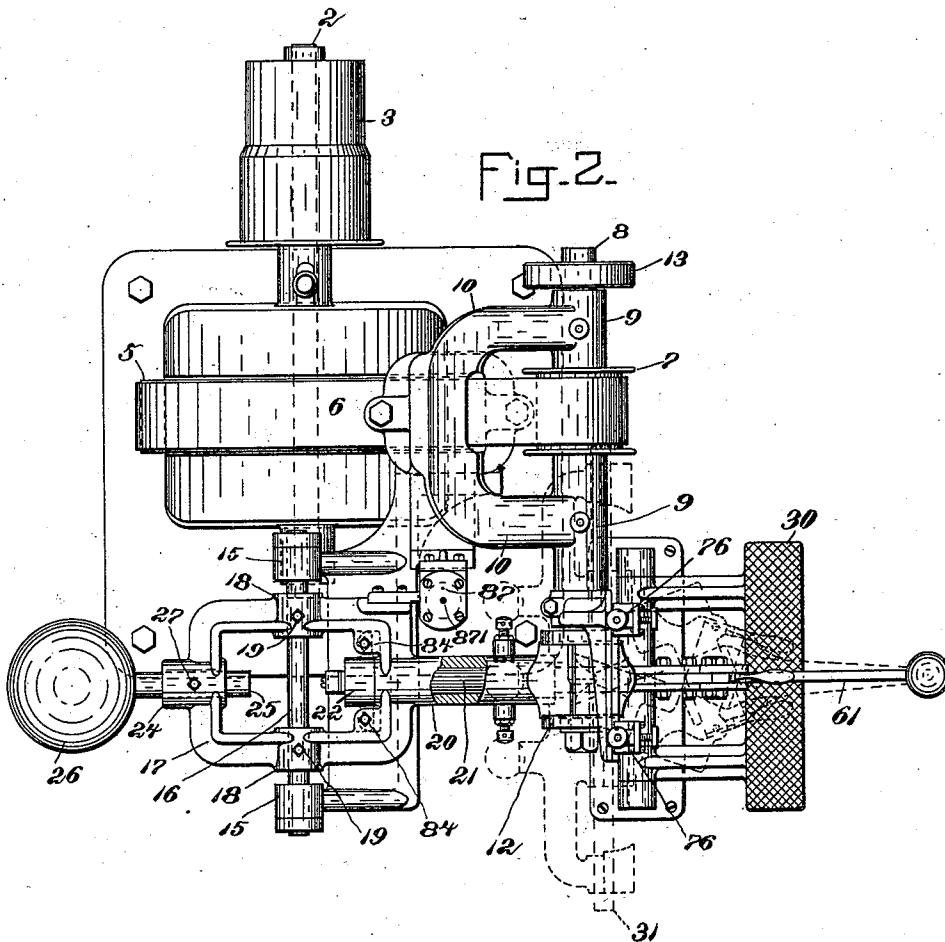
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WITNESSES:

Robert Wallace,
Arthur Randall,

INVENTOR:

