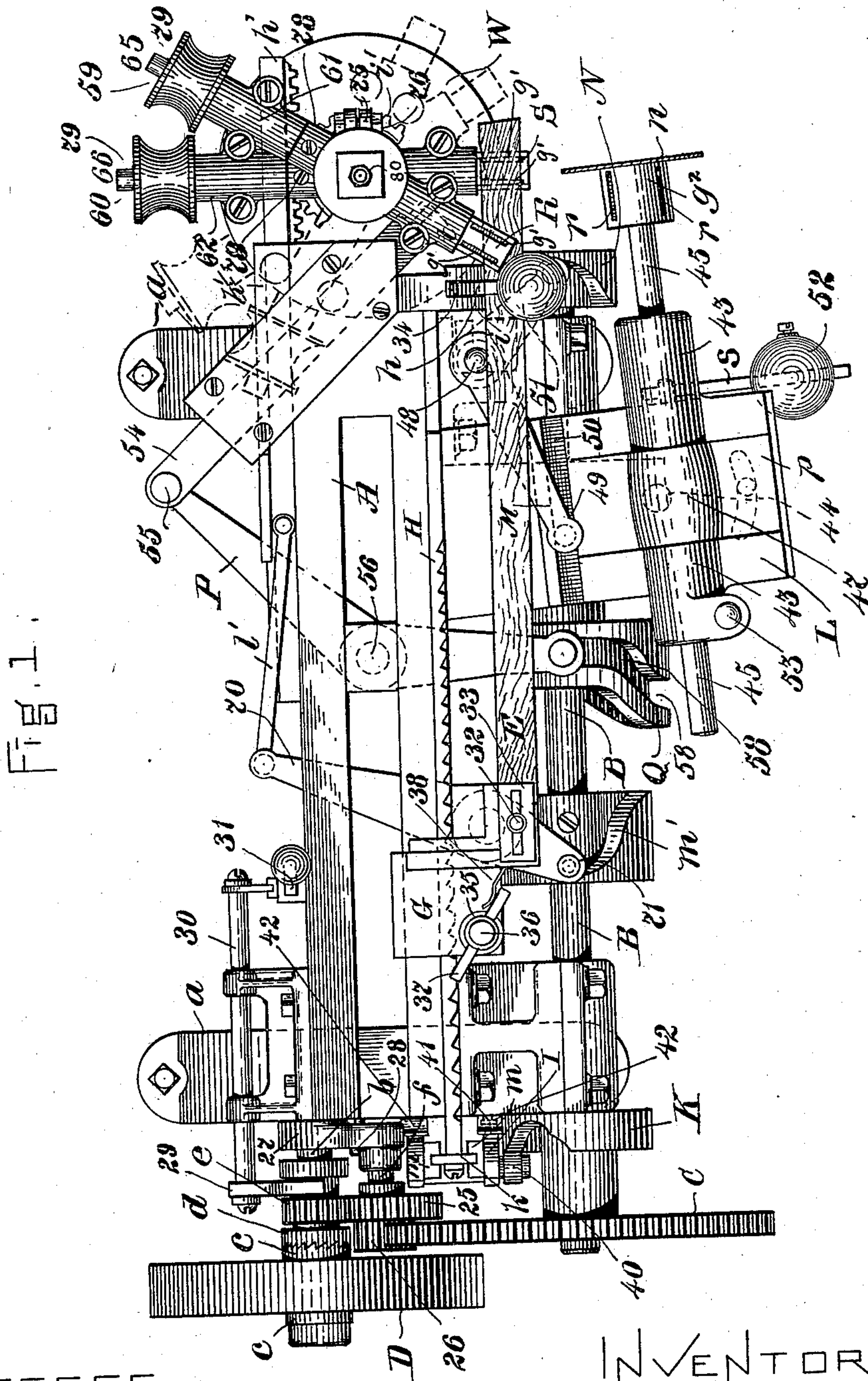


4 Sheets—Sheet 1.

No. 580,933.

Patented Apr. 20, 1897.



WITNESSES.

H. Henry Marsh.
B. L. Marden.

INVENTOR,

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(No Model.)

4 Sheets—Sheet 2.

L. H. DWELLEY.
MACHINE FOR MAKING WOODEN HEELS.

No. 580,933.

Patented Apr. 20, 1897.

