

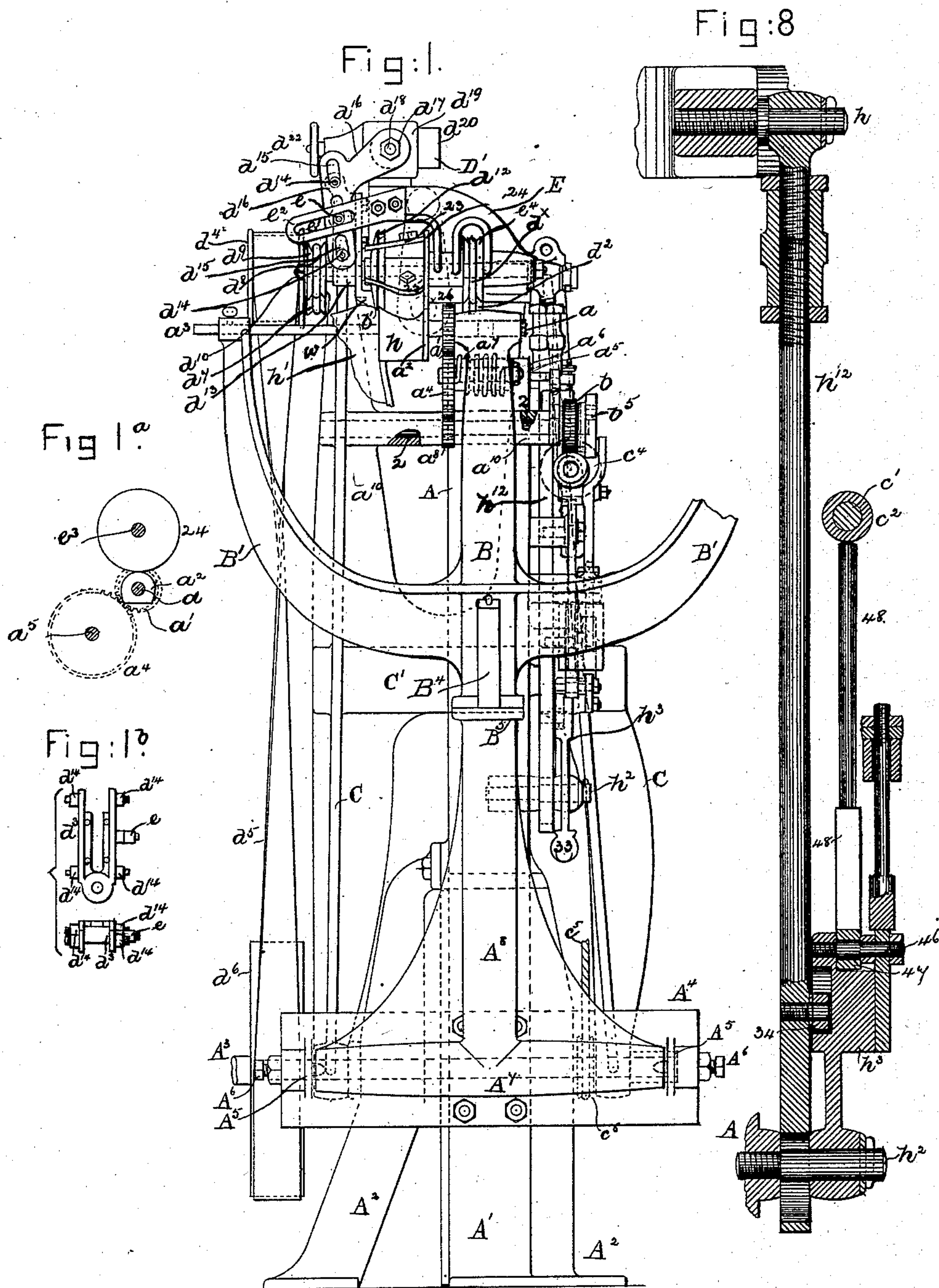
(No Model.)

3 Sheets—Sheet 1.

C. W. GLIDDEN.  
HEEL TRIMMING MACHINE.

No. 410,090.

Patented Aug. 27 1889.



Witnesses:

Edgar A. Goddard

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3 Sheets—Sheet 2.

No. 410,090.

Patented Aug. 27 1889.

Fig. 2.