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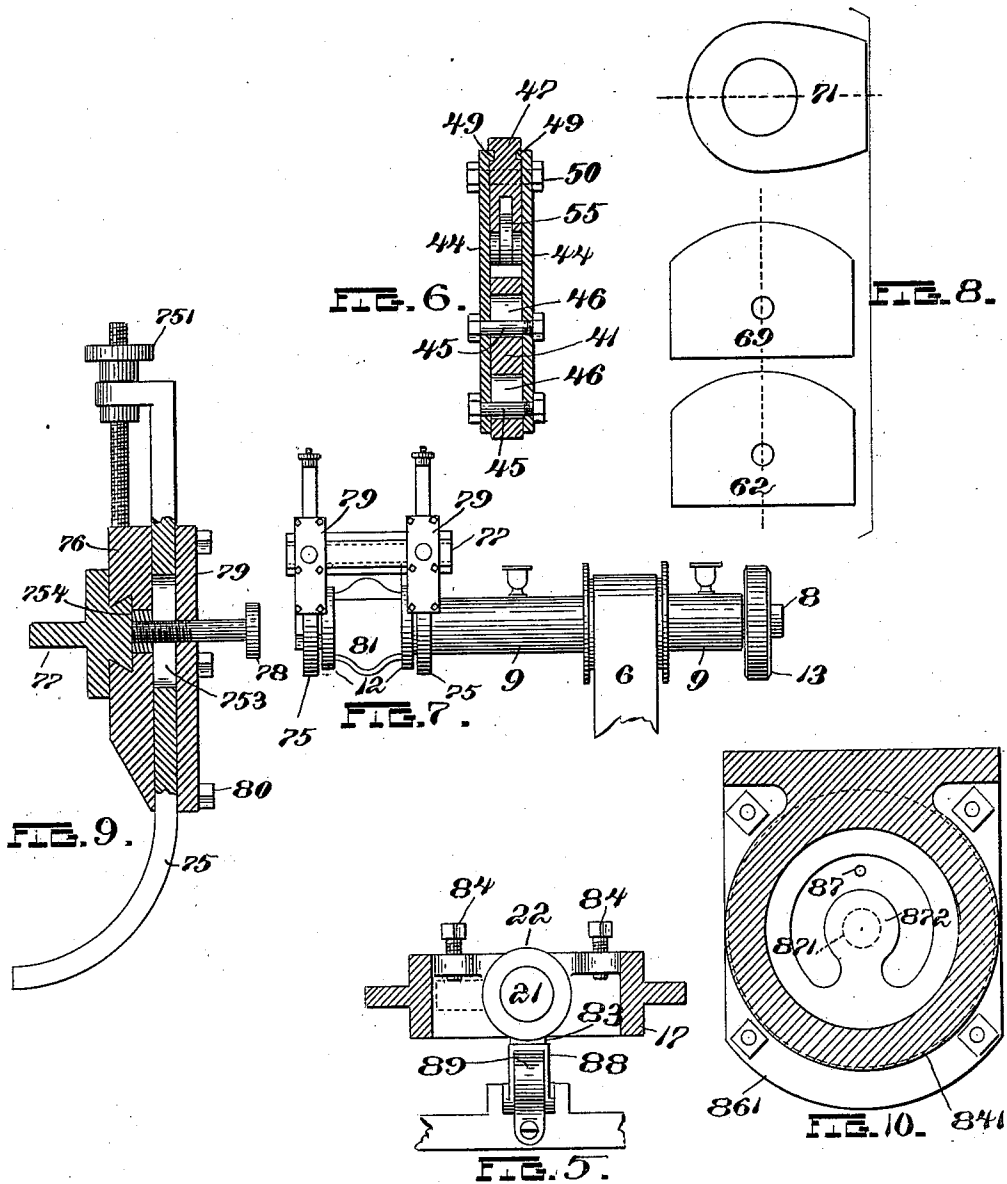
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Witnesses.

Arthur M. Randall,
Robert Wallace.

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Eugene H. Taylor,
by Mackend Calver Randall
his Attorneys.

UNITED STATES PATENT OFFICE.

EUGENE H. TAYLOR, OF LYNN, MASSACHUSETTS, ASSIGNOR OF ONE-HALF
TO ALBERT H. BREED, OF SAME PLACE.

MACHINE FOR TRIMMING HEELS.

SPECIFICATION forming part of Letters Patent No. 560,378, dated May 19, 1896.

Application filed March 4, 1895. Serial No. 540,406. (No model.)

To all whom it may concern:

Be it known that I, EUGENE H. TAYLOR, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Trimming Heels, of which the following is a specification, reference being had therein to the accompanying drawings.

Heretofore it has been customary to employ in machines for trimming or shaping wooden heels two rotating cutters revolving in opposite directions, the blank first being presented to the action of one of the said cutters and having thereby one side thereof trimmed or shaped from the front corner around to the middle of the back part of the heel and then being transferred to the other cutter, by which latter the trimming or shaping of the other side is effected. Two cutters rotating in opposite directions to each other have been employed because of the importance in trimming or shaping wooden heels of effecting the cutting in the direction of the grain of the wood, inasmuch as by so doing fewer heels will be chipped or fractured by the action of the cutters, a fairer and more uniform result will be obtained, and the work of the cutters will be made easier.

The object of the present invention is to provide a machine of simplified and improved character and construction, operating to trim each side of a wooden heel in the direction of the grain of the wood, and having only a single cutter-shaft.

The invention will first be described fully, with reference to the accompanying drawings, after which the characteristic features thereof will be pointed out more particularly, and distinctly defined in the claims at the close of this specification.