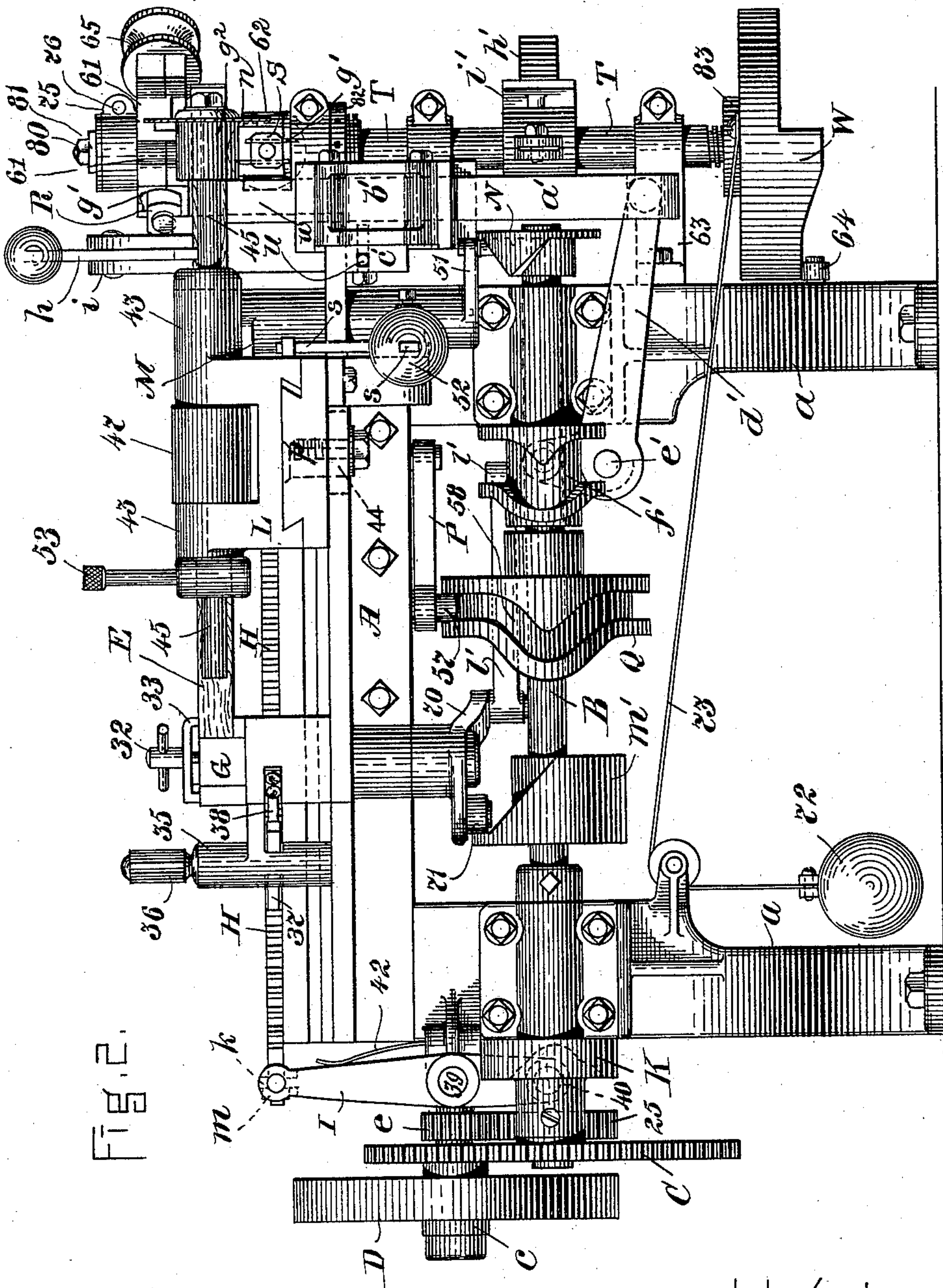


FIG. 2.