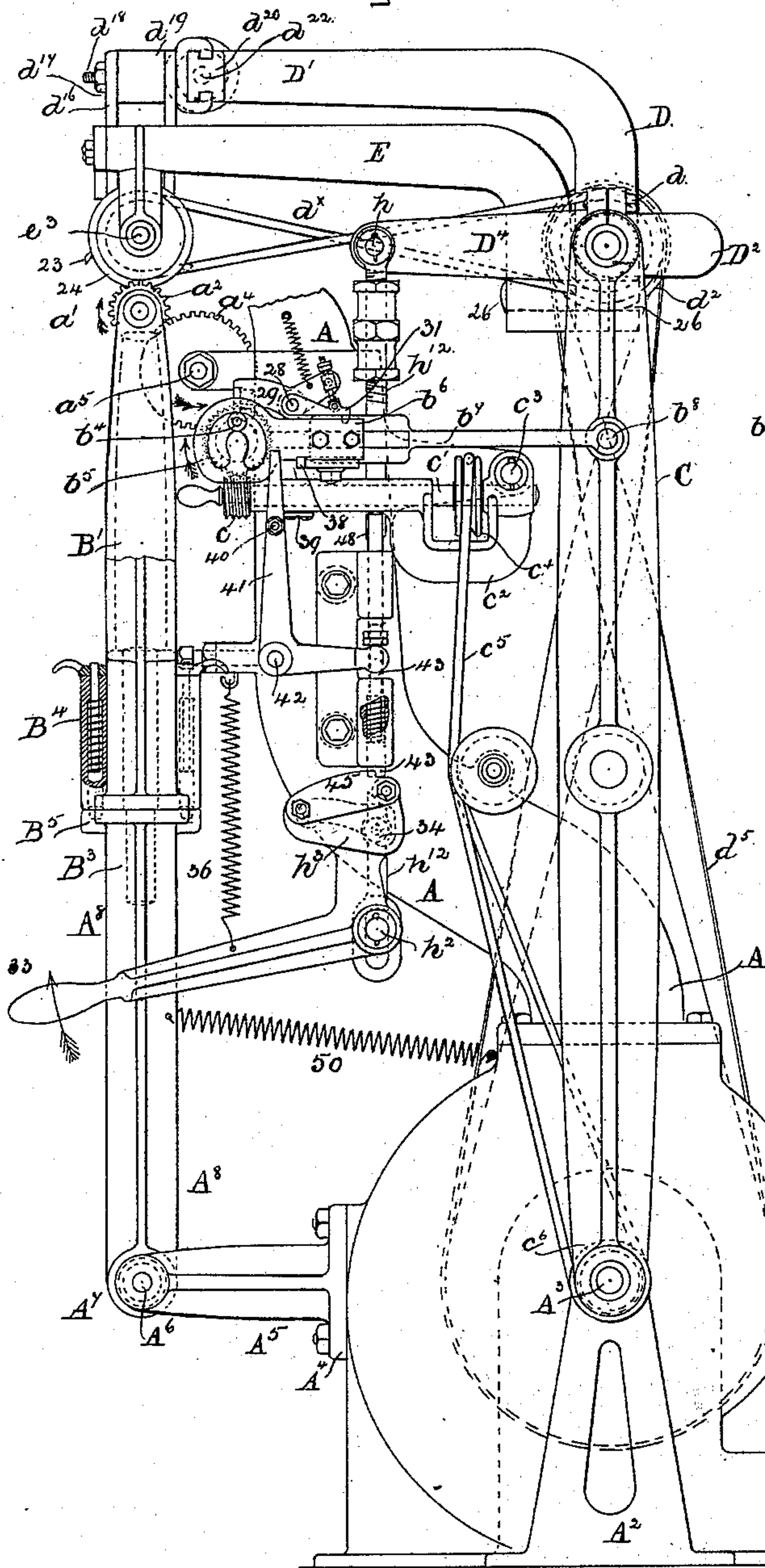


Fig: 3.

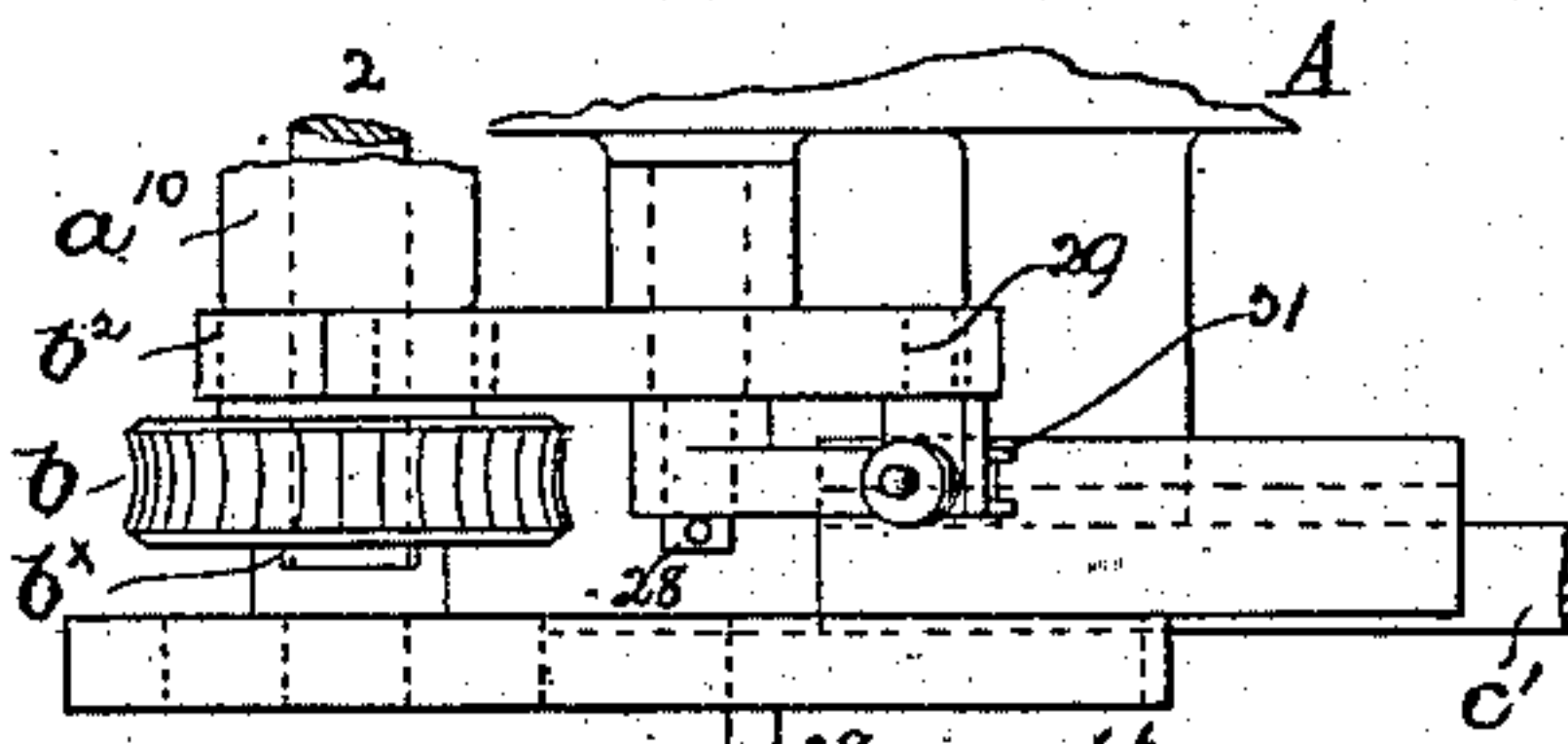


Fig: 4.