Figure 1 of the drawings is a view in side elevation of a machine embodying the invention in the best form thereof that has been devised. Fig. 2 is a view in plan of the said machine. Fig. 3 is a view showing the cutter-head and a heel-blank in position for being trimmed thereby. Fig. 4 is a sectional detail view showing mainly the work-clamp and certain adjacent and connected parts. Figs. 5 and 6 are views in section on lines 5 5

and 6 6, respectively, of Fig. 1. Fig. 7 is a view in elevation of the cutter-head and adjacent parts. Fig. 8 shows the various cams. Fig. 9 is a sectional view of one of the stop-fingers and its supporting devices. Fig. 10 is a view of the interior of one of the air-check cylinders.

1 is the main part of the machine-framing.

2 is the driving-shaft, journaled in bearings in the lower part of the machine-framing and having secured thereon a pulley 3 for receiving a driving-belt 4, Fig. 1, coming from a pulley on an overhead shaft (not shown) in customary manner.

5 is a belt-pulley fast on shaft 2.

6 is a driving-belt passing around the belt-pulley 5. 7 is a second belt-pulley, around which the said driving-belt 6 passes.

8 is the shaft carrying the cutter-head, the said shaft being journaled in bearings 9 9 on the arms 10 10 of the upright portion 11 of the machine-framing and having the belt-pulley 7 made fast thereon.

12 is the cutter-head carried by the shaft 8.

13 is a small fly-wheel or balance-wheel fast on the shaft 8 to store up momentum and insure evenness in the running of the cutter-head.

14 is a laterally-extending bracket, which is secured to the upright portion 11 of the machine-framing.

15 15 are bearings provided on the bracket 14 for the pivotal shaft 16 of the swinging arm 17. The main portion or body of the said arm 17 is yoke-shaped, as shown. The sides of the yoke are formed with hubs 18 18 to fit upon the pivotal shaft 16, and the shaft and yoke are secured together by clamping-screws 19 19, passing through threaded holes in the said hubs 18 18 and bearing by their inner ends against the surface of the shaft 16. This mode of connecting arm 17 to its pivotal shaft facilitates the adjustment of the arm laterally, so as to bring the parts carried thereby into proper position relatively to the cutter-head. The front portion 20 of arm 17—namely, the end which is toward the place of the operator—which is at the right-hand side in Figs. 1 and 2, is bored out to receive the pin or shaft 21 and afford bearing therefor, the said pin or shaft being free to turn about

its axis therein within certain prescribed limits, as will be made to appear.

22 is a collar fitted upon the rear end of the pin or shaft 21, where it projects from the rear end of the portion 20 of the arm 17 and contacting with the said end of the portion 20 to prevent forward movement of the pin or shaft 21.

23 is a clamp-supporting frame fitted upon the forward end of the pin or shaft 21, where it projects from the forward end of the portion 20 of arm 17 and contacting with the said end of the portion 20 to prevent rearward movement of the pin or shaft 21. The collar 22 and upper end of the frame 23 cooperate, as will be perceived, in holding the pin or shaft 21 from endwise movement in either direction. To the frame 23 are applied the work-holding clamp and the adjuncts thereof, as presently will be described.

24 is a hub at the rear end of the yoke of the frame 17. To the hole through the same is applied the pin or stem 25, projecting from the weight 26, the said pin or stem being clamped in the said hole by the screw 27, the stem of which is fitted to a threaded hole in the side of the hub, while the inner end thereof bears against the surface of the pin or stem 25. The weight 26 is employed to assist in partially counterbalancing the weight of the parts in front of the pivotal shaft 16, and it is made adjustable toward and from the said shaft, as is clearly evident in the drawings, to enable its effect to be varied.

28 is a connecting-rod, which is united at its upper and lower ends by gimbal or universal joints 29 29 to the frame 23 and the rear arm of a treadle 30, respectively, as is shown clearly in Fig. 1.

31 is a short shaft applied to the frame 23 and supported therein at right angles to the pin or shaft 21. When the parts are in their position of rest, as in Fig. 1, the frame 23 hangs from the pin or shaft 21 with the shaft 31 in a nearly vertical position, the said frame and said shaft inclining a little rearwardly and downwardly.

32 is a lug on the frame 23, in which is formed a bearing for one end of the shaft 31. The shaft 31 is free to turn, and also to move endwise to a slight extent in the said bearing.