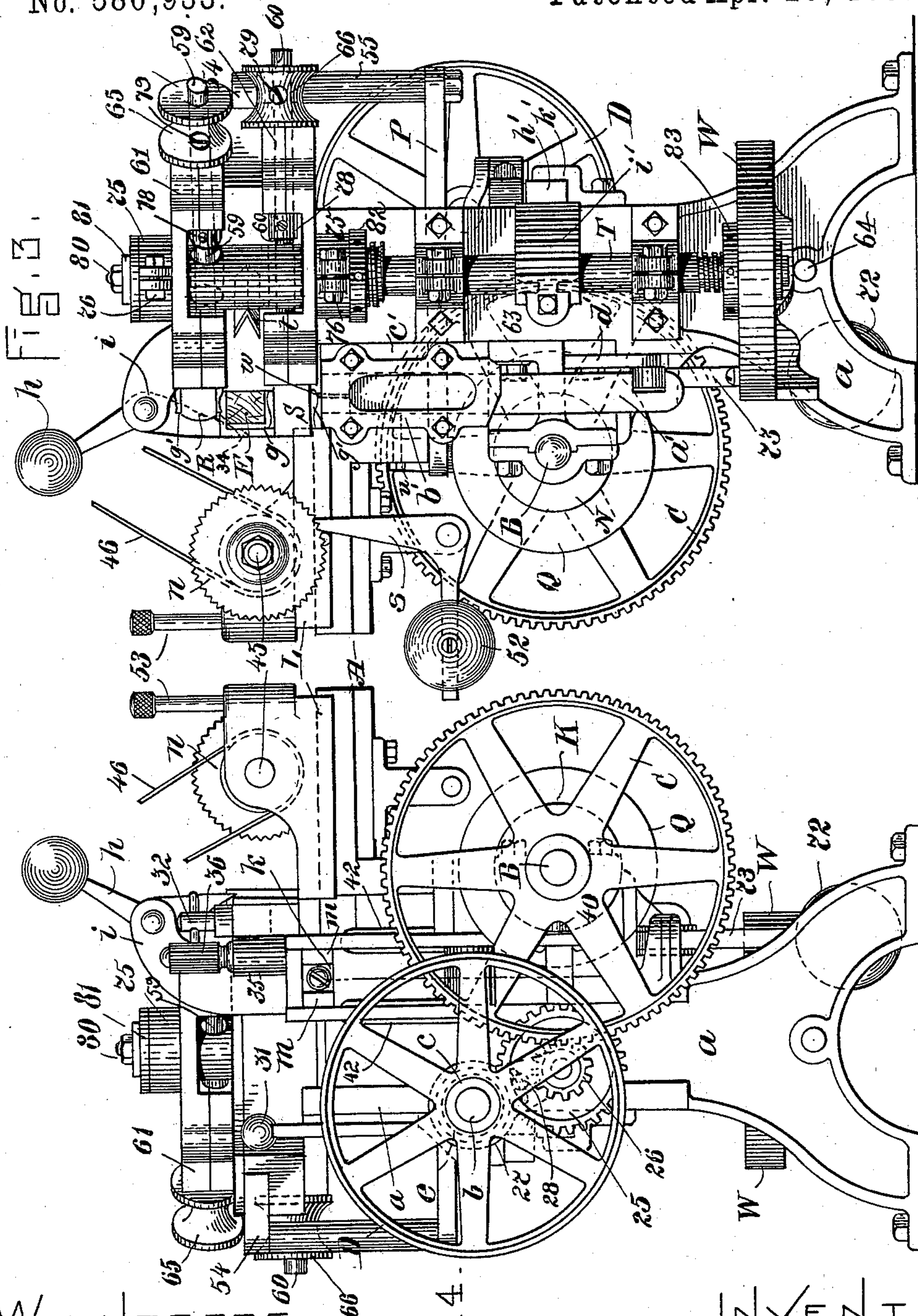
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4 Sheets—Sheet 3.

No. 580,933.