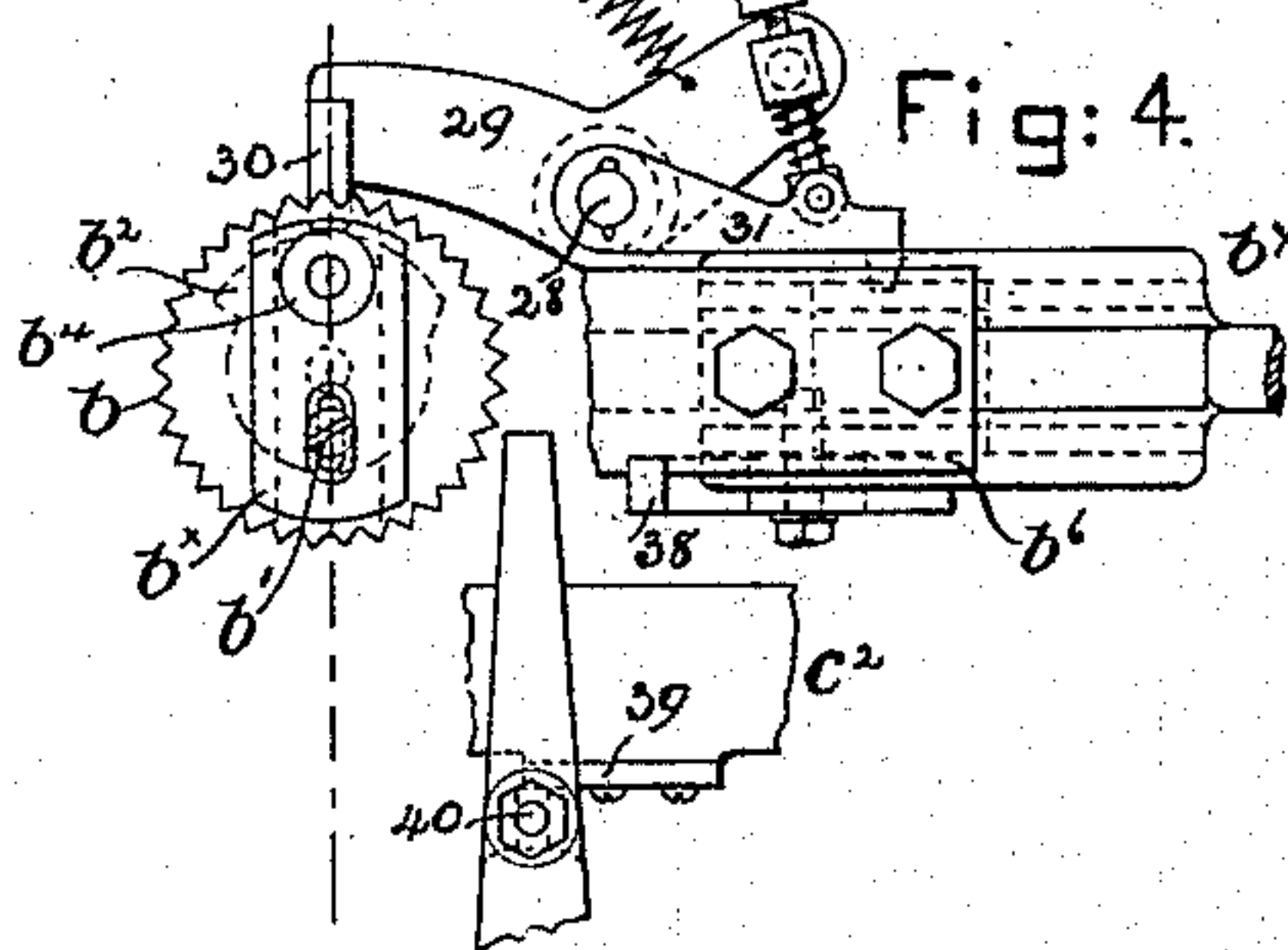


Fig: 5.

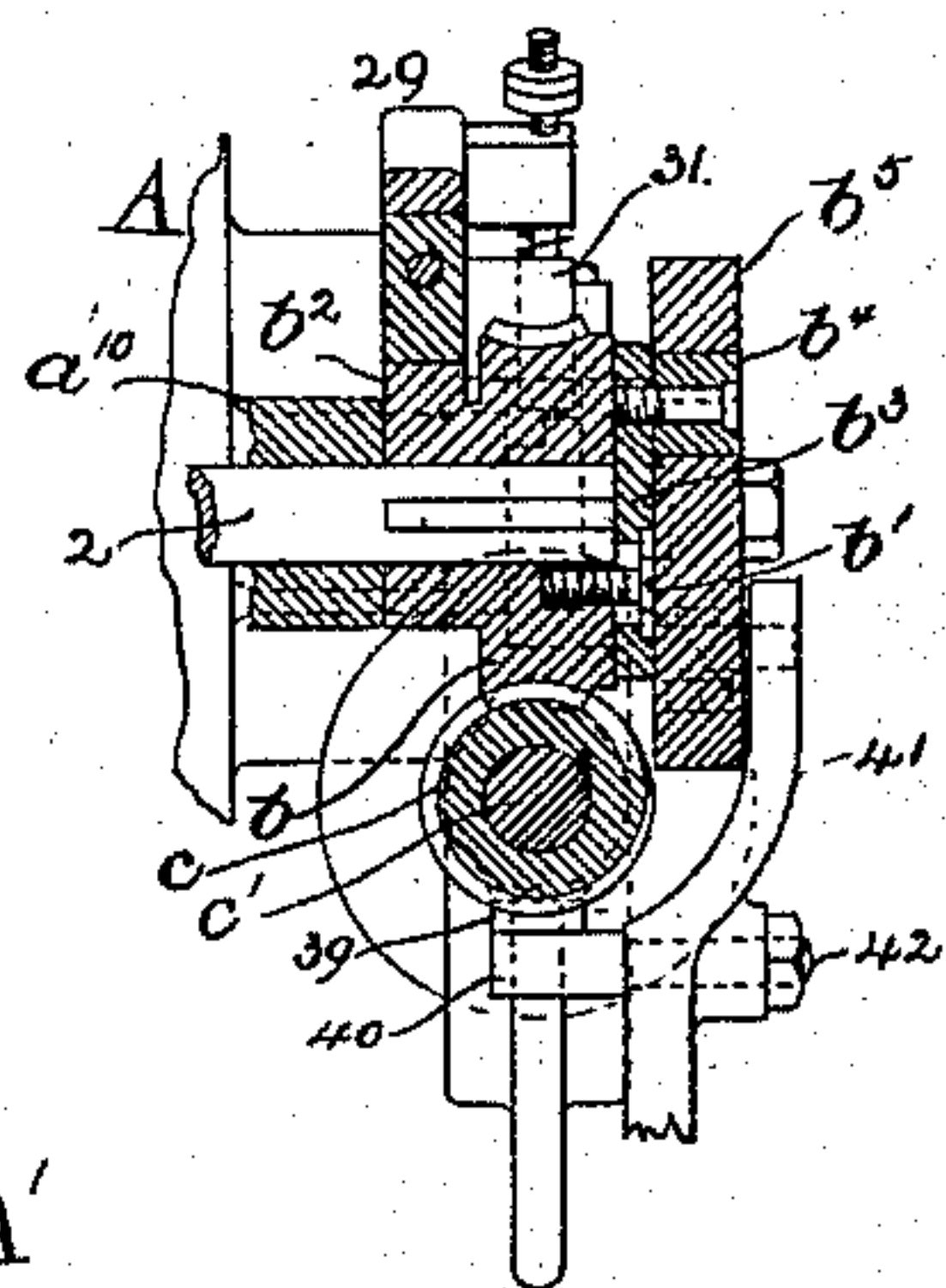


Fig: 6.