33 is a second lug on the frame 23, it having a hole therethrough, and having fitted to the said hole a sleeve 34, in which the upper end of shaft 31 in Fig. 1 takes bearing. The slot 35, opening from the hole in lug 33, receives the lateral projection or wing 36 on the sleeve 34, and thereby the sleeve is prevented from turning in the said hole, although it is left free to move endwise in the latter.

37 is a collar on the shaft 31, at the lower end of the sleeve 34, the said collar being fixed in place by the pin 38.

39 is a small head or support fixed on the upper end of shaft 31 and having the work-clamp pivotally mounted thereon. The sleeve 34 fits between the under side of the said head

or support 39 and the upper side of the collar 37, and thereby is caused to partake of the longitudinal movements of the shaft 31 when such movements occur.

40 40 are side pieces or cheek-pieces on the head or support 39. Between them is placed the lower member 41 of the work-clamp, the rear or inner end of the said member 41 being connected with the said side pieces by a pivotal pin 42. The side pieces guide and steady the work-clamp as it is swung about the pivotal pin 42.

43 43 are ribs formed on each side of the vertical web or plate of the clamp member 41. These webs are alike on both sides of the said web or plate.

44 44 are plates applied to the said vertical web or plate on the opposite sides thereof and secured thereto by bolts 45 45, the said bolts passing through transverse slots 46 46 in the web or plate and the plate on each side being guided by the ribs 43 43, as aforesaid.

47 is a block fitted between the upper ends of the plates 44 44, the said block having longitudinal grooves 48 48 formed in its opposite sides to receive corresponding ribs 49 49 on the plates 44 44, whereby to insure the placing of the block in proper position between the plates and guard against any liability of the block to become shifted into improper position under strain, the said ribs and grooves preventing the block from becoming misplaced when being adjusted longitudinally between the said plates. The block is secured between the plates by bolts 50 50, which clamp the said parts together, longitudinal slots 51 51 in the block being provided to permit the longitudinal adjustment which has been referred to.

52 is the upper clamp member, it being pivoted between cheek-pieces or side pieces 53 53, that are formed on the block 47. 54 is the pivotal pin for the said clamp member. The tail portion of the said clamp member occupies a position between the said cheek-pieces and is acted upon by a spring 54, placed in a recess in the block, the said spring acting with a tendency to move the jaw on the said clamp member away from the jaw of the lower clamp member.

55 is an eccentric or cam lever, pivoted on a pin 56 passing through the same and the cheek-pieces of the block and acting upon the tail of the clamp member 52. When the said cam-lever is turned by means of its handle, it closes the jaw of the upper clamp member against that of the lower one or allows the spring 54 to move the upper clamp member in the opposite direction, as will be obvious.

57 57 are the jaws of the two clamp members, and 58 is a gage on the lower clamp member to determine the position of the blank when it is placed between the said jaws, the said gage being secured in place by a clamping-screw 59 and washer 60. As will be perceived, the work-clamp is constructed to permit of an adjustment of the jaw of the upper

clamp member toward and from the jaw of the lower clamp member to accommodate blanks of different thicknesses, and also is adjustable in the direction of its length relatively to the said jaw of the lower member to meet the requirements of heels of different shapes and sizes.

61 is an extension or handle on the lower clamp member, which is provided for use in operating the work-clamp, as will be made to appear hereinafter.

62 is a cam-piece for occasioning movement of the shaft 31 in the direction of its length. This cam-piece is secured to the lug 32 by a screw or screws 63.

64 is a collar that is made fast upon the shaft 31 above the lug 32 by means of a screw 65 passing through a threaded hole in the collar and taking bearing at its inner end against the surface of the shaft. A roller 66 is mounted upon a pin 67, projecting from this collar.

68 is a spring placed upon the shaft 31 between the collar 64 and the under side of the lug 33 and operating to move the shaft 31 lengthwise in a manner to hold the roller 66 pressed against the surface of the cam-piece 62. As will be understood, the effect of the combined action of the cam-piece 62 and spring 68 is to move the shaft 31 and parts carried thereby, including the work-clamp, in the direction of the length of the shaft 31 whenever the latter is rotated partially about its axis by power applied by hand to the handle 61.