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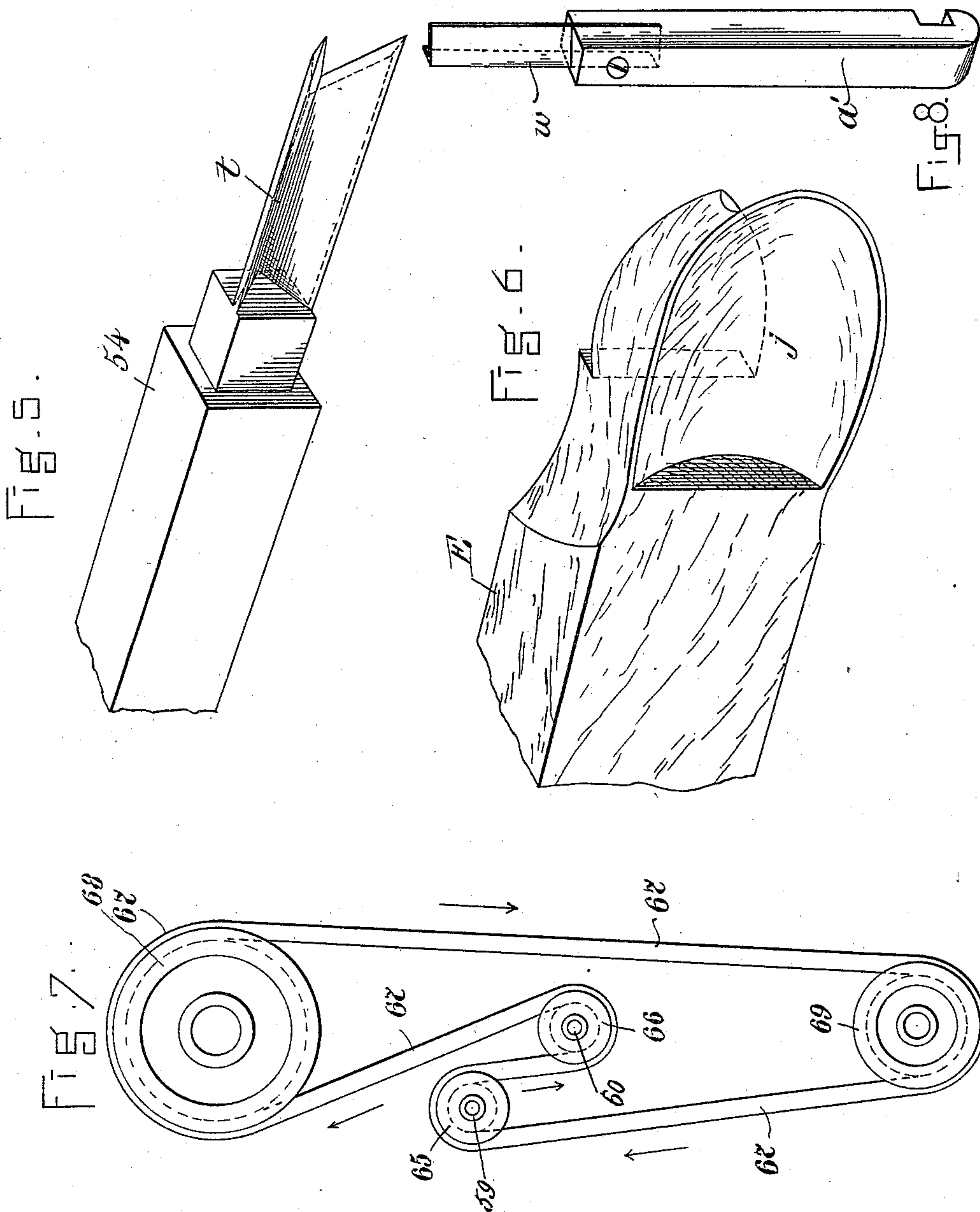
(No Model.)

4 Sheets—Sheet 4.

L. H. DWELLEY.
MACHINE FOR MAKING WOODEN HEELS.

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Patented Apr. 20, 1897.



WITNESSES.

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UNITED STATES PATENT OFFICE.

LUCIUS H. DWELLEY, OF FOXCROFT, MAINE, ASSIGNOR OF ONE-HALF TO
JOHN J. FOLSOM, OF SAME PLACE.

MACHINE FOR MAKING WOODEN HEELS.

SPECIFICATION forming part of Letters Patent No. 580,933, dated April 20, 1897.

Application filed January 13, 1896. Serial No. 575,352. (No model.)

To all whom it may concern:

Be it known that I, LUCIUS H. DWELLEY, a citizen of the United States, residing at Foxcroft, in the county of Piscataquis and State of Maine, have invented certain Improvements in Machines for Making Wooden Heels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan of my improved machine for making wooden heels. Fig. 2 is an elevation of one side of the same. Fig. 3 is an elevation of the front end of the machine. Fig. 4 is an elevation of the rear end of the machine. Fig. 5 is a perspective view of the angular cutter for removing a portion of the surplus wood from the rear end of the wooden bar from which the heels are made. Fig. 6 is a perspective view of the wooden bar from which the heels are made, showing a heel at the end of said bar and ready to be cut off by the saw, which is the last operation performed by the machine. Fig. 7 is a diagram illustrating the method of arranging the belt which drives the pulleys on the shafts to which are secured the cutter-heads which carry the heel-shaping cutters. Fig. 8 is a view of the cutter for shaving off the side of the wooden bar which forms the bottom of the heel.

In machines for making wooden heels as heretofore constructed blanks of the proper size for the heels are first cut from a strip of wood and then clamped by hand one at a time in a suitable holder before the operation of shaping the sides and rear end of the heel can be commenced, the heel after being thus shaped being removed from the holder and replaced by a fresh blank. After the heels have been thus far shaped they are placed one at a time in another machine, which forms the concavity at the top of the heel, and after being removed from this machine the bottom of the heel is sawed or planed off in another machine at an angle and at a proper point to render the heel of the desired height. The preparation and handling of the blanks and the separate operations thereupon by the said

several machines occupy considerable time, thereby increasing the cost of production.