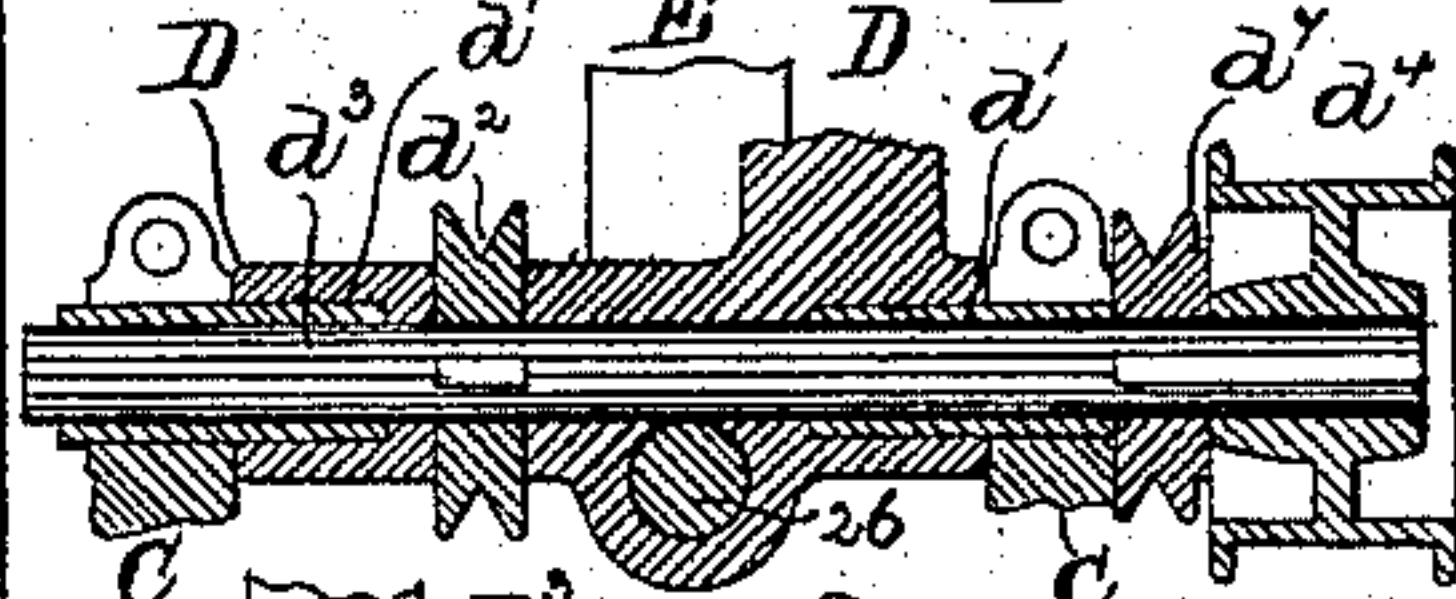


Fig:7.

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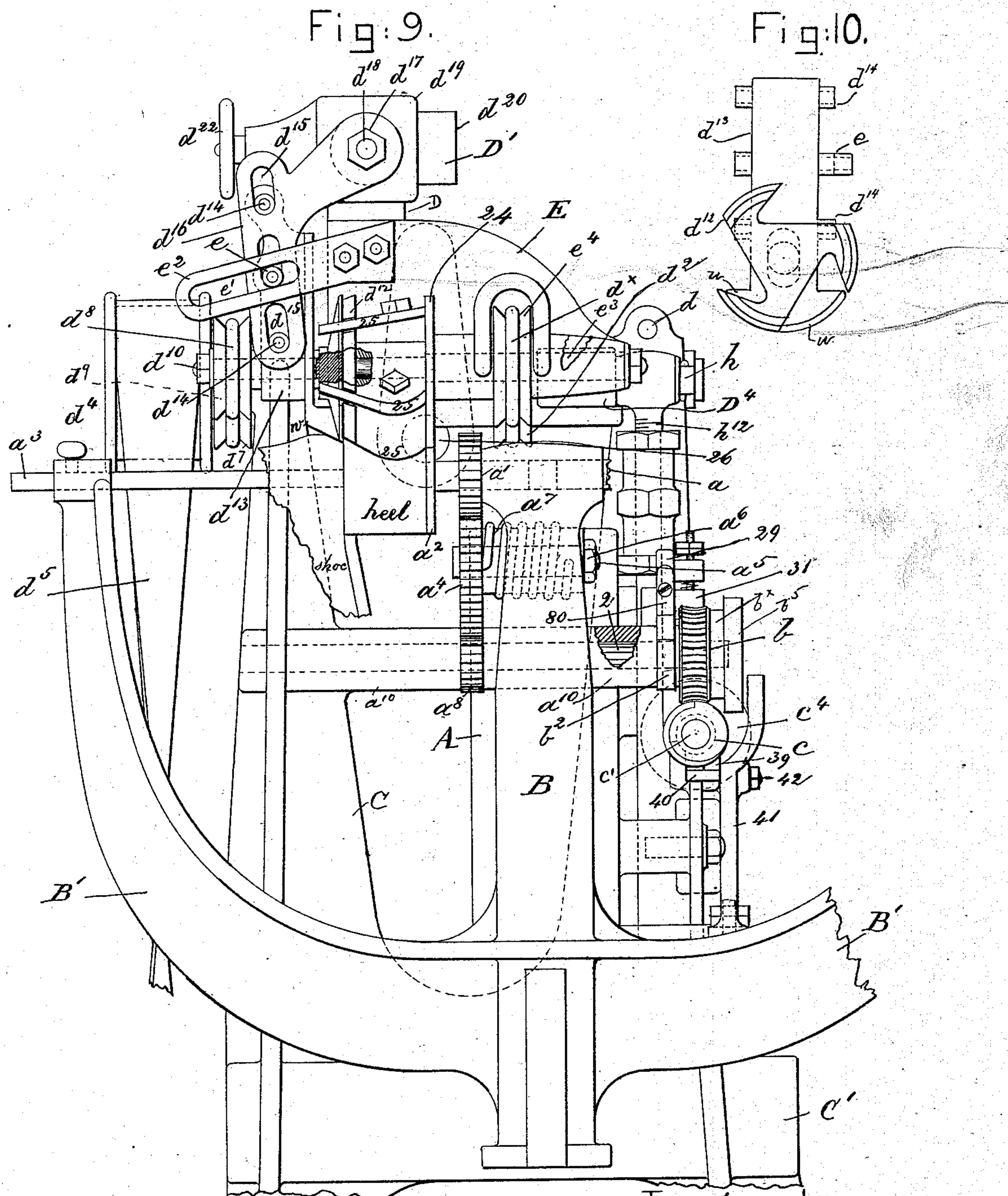
(No Model.)

3 Sheets—Sheet 3.

C. W. GLIDDEN.  
HEEL TRIMMING MACHINE.

No. 410,090.

Patented Aug. 27 1889.



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# UNITED STATES PATENT OFFICE.

CHARLES W. GLIDDEN, OF LYNN, ASSIGNOR TO JAMES W. BROOKS, TRUSTEE,  
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## HEEL-TRIMMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 410,090, dated August 27, 1889.

Application filed May 28, 1888. Renewed March 13, 1889. Serial No. 303,191. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES W. GLIDDEN, of Lynn, in the county of Essex and State of Massachusetts, have invented an Improve-  
5 ment in Heel-Trimming Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention has for its object the production of a novel heel-trimming mechanism.

In my invention herein contained the heel pattern-plate of the jack mechanism is rotated automatically to rotate the heel while  
15 being presented to and acted upon by the blades of a rotating molded cutter, and during the rotation of the heel pattern-plate and heel a pivoted frame carrying the rotating molded cutter is, through the action of a pattern-cam, moved to cause the said cutter when  
20 acting upon the sides of the heel to travel longitudinally in the direction of the length of the heel measured from its rear part to its breast and at right angles to the center of rotation of the heel pattern-plate. The pattern-  
25 cam referred to is of such shape that this longitudinal movement of the cutter with its frame is suspended, or substantially so, while the cutter is acting upon the rear part of the  
30 heel, it being understood that the heel is always in motion through the heel pattern-plate, to which it is clamped, while the cutter acts to trim the heel, the cutter when trimming and shaping the rear side of the heel  
35 having only a motion of rotation.