69 is a cam-piece, which is secured by a screw or screws 70 to the wing 36 of the sleeve 34, and 71 is a projection on the lower clamp member that is arranged to coact with the surface of the said cam-piece, the said projection 71 being held in contact with the said surface by means of a spring 72, one end of which is connected to a suitable part of the lower clamp member and the other end to an arm 73 of the collar 64. As will be apparent, when the work-clamp is turned around the axis of the shaft 31, as aforesaid, by power applied to handle 61 the cam-piece 69 and spring 72 will cooperate in rocking the work-clamp about the pivotal pin 42. In consequence of being fitted to shaft 31 between the collar 37 and the under side of the head 39 the sleeve 34 is carried with the shaft 31 in the endwise movement of the latter in either direction. The cam-piece 69 necessarily partakes of such motion. From this it results that in laying out such cam-piece it is necessary only to give it such form as will produce the required movement of the work-clamp about its pivot. This simplifies very much the calculations and work which are necessary in laying out such cam-piece. If the said cam-piece did not partake of such movement it would be necessary in laying out the same to take into account the motion produced by the cam-piece 62 and to shape cam-piece 69 accordingly.

74 is a third cam-piece. It is fast to the under side of the small head or support 39 and therefore turns in unison with the shaft 31 and work-clamp.

75 75 are fingers having curved lower ends constituting stops for coaction with cam-piece 74 after the parts have been shifted into the dotted-line position in Fig. 1. These stops are located at opposite ends of the cutter-head and are carried by blocks 76 76, which latter are fitted to a dovetailed bar 77, extending horizontally above the cutter-head and parallel with the shaft of the latter. The blocks 76 76 are secured in the desired positions at the opposite ends of the cutter-head after being adjusted as required by screws 78 78. The straight portions of the fingers 75 75 extend through the blocks 76 76 and project above the latter, being provided with adjusting screws and nuts 751 752, by means of which to secure the desired positions of the curved lower ends of the fingers. The fingers are held in the grooves that are provided for their reception in the blocks by means of cap-plates 79 79, which are secured to the blocks by screws 80 80.

81 81 are the cutter-blades that are applied to the cutter-head.

82 is a heel-blank.

Normally the swinging arm 17 occupies a position remote from the cutter-head, as shown in full lines in Fig. 1, and the clamp-supporting frame 23, that is pivotally connected with the forward end of the said arm 17, gravitates into the vertical position in which it is represented in full lines in the said figure. In this position of the parts the blanks are inserted successively into the clamp, and are removed therefrom after being trimmed or formed. By means of treadle 30 and connecting-rod 28 the arm 17 is swung toward the cutter-head into the dotted-line position in Fig. 1. When the pressure on the treadle is relieved, the arm swings down into the full-line position again. In the latter position the jaws of the clamp and the blank occupy a horizontal position. In order to present the edge of the blank properly to the cutter-head, the clamp and blank must be turned through an angle of ninety degrees before the blank is carried up to the cutter-head. Turning them to the said extent places them in a vertical position. For the purpose of permitting this the clamp-supporting frame 23 is connected pivotally with the forward end of arm 17, as aforesaid. The upper end of the connecting-rod 28 is joined to the frame 23 at a point below the pivotal pin or shaft 21 and vertically in line therewith in Fig. 1. At the same time that pressure is applied to the treadle 30 to cause frame 17 to rise, slight lateral pressure is communicated by hand or otherwise to the handle 61, carrying the joint between rod 28 and frame 23 out of line with the center of pin or shaft 21. The continued upward pressure that is transmitted through the rod 28 swings the frame 23 still farther

around the pivotal pin or shaft 21 in the direction of the lateral pressure, which is referred to above, until a projection 83, applied to the collar 22, brings up against a stop, which is constituted by the lower end of a screw 84, that is applied to a lug of the frame 17. The frame 23 and its shaft 31 now occupy a position which presents the edge of the blank to the cutter-head, as indicated in dotted lines in Fig. 1. The arm 17 continues to swing upwardly until the edge of the cam-piece 74 comes into contact with one of the stop-fingers 75 75 adjacent to the cutter-head. The blank having been presented thus to the action of the cutter-head, the clamp is turned around the axis of the shaft 31 by hand-pressure applied to handle 61, and the trimming or forming of the blank is thereby effected around one side thereof to the middle of the rounded portion or back. This having been done the parts are allowed to move away from the cutter-head, and, as soon as they have reached the full-line position in Fig. 1 again, the frame 23 is swung to the opposite side of the vertical and carried up by the pressure transmitted through the treadle and connecting-rod into a horizontal position diametrically opposite to that first assumed, the arm 17 being thereby a second time caused to rise and the upward movement continuing until the edge of cam-piece 74 contacts with the other stop-finger 75. The work-clamp is now turned by hand, as before, to present the other half of the heel to the action of the cutter-head. After this the parts are allowed to descend into the full-line position in Fig. 1, the trimmed or formed blank is removed, a fresh blank is inserted into the clamp, and the operations are repeated.