My invention has for its object to provide a single machine which will produce a finished heel at one operation, whereby a great saving in time and labor is effected; and to this end my invention consists in a machine in which the heel is formed at the end of a wooden bar and then severed therefrom, after which the bar is automatically fed forward sufficiently for another heel, which is then produced in a similar manner, the wooden bar which serves as a holder while its end is being operated upon being fed forward after each operation until as many heels have been made therefrom as its length will permit, as hereinafter set forth.

My invention also consists in certain novel combinations of parts and details of construction, as hereinafter fully described, and pointed out in the claims.

In the said drawings, A represents the bed of the machine, supported on legs *a a* in suitable bearings, secured to which is supported a cam-shaft B, located on one side of the machine below the level of the bed and carrying a series of cams, to be hereinafter described.

To the outer end of the cam-shaft is secured the driving-gear C, which receives its motion from the driving-pulley D, which rotates on a stud *b*, projecting from the adjacent leg *a*, said pulley being held in place on said stud by a collar at each end of its hub *c*, which collars are secured in place by screws or pins. The inner end of the hub *c* is provided with ratchet-teeth which engage corresponding ratchet-teeth on a sleeve *d*, sliding on said stud *b* and carrying a pinion *e*, which meshes with a gear 25, revolving on another stud *f* and carrying a smaller gear 26, which meshes with the large gear C on the cam-shaft B, thus driving the latter. The gears 25 and 26 are mounted on a plate 27, swinging on the stud *b* as a center and made adjustable by means of a clamping-screw 28, working within a slot in said plate, and when it is desired to change the number of revolutions of the cam-shaft the gear 26, which is made removable from the hub of the gear

25, is replaced by another small gear having a different number of teeth.

The sleeve *d* is provided with an annular groove which is engaged by a fork 29 on a sliding shipper-bar 30, provided with an operating-lever 31, weighted at its upper end, whereby the shipper-bar is held in place when thrown over to either side, and by the employment of the clutch mechanism above described the cam-shaft and mechanism driven thereby can be instantly stopped or started, as required.

E represents the wooden bar from which the heels are to be made. This bar is of rectangular form in cross-section, being wider than it is thick, and is placed in the machine with its wider sides in vertical planes, where it is clamped at its rear end by means of a screw 32 and plate 33 to a carrier G, which slides horizontally in suitable guideways on the bed A, the front portion of the wooden bar passing through a guideway *g* in a casting secured to the said bed A. This guideway *g* is larger than the bar, to enable it to pass freely through the same, and said bar is held firmly in place within said guideway by the lower end of a weighted lever *h*, which bears upon one corner and presses the bar against the side and bottom of the guideway, but not with sufficient friction to interfere with its feed. The lever *h* is fulcrumed at *i*, and its lower end passes through a slot 34 in the outer upper corner of the guideway. When the wooden bar E is to be moved by hand to enable an imperfect portion to be cut out, the lever *h* is thrown back out of the way, so that the bar can be easily adjusted to the desired position. The top of the carrier G is provided with a hub 35, within which is loosely fitted a vertical shaft 36, carrying a dog or pawl 37, which lies within an opening in the side of the hub. The pawl 37 is kept by a flat spring 38 in contact with a toothed feed-bar H, which slides in suitable horizontal guides on the bed A. The rear end of the feed-bar H is secured to a plate *k*, which slides in vertical grooves in the heads of two pins *m m*, the shanks of which are free to turn in the side pieces of an upright lever I, fulcrumed on a stud 39, projecting from one of the legs *a*. The lower end of this lever I carries a roll 40, which is acted upon by a cam K on the cam-shaft B to move the lever and toothed feed-bar H in the proper direction to produce the feed of the wooden bar, which is thus at each complete revolution of the cam K pushed forward a sufficient distance for a single heel.

The movement of the lever I toward the cam is limited by a screw 41, whereby its throw may be varied to increase or diminish the feed of the wooden bar for heels of different lengths. A spring or weight, preferably a spring 42, as shown, is employed to return the lever I after being moved by the cam. This cam is so shaped as to produce a sudden

feed of the wooden bar and then permit it to remain at rest during the remainder of the operation.

After the wooden bar E has been properly placed in the machine its end is cut off at a slight angle by a small circular saw *n*, the arbor 45 of which is mounted in bearings 43 on a carriage L, sliding on a dovetailed guideway *p*, adjustable in the arc of a circle on a center pin 44, as shown in Figs. 1 and 2, to permit the saw to be set to cut at the desired angle, said guideway *p* being clamped, when adjusted, by a screw passing through a slot, as shown dotted in Fig. 1.