In this my improved machine the shaft carrying the heel pattern-plate rotates in fixed bearings of a jack, the said jack being preferably a twin or double jack, the head of the  
40 jack being free to rotate at proper times about the substantially-vertical axis of a jack-spindle, so that either half of the jack, with a shoe clamped therein, may be brought into trimming position under the rotating  
45 molded cutter. The spindle supporting the head of the jack is pivoted to swing out and in in the arc of a vertical circle, to thus enable it to be swung forward and backward away from the molded cutter to permit the  
50 rotation of the jack. The molded cutter re-

ferred to is attached to one end of a short cutter-shaft provided with a pattern-guide, the said shaft having its bearings in an irregular-shaped tipping frame mounted upon a rocking frame, so as to enable the cutter to  
55 rise and fall, the rocking frame in turn being pivoted on a swinging frame. The tipping frame is mounted on the said rocking frame to move or tip in a circular path about a center or axis of motion at right angles to the  
60 center of motion of the said rocking frame and of rotation of the shaft carrying the heel-trimming cutter, the axis or center of motion about which the said tipping frame moves to adapt the heel-trimming cutter to the vary-  
65 ing angle or inclination of the exterior of the heel always remaining in line with the contact-point between the usual pattern-guide and the usual heel pattern or plate at the tread end of the heel, this tipping frame be-  
70 ing an essential feature of my invention.

I have provided the machine herein to be described with an automatically-operating device by which to arrest the rotation of the heel pattern-plate on the completion of the  
75 trimming of a heel, said mechanism, as illustrated in the present embodiment of my invention, being arranged to first stop and thereafter reverse or turn the heel-pattern plate  
80 back into its starting position. As the trimming is completed, the arm carrying the cutter-shaft is automatically lifted, to thus avoid injury to the heel by the cutter, the lifting of the cutter also permitting the jack to be  
85 swung away from the cutter.

My invention in heel-trimming machines consists, essentially, in the combination of the following instrumentalities, viz: a jack, a partially-rotating heel pattern-plate, a rock-  
90 ing frame, means to support it, a rotating cutter-carrying shaft, a heel-trimming cutter, and a pattern-guide carried by the said shaft, combined with a tipping frame having bearings for the said shaft and means to support the said tipping frame on the said rocking  
95 frame, whereby the said tipping frame is free to move in a circular path about a center or axis of motion at right angles to the axis of rotation of the cutter-carrying shaft, the center or axis of motion about which the said  
100



tipping frame moves to adapt the heel-trimming cutter to the varying angle or inclination of the exterior of the heel always remaining in line with the contact-point between the usual pattern-guide and the usual heel pattern or plate at the tread end of the heel.

With the above I have combined a rand or counter guard and also a rotating rand-cutter.

My invention also consists in a jack to support the shoe the heel of which is to be trimmed, a rotating cutter, a shaft, a swing-frame, and means between the said swing-frame and shaft to support the latter, combined with a pattern-cam to move the swing-frame intermittently to cause the cutter to move horizontally in its rotation while the sides of the heel are being trimmed, as will be described; also, in the combination, with a tipping frame and a carriage having an attached rand or counter guard, of a connection between the said frame and carriage to operate the latter, as will be described; also, in a heel-trimming machine, a rotating cutter, its shaft, and frame to support the shaft, combined with a double or twin jack, the head of the jack rotating upon a vertical axis, while the foot of the jack is free to tip toward and from the cutter upon a horizontal axis.

Other features of my invention will be hereinafter described, and pointed out in the claims at the end of this specification.

Figure 1 is a front elevation, partially broken out, of a heel-trimming mechanism embodying my invention; Fig. 1<sup>a</sup>, a detail to be referred to, showing the heel pattern-plate and pattern-guide; Fig. 1<sup>b</sup>, different views of the carrier in which rotates the shaft of the rand-cutter; Fig. 2, a right-hand end elevation of Fig. 1, the upper part of the wind-trunk being broken off. Figs. 3, 4, and 5 are enlarged details showing some of the devices employed to move the swinging frame forward and backward; Fig. 6, a sectional detail of the upper end of the swinging frame, showing the shaft therein, which by suitable belts actuates both the rotary molded cutter and the rand-cutter, the said figure in section also showing the hub of the rocking frame which carries the pivot pin or stud, constituting a center of motion about which moves the tipping frame carrying the cutter-shaft. Fig. 7 is a partial plan view of the rear end of the rocking frame. Fig. 8 is an enlarged detail of devices joined to an arm of the rocking frame and of devices employed to stop and start the pattern-cam; and Fig. 9 is an enlarged front elevation of the upper part of the machine, the jack being partially broken away, together with some of the other parts of the machine. Fig. 10 is a front elevation showing the rand-trimming cutter and the carriage, together with the rand-trimming cutter and its shaft therein.

The wind-trunk A, rising from a blower case or shell A' and having secured to it

stands or feet A<sup>2</sup>, constitutes practically the main frame-work of the machine, the said stands or feet supporting bearings for the main shaft A<sup>3</sup>, (shown broken off at the left of Fig. 1,) the said shaft being driven in any usual manner.

A bracket A<sup>4</sup>, suitably bolted to or forming part of the blower-case, has ears A<sup>5</sup>, in which, as herein shown, are arranged pointed studs A<sup>6</sup>, which constitute pivot-bearings for the foot A<sup>7</sup> of a jack-spindle A<sup>8</sup>, the said jack-spindle having mounted upon it a jack B, herein shown as having oppositely-extending arms B', to thus form what is called a "twin jack," or a jack with double capacity, one arm of the jack being shown as broken off in Fig. 1, the part so broken off at the right being supposed to be the same as fully illustrated at the left in said figure. The jack referred to is free to be rotated upon a suitable vertical pin, as B<sup>3</sup>, (shown by dotted lines in Fig. 2,) and co-operating with the said jack and spindle are suitable locking devices, as B<sup>4</sup>, (see Fig. 2,) herein represented as spring-actuated bolts carried by the jack and adapted to enter holes in a flanged part B<sup>5</sup> of the spindle.