When the parts are in the dotted-line position in Fig. 1 and the work-clamp is moved by means of its handle 61, as aforesaid, the cam-piece 62 acts to determine the movement of the clamp and blank lengthwise of the cutter-head, the cam-piece 69 determines the rocking movement of the same relatively to the cutter-head, and the cam-piece 74 regulates the approach of the same to the cutter-head.

As will be perceived, a leading characteristic of the foregoing construction is a work-clamp mounted on a support, which is movable toward and from a cutter-head and reversible on said support, so as to permit first one side or half of a heel-blank to be presented to the action of the cutter-head and then the other side or half thereof to be presented thereto. Incidental to the reversibility of the work-clamp is the double-acting or reversible construction of the cutter-head and of the cam-pieces 62, 69, and 74. The construction of the cutter-head is shown clearly in Fig. 3. This is made of greater length than usual, and the edges of the blades 81 81 thereof are each formed at the middle thereof with the convex portion 122, while on both sides of the convexity are the like concavities

123 123. As is apparent from Fig. 3, the convexity 122 acts in both positions of the heel-blank, while one of the concavities is operative when the heel-blank is in the full-line position and the other thereof is operative when the heel-blank is reversed, as in dotted lines. The reversibility of the cam-pieces is secured by forming the same of symmetrical pattern on each side of the middle line thereof, as shown.

The improved machine enables the entire work of trimming or forming both sides of a heel-blank to be performed by a single cutter-head.

Fig. 2 shows in dotted lines the two opposite positions which the clamp is adapted to assume.

For the purpose of preventing jar or shock resulting from the arm 17, when moved to either extreme position with too much force, being brought to a standstill with too great suddenness, devices on the order of dash-pots preferably are employed. For example, 841 841 are cylinders mounted on the upright portion of the machine-framing. 85 85 are pistons playing in the said cylinders and connected to opposite ends of a bar 86, which is connected with the arm 17. In the movement of the said frame the air within the cylinders is compressed between the latter and the heads 861 861 of the cylinders, small ports 87 being provided in the said heads to permit compressed air to escape gradually.

871 are inlet-ports for air, and 872 is a valve of well-known character applied to each of said inlet-ports.

In order to guard against the parts being carried upward toward the cutter-head in an improper position, the projection 83 on the collar 22 of the pivotal pin or shaft 21 of the frame 23 is formed with a hook constituting a catch to engage with a latch 88, that is pivoted to the machine-framing. The said latch is pressed forward by a spring 89 into position to engage with the hook of the projection 83. Whenever in the lowered position of arm 17 the frame 23 hangs in the vertical position in which it is shown in Fig. 1, the latch 88 engages with the hook of the projection 83. In consequence of this engagement the arm 17 cannot be raised until after the frame 23 has been swung laterally to a slight extent in either direction. This swinging movement carries the hook of projection 83 out to one side of the latch 88, thereby disengaging the one from the other. It also carries the point of connection between the rod 28 and frame 23 off to one side of the vertical line which passes through the axis of pin or shaft 21, and thus insures that as the parts are pushed upward the pressure shall swing frame 23 around into a horizontal position. Each stop-finger 75 75 is slotted longitudinally, as at 753, for the passage therethrough of the stem of the screw 78, which holds the corresponding block 76 in adjusted position on bar 77. The rear part of the block 76 is

recessed and receives a nut 754, which is held from rotating when the screw 78 is turned by its engagement with the sides of the recess.

When screw 78 is turned, its inner end is caused to project beyond nut 754 and bind against bar 77, while at the same time the nut is forced outwardly against the stop-finger. Thereby the block is secured in place on the bar, and the stop-finger is gripped and held from undesired vertical movement.