Adjacent to the saw *n* and secured to the saw-arbor 45 is a cutter-head *g*², provided with cutters *r r*, suitably shaped to form the concavity *j*, Fig. 6, at the top of the heel, so that when the saw is brought up to cut off the end of the bar or the finished heel formed thereupon, as hereinafter described, the cutters *r* will form the concavity *j* for the heel to be next formed at the end of the bar. The saw *n* and cutter-head *g*² are rotated by a belt 46, running over a pulley 47 on the saw-arbor from a pulley on a counter-shaft overhead.

The saw-carriage L is reciprocated to bring the saw and cutters on its arbor into contact with the wooden bar by a lever M, mounted on a vertical rock-shaft 48 and carrying at its outer end a rectangular block 49, pivoted thereto and fitting within a slideway 50 on the carriage L. The rock-shaft 48 is actuated to move the carriage by a lever 51, secured to its lower end, which lever is actuated in one direction to bring the saw and cutters up to their work by a cam N on the cam-shaft B and in the opposite direction by a weight 52 at the end of a bell-crank lever *s*, the upper arm of which rests against a pin or projection on the carriage L. This construction permits the carriage to be moved forward by hand independently of the cam by taking hold of a vertical post or handle 53 in case it should be desired to cut out an imperfect portion of the wooden bar by reason of a knot or otherwise.

After the saw *n* and concaving or hollowing cutters *r* have completed their operations the outer end of the wooden bar which forms the rear of the heel is cut off at an angle of about forty-five degrees to correspond approximately to the inclination of this portion of the finished heel. This is accomplished by a reciprocating cutter-blade or chisel *t*, preferably having two sides arranged at an angle to each other, as shown in Fig. 5. This cutter *t* is secured to a bar 54, sliding in a suitable bearing attached to the bed A and arranged at a proper horizontal angle. To this bar 54 is secured a vertical stud 55, to the lower end of which is connected a lever P, fulcrumed at 56 to the under side of the bed A and carrying at its opposite end a cam-roll 57, actuated by a wheel Q, secured to the cam-shaft B and having a cam-groove 58,

whereby the bar 54 and cutter *t*, secured thereto, are reciprocated at the proper time, said cutter trimming off the surplus wood around the rear of the heel to facilitate the operation of the shaping-cutters, to be hereinafter described, which shape the sides and rear of the heel.

w represents a planing or shaving cutter which is mounted on a vertically-reciprocating bar *a'*, sliding in a bearing *b'*, secured to a bracket *c'*, attached to the side of the bed A, said cutter being adapted to cut or shave off at an angle the side of the wooden bar which forms the bottom of the heel, so that said bottom will be at the proper angle with respect to the top of the heel. The bearing *b'* is made adjustable transversely of the machine by means of a screw *u*, whereby the cutter is caused to reduce the height of the heel more or less, as may be required. The lower end of the reciprocating cutter-bar *a'* is connected with one end of a bell-crank lever *d'*, fulcrumed at *e'*, and carrying at its opposite end a roll which fits within a cam-groove in a cam-wheel *f'*, secured to the cam-shaft B, whereby the cutter *w* is reciprocated at the proper time.

g' g' represent the shaping-cutters for shaping the sides of the heel. Two sets of these cutters are employed, one set being adapted to operate upon the upper and the other upon the lower side of the wooden bar E, said cutters being secured to two cutter-heads R S, attached to the ends of two horizontal shafts 59 60, supported in bearings 61 62, secured at an angle to each other in different horizontal planes upon the upper end of a vertical shaft T, having its bearings in a casting 63, fastened to the adjacent leg *a*, said shaft T carrying at its lower end a cam-wheel W, which rests on a stationary pin 64, projecting from the leg *a*, which pin may be provided with a roller if desired, whereby as said shaft T is partially rotated by means to be hereinafter described it will be raised and lowered as desired to give the proper shape to the heel, the cam raising the shaft against its own weight and that of the mechanism carried thereby, which weight acts to carry the shaft down when permitted by the cam. The cutter-shafts 59 60 are provided with driving-pulleys 65 66, which are driven by an endless belt 67 from a suitable source of power, as shown in Fig. 7, which represents the preferred method of arranging the belt. This belt 67 passes over and is driven by an overhead pulley 68, thence passing down under an idle-pulley 69, and then up and over the pulley 65 of the shaft 59 of the upper heel-shaping cutters, thence down under the pulley 66 of the shaft 60 of the lower heel-shaping cutters, and thence up over the overhead pulley 68. This construction and arrangement of parts enables the two pulleys of the heel-shaping cutters to be raised and lowered without varying the tension on the driving-belt, thereby dispensing with a belt-tightening pulley, as would be required if a