The central standard of the jack has at its upper end a bearing for the reception of two short shafts, as *a*, each provided with a gear as *a'*, each shaft having also attached to it a heel pattern-plate, as *a*<sup>2</sup>, (see Figs. 1 and 1<sup>a</sup>,) of the shape of the tread of the heel to be trimmed; the said heel being herein marked *h* and the shoe *h'*, a suitable clamping rod or spindle *a*<sup>3</sup> acting within the shoe in any usual manner to enable the thread of the heel to be forced snugly against the pattern-plate *a*<sup>2</sup>. The heel pattern-plate, mounted as described, has, it will be noticed, only a motion of rotation. The gear *a'* on the shaft *a*, when the jack is in position to have the cutter act and trim the heel, is engaged by an intermediate gear *a*<sup>4</sup> on a short stud *a*<sup>5</sup>, held in fixed position by a suitable nut *a*<sup>6</sup>, the said gear having connected to it one end of a spiral spring *a*<sup>7</sup>, (see Fig. 1,) while the opposite end of the said spring is fixed with relation to the frame-work, the said spring restoring the said intermediate gear *a*<sup>4</sup> to its normal position whenever the small gear *a'* of the jack is disengaged from it, as will be described. The stud *a*<sup>5</sup>, referred to, enters and is held in a bearing or ear forming a part of the wind-trunk A, or in any other fixed part of the frame. The intermediate gear *a*<sup>4</sup>, referred to, is engaged or rotated by a gear *a*<sup>8</sup>, fast on a shaft 2, (see Figs. 3 and 5,) having a bearing *a*<sup>10</sup>, fixed to the wind-trunk or other rigid part of the frame-work. The shaft 2, (see Figs. 3 and 5 on a larger scale,) has secured to it near its outer end a worm-gear *b*, the hub of which is shaped to form a cam *b*<sup>2</sup>, the front face of the said worm-gear having adjustably attached to it by a screw *b'* a slide-block *b*<sup>x</sup>, made adjustable diametrically across the face of the said worm-gear, the said slide-block



having a roller or other stud  $b^4$ , which enters a cam-shaped groove in the pattern-cam  $b^5$ , the said pattern-cam being herein shown as forming part of a plate  $b^6$ , (see Fig. 2,) bolted or otherwise secured rigidly to a link  $b^7$ , jointed at  $b^8$  by a suitable pin or connection to the swinging frame C, composed, essentially, of two upright arms connected by a pipe-like web or portion  $C'$ . The worm-gear  $b$  is engaged and rotated by a worm  $c$  on a short shaft  $c'$ , having its bearings in a bracket  $c^2$ , pivoted at  $c^3$  upon a rigid arm projected from the wind-trunk A or other part of the frame, the said shaft having upon it a belt-pulley  $c^4$ , which receives upon it a belt  $c^5$ , (see Fig. 2,) extended over a belt-pulley  $c^6$ , (see Fig. 1,) fast on the main shaft  $A^3$ .

The swinging frame C at its upper end has suitable bearings, preferably split and held together by grip-screws  $d$ , the said bearings receiving in them tubular bushings  $d'$ , (see Fig. 6,) on which turns the rocking frame D, it having an overhanging arm  $D'$  and an arm  $D^4$ , the frame having a suitable space  $D^3$  for the pulley  $d^2$  to drive the belt  $d^x$  for rotating the molded or heel-trimming cutter, as will be described, the said pulley being fast on a shaft  $d^3$ , having its bearings in the said bushings and provided with a belt-pulley, as  $d^4$ , which receives on it the belt  $d^5$ , driven by the belt-pulley  $d^6$ , fast on the main shaft  $A^3$ , the said shaft  $d^3$  also having fast on it a belt or cord pulley  $d^7$ , which on its rotation actuates a suitable belt  $d^8$ , (see Fig. 1,) which is extended over a pulley  $d^9$ , fast on the shaft  $d^{10}$ , carrying the rand-cutter  $d^{12}$ , the said shaft  $d^{10}$  having its bearings in a carriage  $d^{13}$ , having at its opposite side rolls or studs  $d^{14}$ , which enter guiding-slots  $d^{15}$  in a guide-plate  $d^{16}$ , having two parallel and like arms, the said guide-plate being adjustably attached by a set-nut  $d^{17}$  on a stud  $d^{18}$  of a block  $d^{19}$ , made adjustable horizontally on a guide portion  $d^{20}$  of the arm  $D'$ .

The rand-trimming cutter  $d^{12}$  will preferably form an integral part of the shaft  $d^{10}$ . In Fig. 9, where the rand-trimming cutter and one of the blades of the heel-trimming cutter and the usual head to which it is attached is broken out, it will be seen that the shaft  $e^3$ , to which the head of the heel-trimming cutter is attached, terminates substantially at the outer end of the said cutter. The blades 25 of the heel-trimming cutter extend into and through the slots or spaces in the rand-trimming cutter, thus preventing the formation of any fin, as described, at the heel-seat end of the heel, as will be understood. The shafts carrying the heel-trimming cutter and the rand-trimming cutter are actuated independently of each other, and are entirely disconnected one from the other, but for a considerable time during the trimming operation are substantially in line. The block  $d^{19}$  is made adjustable horizontally by a screw  $d^{22}$  to place the rand-cutter in proper position with relation to the molded cutter according to the thickness of the heel.

The carriage  $d^{13}$  has at each side a roller or other stud  $e$ , which enters a slot, as  $e'$ , on an arm  $e^2$ , securely bolted to the front end of a tipping frame E of irregular shape, (shown best in Figs. 1 and 2,) the said head having at its front end a yoke portion which contains bearings for the shaft  $e^3$  of the rotary molded cutter, the said cutter having blades 25 of a shape suitable to give to the heel the desired shape.

The cutter-shaft at the tread end of the molded cutter has loose upon it a pattern-guide, as 24, (see Fig. 2,) of usual construction, against which bears the heel pattern-plate  $a^2$ , before referred to, of the jack mechanism as the shaft  $a$  is rotated, as described.

The shaft  $e^3$  has on it a pulley  $e^4$ , which receives the belt  $d^x$ , before described.

The frame E, called the "tipping frame," is mounted to move in a circular path about an axis or center of motion represented by the pin or stud 26, held in the rocking frame D (see full lines, Fig. 6, and dotted lines, Fig. 1) and extended therefrom at right angles to the axis of motion of the said rocking frame, so that the axis or center of motion about which the said tipping frame tips to tip the shaft  $c^3$  and the molded cutter as the exterior of the heel is being trimmed is always kept directly in line with the contact-point of the heel pattern-plate with the pattern-guide, such location of the pin or stud 26 enabling the tread end of the blades of the molded cutter in all positions of the heel to trim the latter fully to the pattern-plate, and yet the blades will not touch the pattern-plate to be dulled. During the movement of the tipping frame E about its center or axis of motion the slotted arm or connection  $e^2$  acts on the carriage to move it nearly vertical, such movement of the carriage, it taking place as the shaft  $c^3$  of the cutter is tipped in the direction of its length, causing the lip of the rand or counter guard  $w$ , attached to the said carriage to uncover more or less of the edges of the blades 25 of the heel-trimming cutter, the lip of the rand or counter guard remaining, however, in the rand-crease and at the same relative distance from the cutting-edges of the blades of the molded cutter.