When the parts of the machine have been adjusted so as to permit heels of a different size to be made, it is desirable oftentimes to be able to reset the machine quickly to permit it to again make heels of the preceding size. To accomplish this, I graduate one of the cheek-pieces 40, as also one of the plates 44, the block 47, and the gage 58, as shown, or, as will be clear, the graduations may be on the parts adjacent to these said parts, if desired. By means of these graduations the machine may be instantly set or adjusted to make a heel of any desired size or form. This arrangement also permits a record to be kept, so that if an old order is to be duplicated the record can be referred to and the machine instantly set to make heels of the desired size.

I claim as my invention—

1. In a machine for trimming or shaping heels, the combination with a cutter-head of a work holder or clamp, its shaft, and a support or frame containing bearings for said shaft, with a carrier for the said support or frame movable toward and from the cutting position, and on which the said support or frame is adapted to be shifted laterally into opposite positions at one side of the cutter-head, to thereby reverse the work holder or clamp and the heel held thereby, substantially as described.

2. In a machine for trimming or shaping heels, the combination with a single cutter-head, of a work holder or clamp, its shaft, a support or frame containing bearings for said shaft, and a carrier for the said support or frame, movable toward and from the cutting position, and on which the said support or frame is adapted to be shifted laterally into opposite positions at one side of the cutter-head to thereby reverse the work holder or clamp and the heel held thereby relatively to the cutter-head, substantially as described.

3. In a machine for trimming or shaping heels, the combination with a cutter-head of a work holder or clamp, its shaft, and a support or frame containing bearings for said shaft, with a carrier for the said support or frame, movable toward and from the cutting position, and on which the said support or frame is pivotally mounted and adapted to be swung laterally parallel with the cutter-head into diametrically-opposite positions at one side of the cutter-head to thereby reverse the position of the heel as it is presented to the cutting action, substantially as described.

4. In a machine for trimming or shaping

heels, the combination with a cutter-head having blades provided with double or reversely-curved cutting edges, of a work holder or clamp, a support or frame on which said work holder or clamp is pivoted to enable successive portions around the edge of the heel to be progressively presented to the cutting action, and a carrier for the said support or frame, movable toward and from the cutting position, and on which the said support or frame is adapted to be shifted laterally into opposite positions at one side of the cutter-head, to thereby reverse the work holder or clamp, and the heel held thereby, relatively to the cutter-head, substantially as described.

5. In a machine for trimming or shaping heels, the combination with a work holder or clamp, a support or frame therefor, and a carrier movable toward and from the cutting place and having the said support or frame connected pivotally therewith, of a treadle, and a connecting-rod joined to the said support or frame eccentrically with relation to the pivot of the latter, substantially as described.

6. In a machine for trimming or shaping heels, the combination with a work holder or clamp, a support or frame therefor, and a carrier movable toward and from the cutting place, and having the said support or frame connected pivotally therewith, of a treadle, a connecting-rod joined to the said support or frame eccentrically, and detent devices to prevent upward movement of the carrier until after the support or frame has been swung laterally, substantially as described.

7. The combination with a work holder or clamp, and its shaft on which it is pivotally mounted, of a fixed cam acting to move the said shaft longitudinally, a second cam acting to swing the work holder or clamp on its pivot, and means to cause said second cam to move in unison with the shaft in its lengthwise movement, substantially as described.

8. The combination with a work holder or clamp, and its shaft on which it is pivotally mounted of a fixed cam acting to move the said shaft longitudinally, a sleeve fitted to said shaft, means to compel said sleeve to move in unison with the shaft in its lengthwise movement, means to hold the sleeve from rotating, and a second cam connected with said sleeve and acting to swing the work holder or clamp on its pivot, substantially as described.

9. In a machine for trimming heels, the combination with cutter devices, and clamp supporting and operating devices, of a work holder or clamp having opposing jaws, a support to which one of said jaws is pivotally connected, means to adjust said support in the direction of the length of the jaw, and means to adjust the pivotal support of said jaw toward and from the other jaw, substantially as described.

10. The combination with the cutter-head, the stops adjacent to the ends thereof, and means for adjusting the said stops in the direction of the length of the cutter-head, of a
5 carrying-arm, means for adjusting the same transversely a reversible clamp-support carried by said arm, and a work holder or clamp mounted on said clamp-support and provided

with a cam for engagement with said stops, substantially as described. 10

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

EUGENE H. TAYLOR.

Witnesses:

WM. A. MACLEOD,
ROBERT WALLACE.