separate driving-belt was employed for each pulley 65 66. Another advantage incident to the above arrangement of the driving-belt is that as both of the pulleys 65 66 are driven by a single belt and as but one set of shaping-cutters are operating at a time the weight and momentum of the pulley and shaft of the cutter-head not operating on the heel will be utilized to assist in driving the cutters on the other cutter-shaft while doing its work. As the vertical shaft T is partially rotated, the shaping-cutters *g' g'* are swung around the axis of the said shaft at the same time that they are raised and lowered by the longitudinal movement of this shaft produced by the action of the cam-wheel W, which causes the cutters to give the proper contour to the sides of the heel, one set of cutters acting in advance of the other, whereby one side of the heel is completely finished before the other set of cutters commence to operate upon the other side of said heel.

The vertical shaft T is preferably oscillated by a reciprocating rack-bar *h'*, which engages a toothed sector *i'*, secured to the said shaft T. This rack-bar *h'* slides in a suitable bearing *k'* and has pivoted to its rear end a connecting-rod *l'*, pivoted to a lever 70, carrying a cam-roll 71 and actuated in one direction by a cam *m'* on the cam-shaft B while the shaping-cutters *g'* are in operation and in the opposite direction to swing the cutters back to the position shown in full lines in Fig. 1 by a weight 72 and cord 73, the latter attached to the cam-wheel at the proper distance from its center.

Just before the wooden bar is fed forward for a fresh heel the shaping-cutters *g' g'* are swung back into the position shown in full lines in Fig. 1, ready to act upon the end of the bar as soon as it has been fed forward, and after arriving at the end of their swing or traverse in the opposite direction, as shown dotted in Fig. 1, the said cutters remain in that position until the finished heel has been cut off, the concavity formed at the end of the bar for the next heel, the end of the bar cut off or trimmed at an angle for the rear end of the heel by the cutter *t*, and the inner side of the bar shaved or planed off by the cutter *w* to form the bottom of the heel next to be made, as previously described, after which the shaping-cutters *g' g'* are again swung back into the position shown in full lines in Fig. 1, ready to act upon the bar to shape the heel as soon as the feed of the bar has taken place.

The bearings 61 62 of the shafts 59 60 of the shaping-cutters *g' g'* are each provided with a split hub 75 and clamping-screw 76, whereby they are secured to the upper enlarged end of the vertical supporting-shaft T in such manner that they can be vertically and horizontally adjusted upon said shaft independently of each other to enable the cutters *g' g'* to form heels of different sizes and shapes. The shafts 59 60 of the shaping-cutters, which pass loosely through the shaft T, are made adjust-

able in the direction of their length in order to project said cutters more or less to cause them to swing in a circle of greater or lesser diameter, thereby varying the form of the heel as may be desired. This adjustment is effected by loosening a collar 78 on the cutter-shaft and also a screw 79, which holds the pulley in place on said shaft, thereby permitting the shaft to be slid forward or backward within its bearing, as required, after which the collar 78 and pulley-screw 79 are tightened to hold the parts in their newly-adjusted positions.

The split hubs 75 of the bearings 61 62 are moved up and down by a nut 80 and washer 81 for the upper one and a nut 82 for the lower one, said nuts fitting threads on the shaft T.

The cam-wheel W is made adjustable vertically on the shaft T by a nut 83, fitting a screw-thread on the shaft, the cam-wheel being held, when adjusted, by a set-screw.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for making wooden heels, a pair of rotary shaping-cutters mounted on separate shafts arranged at an angle to each other in different planes, and swinging in the arc of a circle around a common center, whereby the cutters are caused to act successively on opposite sides of the heel to produce the desired contour, and said cutters having a reciprocating movement in a direction at right angles to the plane of their swinging movement, substantially as described.

2. In a machine for making wooden heels, a pair of revolving cutter-heads with their cutters mounted on shafts supported in bearings arranged at an angle to each other in different planes and swinging around a common center, said cutters acting in succession to shape the heel, and means for reciprocating said cutters as they are swung around said common center, substantially as set forth.

3. In a machine for making wooden heels, a pair of revolving cutter-heads with their cutters mounted on shafts supported in bearings arranged at an angle to each other in different planes and secured to a supporting-shaft, whereby both cutter-heads are swung around a common center, said cutters acting in succession to shape the heel, means for rotating the cutter-shafts, and a cam for producing a longitudinal movement of the supporting-shaft which carries the bearings of the cutter-shafts, whereby the cutters are reciprocated as they are swung around their common center to shape the heel, substantially as described.