The drawings, Figs. 1 and 2, show the parts in the positions they will occupy when one-half of the heel has been trimmed. When the trimming commenced, the roller-stud  $b^4$  stood in the lower left-hand end of the slot in the pattern-cam  $b^5$ , and as the said roll  $b^4$  moved in the slot of the said pattern-cam from its end into the position Fig. 2 the cam was drawn bodily to the left, taking with it the swinging frame C and its attached parts, the molded cutter during such movement acting to trim the heel from the breast along the side of the heel, the said frame not, however, being moved laterally, as described, while the said pin was traveling in the upper and substantially circular part of the cam-slot of the pattern-plate, for at such time, and as shown



in Fig. 2, the rotary molded cutter is trimming the approximately-circular part of the heel. Starting from the position Fig. 2, the roller  $b^4$  so long as it travels over to the right in the substantially-circular part of the slot of the pattern-cam the latter will not be moved; but as soon as the approximately-circular part of the heel has been trimmed the said roll  $b^4$  passes from the substantially-circular portion of the slot in the pattern-cam and again begins to move the said pattern-cam and swinging frame to the left, during which time the molded cutter trims the second straight side of the heel. While the molded cutter is acting to trim the approximately-circular or rear part of the heel the pattern-cam is restrained from longitudinal movement by a locking device, to be described.

The wind-trunk or other rigid part of the frame has on it a stud 28, (see Figs. 2 and 4,) on which is pivoted a lever 29, having a toe 30, which rests on the cam  $b^2$ , before described, the said stud having also mounted on it a locking-pawl 31, having a toe to enter a notch in the link  $b^7$ , carrying the pattern-plate, the said pawl being kept in locking engagement with the said link so long as the toe 30 of the lever 29 rests on the high point of the cam  $b^2$ , as in Fig. 4, this being the condition while the approximately-circular part of the heel is being trimmed; but when the toe 30 rests against the portions of the cam  $b^2$  of least radius, then the locking-pawl is released to enable the slide to be moved freely.

In another application, Serial No. 275,363, filed by me on the 28th day of May, 1888, I have shown a jack which is moved longitudinally under the cutter while the straight side of the heel is being trimmed; but herein it will be seen that the jack while the straight side of the heel is being trimmed remains stationary, and the cutter-shaft and molded cutter are moved longitudinally to cause the cutter, in addition to its rotation, to travel bodily along the sides of the heel. The cutter having trimmed the heel to the breast and the movement of the heel having been stopped, the cutter must be removed quickly from contact with the heel. To do this, the arm  $D^4$  of the rocking frame D has jointed to it by a pin  $h$  an adjustable or two-part link or connecting-rod  $h^{12}$ , the lower end of which is slotted and fits loosely a guiding-stud  $h^2$ , projecting from the wind-trunk or other rigid part of the frame. The stud  $h^2$  receives on it a lifting-cam  $h^3$ , having a hand-piece 33, the shape of the acting portion of the groove of the said cam being best shown by dotted lines in Fig. 2, the said groove receiving in it a roller or other stud 34, attached to the link  $h^{12}$ , so that when the said cam  $h^3$  is turned in direction of the arrow shown in Fig. 2 the said link will be lifted to lift the rocker-frame. This movement of the cam  $h^3$  to raise the rocking frame is effected automatically by a spring 36, attached to a suitable stud on the wind-trunk

A or frame, but not, however, until after the said cam  $h^3$  has been released.

The shank of the pattern-plate has extended from it a pin or projection 38, and the bracket  $c^2$  has also a pin or projection 39, which rests on a lug 40 of a lever 41, pivoted at 42. The lug 40 in the position Figs. 2, 4, and 5 holds up the bracket  $c^2$ , so that the worm  $c$  engages the worm-gear  $b$ ; but as the pattern-cam reaches the extremity of its throw to the left the projection 38 meets the lever 41 and moves the lug 40 from under the projection 39, which permits the bracket  $c^2$  to turn and free the worm from driving engagement with the worm-gear  $b$ . At the same time the lever 41 by its short arm engages a collar or projection on a spring-pin 43, removing the end of the said spring-pin from engagement with a locking-plate 45, attached to the cam  $h^3$ , and permits the spring 36 to operate. The worm  $c$  having been released, the operator takes in his hand the jack  $B'$  and pulls the same laterally against the spring 50, in order to place the spindle in such position that the jack may be rotated. In moving the jack outwardly the gear  $a'$  is removed from engagement with the gear  $a^4$ , and the spring  $a^5$ , before described, then acts to turn the said gear and the worm and crank-pin  $b^4$  back into their normal position, the said crank-pin during such operation traveling in the pattern-plate and pushing the swing-frame C fully to the right. The cam  $h^3$  is also provided with a stud 46, having a roll 47, (see Fig. 8,) which, after a new shoe has been applied to the jack and the handle 33 depressed to turn the cam  $h^3$  and permit the rocking frame to fully descend to enable the cutter to trim the heel, strikes the lower end of a slide-rod 48 and lifts it, thus lifting the bracket  $c^2$  and placing the worm  $c$  in engagement with the worm-gear  $b$  to commence the rotation of the heel.

In practice the upper end of the wind-trunk will have an inlet arranged close to the molded cutter to carry away the chips, dust, &c.

Many heel-trimming machines employ a rand or counter guard without a separate rand-cutter, and, if desired, the rand-cutter may be omitted; but for the best results and the more perfect trimming of the heel to avoid any possible fin next the counter or heel portion of the upper I prefer to employ a rand-cutter.

I claim—

1. In a heel-trimming machine, the following instrumentalities, viz: a jack, a partially-rotating heel pattern-plate, a rocking frame, means to support it, a rotating cutter-carrying shaft, a heel-trimming cutter, and a pattern-guide carried by the said shaft, combined with a tipping frame having bearings for the said shaft and means to support the said tipping frame on the said rocking frame, whereby the said tipping frame is free to move in a circular path about a center or axis of motion at right angles to the axis of motion of



the rocking frame, the center or axis of motion about which the said tipping frame moves to adapt the heel-trimming cutter to the varying angle or inclination of the exterior of the heel always remaining in line with the contact-point between the usual pattern-guide and the usual heel pattern or plate at the tread end of the heel, substantially as described.

2. In a heel-trimming machine, a jack to hold the shoe the heel of which is to be trimmed, a partially-rotating heel pattern-plate, a rocking frame, means to support it, a rotating cutter-carrying shaft, a heel-trimming cutter, a pattern-guide carried by the said shaft, and a tipping frame having bearings for the said shaft, and means to support the said tipping frame on the said rocking frame, whereby the said tipping frame is free to move in a circular path about a center or axis of motion at right angles to the axis of motion of the rocking frame and at right angles to the center or axis of motion to the cutter-shaft, combined with a carriage having a rand or counter guard, substantially as described.

3. In a heel-trimming machine, a jack to hold the shoe the heel of which is to be trimmed, a partially-rotating heel pattern-plate, a rocking frame, means to support it, a rotating cutter-carrying shaft, a heel-trimming cutter, a pattern-guide carried by the said shaft, and a tipping frame having bearings for the said shaft, and means to support the said tipping frame on the said rocking frame, whereby the said tipping frame is free to move in a circular path about a center or axis of motion at right angles to the axis of motion of the rocking frame and at right angles to the center or axis of motion to the cutter-shaft, combined with a carriage having a rand or counter guard and a rotating rand-cutter, to operate substantially as described.

4. In a heel-trimming machine, a jack to support the shoe the heel of which is to be trimmed, a rotating heel-trimming cutter, its shaft, and frame to support it, a swing-frame pivoted to swing at right angles to the axis of rotation to the cutter-shaft, and means between and connecting the said swing-frame, and means for supporting the said rotating shaft, combined with a pattern-cam to move the said swing-frame intermittently to cause the heel-trimming cutter to be moved horizontally during its rotation to trim the sides of the heel, substantially as described.

5. In a heel-trimming machine, a jack, a heel pattern-plate, means to partially rotate it, a cutter-shaft, its attached heel-trimming cutter, means to support the said shaft, the swing-frame, and rocking frame, combined with a pattern-cam, connections between it and the swing-frame, and a locking device to hold the pattern-cam in position while the approximately-circular portion of the heel is being trimmed, substantially as described.

6. In a heel-trimming machine, the rotating cutter, its shaft, and a tipping frame in which the said shaft has its bearings, (the axis or center of movement of the said frame being substantially at right angles to the axis of rotation of the shaft carrying the said cutter,) combined with the rand or counter guard and a carriage to which it is attached, and with connections between the said tipping frame and the said carriage, whereby the tipping frame in its movements simultaneously moves the said carriage and the rand or counter guard to uncover more or less of the cutting-edges of the blades of the said rotating cutter, substantially as described.

7. In a heel-trimming machine, the heel-trimming cutter, its shaft, the tipping frame, in which the said shaft has its bearings, and means to support the said tipping frame, whereby it may move in a circular path about an axis or a center substantially at right angles to the shaft carrying the said cutter, combined with a carriage, an attached rand or counter guard, a rotating shaft mounted in the said carriage, a rand-cutter connected to the said shaft, and with connections between the said tipping frame and the said carriage, whereby the tipping frame in its movements simultaneously moves the said carriage and its attached parts, enabling the counter-guard to uncover more or less of the cutting-edges of the blades of the rotating heel-trimming cutter, substantially as described.

8. In a heel-trimming machine, the tipping frame, the rotating heel-trimming cutter, its shaft supported in the said tipping frame, the rocking frame upon which the tipping frame is mounted to move about an axis or center at right angles to that about which the rocking frame moves, and the guide portion  $d^{20}$ , connected to the said rocking frame, combined with a block and guide-plates, as  $d^{16}$ , adjustably connected thereto, a carriage mounted in the said guide-plates, a rand or counter guard attached to the said carriage, and connections between said tipping frame and carriage, to operate substantially as described.

9. In a heel-trimming machine, a rotating cutter, a swing-frame C, and the pattern-cam in operative connection therewith, combined with a roll or stud  $b^4$  entering the groove in the said cam, and with means to actuate the said roll, substantially as described.

10. In a heel-trimming machine, a trimming-cutter, the swing-frame C, and the pattern-cam in operative connection therewith, combined with a roll or stud  $b^4$  entering the groove in the said cam, and with means to actuate the said roll and the cam  $b^2$  and locking device, to operate substantially as described.

11. In a heel-trimming machine, a rotating cutter, the worm-gear having the roll  $b^4$ , the pattern-cam entered by the said roll, the projection 38, the bracket  $c^2$ , the shaft  $c'$  therein, and its worm c, to engage and rotate the worm-



gear, combined with the lever to support the said bracket until the said lever is tripped, to thus automatically release the worm from the worm-gear, substantially as described.

5 12. In a heel-trimming machine, a rotating shaft, a heel-trimming cutter thereon, a rocking frame, and means to support the said shaft to rise and fall in unison with the said rocking frame, combined with a link and a cam  
10 to actuate the same to turn the said rocking frame and remove the cutter from contact with the heel being trimmed, substantially as described.

13. In a heel-trimming machine, a trimming-cutter, the rocking frame, its attached  
15 link, and a cam to move the said link and turn the said frame about its center of motion, combined with the holding-plate, as 45, a locking-pin, and a locking device, and means  
20 to release the said locking device and to move the said cam automatically, substantially as described.

14. In a heel-trimming machine having a rotating heel-trimming cutter, a pivoted  
25 double or twin jack, a pattern-plate against which to hold the tread of the heel being trimmed, and gears  $a'$ , combined with a gear, as  $a^4$ , and means to rotate it, the movement  
30 of the said jack in one direction effecting the disengagement of the gear  $a'$  from the gear  $a^4$  and in the opposite direction effecting the engagement of the said gears, substantially as described.

15. In a heel-trimming machine, a rotating  
35 heel-trimming cutter and a tipping frame, combined with a carriage and its attached rand or counter guard, and with the connection between the said frame and carriage, to operate it substantially as described.

40 16. In a heel-trimming machine, a rotating heel-trimming cutter and a tipping frame, combined with a carriage and its attached  
45 rand or counter guard, and with the connection between the said frame and carriage to operate it, and with a rotating rand-cutter supported by the said carriage, substantially as described.

17. In a heel-trimming machine, a rotating  
50 cutter, its shaft, and a frame to support the shaft, combined with a double or twin jack,

the head of the jack rotating upon a vertical axis, while the foot of the jack is free to tip toward and from the cutter upon a horizontal axis, substantially as described.

18. In a heel-trimming machine, a jack, a  
55 heel pattern-plate carried thereby, its shaft, and attached gear  $a'$ , combined with an independent gear  $a^4$ , mounted upon a stud fixed to the frame, the said gear, when the jack is put into trimming position, being engaged by  
60 a gear  $a'$  on the shaft of the heel pattern-plate, thus rotating the latter, the two gears being disengaged when the jack is swung out of trimming position, substantially as described. 65

19. In a heel-trimming machine, a rotating  
cutter, the swing-frame C, and its hollow  
bushings  $d'$ , combined with the rocking frame  
D and the rotating shaft  $d^3$ , to operate sub-  
stantially as described. 70

20. In a heel-trimming machine, the combination, with a rotary cutter, pattern-cam,  
and gearing for operating it, of means, substantially as described, for engaging the said  
75 gearing automatically as the molded cutter is placed in position to start the trimming of a heel, substantially as described.

21. In a heel-trimming machine, a swing-  
frame to impart horizontal movement to the  
cutter-carrying shaft while the same is being  
80 rotated to trim the side of the heel, a jack, a heel pattern-plate, its shaft mounted in the said jack, a gear on the said shaft, and an intermediate gear, as  $a^4$ , to rotate the shaft carrying the said heel pattern-plate when the  
85 jack is in trimming position, combined with means intermediate the said gear  $a^4$  and the swing-frame to restore the latter to its normal position when the jack is moved to disengage the gear of the shaft of the heel pattern-plate  
90 from the said gear  $a^4$ , substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES W. GLIDDEN.

Witnesses:

GEO. W. HAMMATT,  
H. P. FAIRFIELD.