4. In a machine for making wooden heels, a pair of revolving cutter-heads with their cutters mounted on shafts supported in bearings arranged at an angle to each other in different planes and secured to a supporting-shaft, so that both cutter-heads will swing around a common center, said bearings being made adjustable on said supporting-shaft

both vertically and horizontally to enable the cutters to shape heels of different sizes and shapes, means for rotating the cutters, reciprocating the same, and swinging them around a common center whereby they are caused to act successively in shaping the heel, substantially as set forth.

5. In a machine for making wooden heels, a pair of rotary shaping-cutters mounted on separate shafts arranged at an angle to each other in different planes, and swinging in the arc of a circle around a common center, whereby the cutters are caused to act successively on opposite sides of the heel to produce the desired contour, and said shafts being made longitudinally adjustable in their bearings to vary the distance of the cutters from the center around which they are swung, substantially as set forth.

6. In a machine for making wooden heels, the combination with a device for holding and guiding the wooden bar from which the heels are made and means for intermittently feeding said bar, of a cut-off saw having its arbor mounted upon a carriage sliding on ways adjustable in the arc of a circle to vary the angle of the cut, said saw-arbor being provided with a cutter-head and cutters arranged to form on one side of the wooden bar a concavity for the top of the heel next to be formed upon the end of said bar, and means for automatically reciprocating said carriage, substantially as described.

7. In a machine for making wooden heels, the combination of a device for holding and guiding the wooden bar from which the heels are made and means for intermittently feeding said bar, a reciprocating cutter operating at an angle upon the inner side of the bar to remove a portion of the surplus wood at the end of the same, a reciprocating cutter arranged at a slight angle to the longitudinal axis of the wooden bar and adapted to angularly shave off the side of said bar which forms the bottom of the heel, a pair of revolving cutter-heads with their cutters mounted on shafts supported in bearings arranged at an angle to each other in different planes and secured to a supporting-shaft, whereby both cutter-heads are swung around a common center to cause said cutters to act in succession to shape the heel, and means for rotating the cutter-shafts and oscillating the supporting-shaft to swing the cutter-heads, all operating substantially as described.

8. In a machine for making wooden heels, the combination with the revolving cutter-heads with their cutters mounted on shafts supported in bearings arranged at an angle to each other and secured to a supporting-shaft, whereby both cutter-heads are adapted to swing around a common center, of a toothed sector secured to said supporting-shaft, a rack-bar engaging said sector, and means for reciprocating the rack-bar, whereby the cutter-heads are swung around to cause the cutters to act successively in shaping the

heel, said swinging movement carrying the cutter-heads out of the way of the cutters which subsequently operate upon the heel, substantially as set forth.

5 9. In a machine for making wooden heels, the combination of a device for holding and guiding the wooden bar from which the heels are made and means for intermittently feed-
10 ing said bar, a reciprocating cutter operating at an angle upon the inner side of the bar to remove a portion of the surplus wood at the end of the same, a reciprocating cutter ar-
15 ranged at a slight angle to the longitudinal axis of the wooden bar and adapted to angularly shave off the side of said bar which forms the bottom of the heel, a pair of revolving cutter-heads with their cutters mounted
20 on shafts supported in bearings arranged at an angle to each other in different planes and secured to a supporting-shaft, whereby both cutter-heads are swung around a common center to cause said cutters to act in succession to shape the heel, means for rotating the cutter-shafts and oscillating the supporting-shaft
25 to swing the cutter-heads, a cam for producing a longitudinal movement of said supporting-shaft as it is oscillated, a saw mounted upon a sliding carriage adjustable in the arc of a circle for cutting off the finished heel, a

cutter on the saw-arbor adjacent to the saw for 30 forming on the face of the wooden bar a concavity for the top of the heel next to be formed upon the end of said bar, and means for automatically reciprocating the saw-carriage and rotating the cutter upon the saw-arbor, all 35 coöperating substantially as described.

10. In a machine for making wooden heels, the combination with a pair of revolving cutter-heads with their cutters mounted on separate shafts supported in bearings arranged at 40 an angle to each other in different planes and swinging around a common center, said cutters acting in succession to shape the heel and means for raising and lowering said cutters as they are swung around said center, of a driving-pulley and an idle-pulley placed one above 45 and the other beneath the pulleys of the said cutter-head shafts, and a belt passing over the said upper and lower pulleys and over one cutter-head pulley, and under the other, all 50 constructed to operate substantially as described.

Witness my hand this 10th day of December, A. D. 1895.

LUCIUS H. DWELLEY.

In presence of—

P. E. TESCHEMACHER,
B. L. MARDEN.