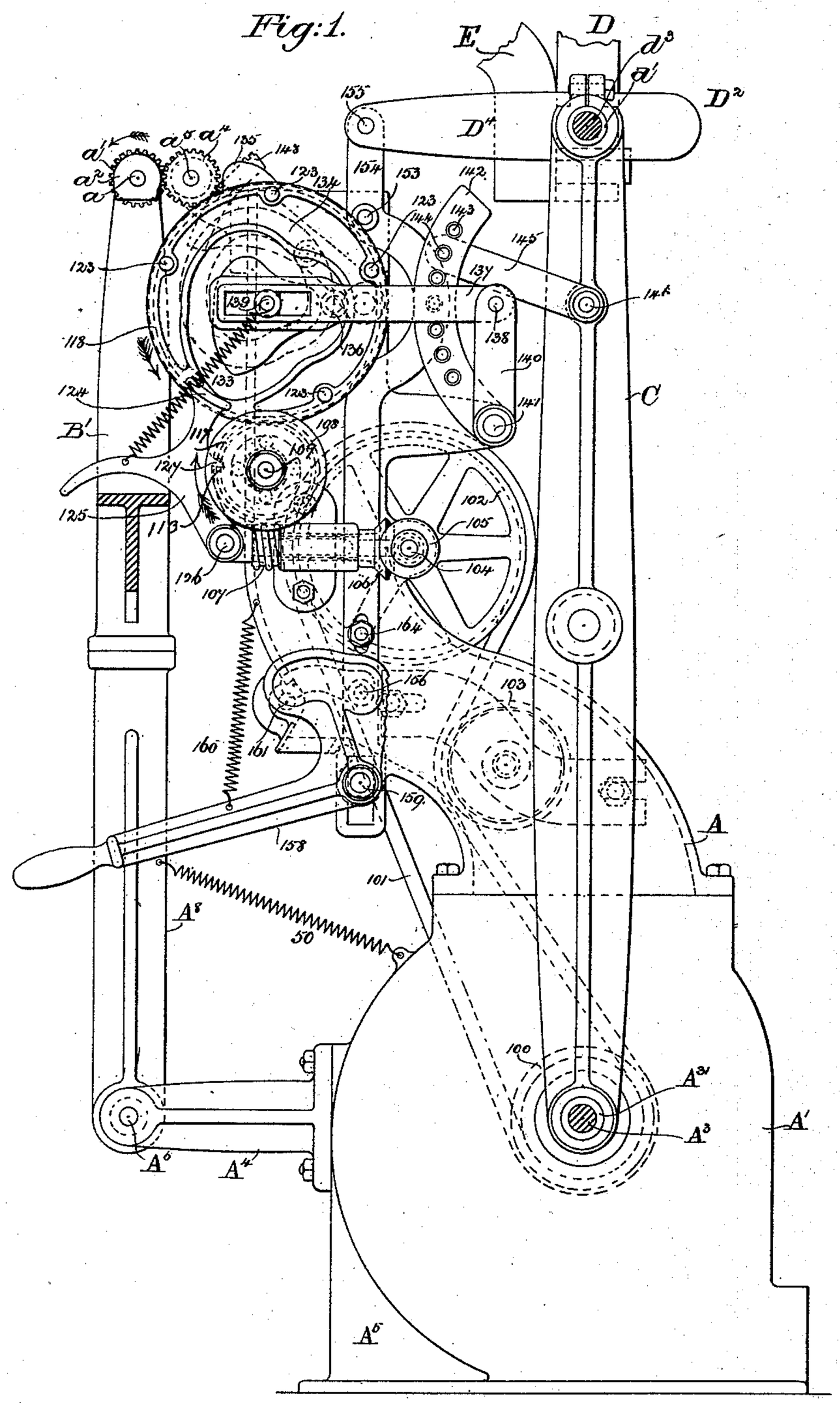
(No Model.) 3 Sheets—Sheet 1.

C. W. GLIDDEN.

HEEL TRIMMING MACHINE.

No. 410,087. Patented Aug. 27 1889

Fig: 1.



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Attys

(No Model.)

3 Sheets—Sheet 2.

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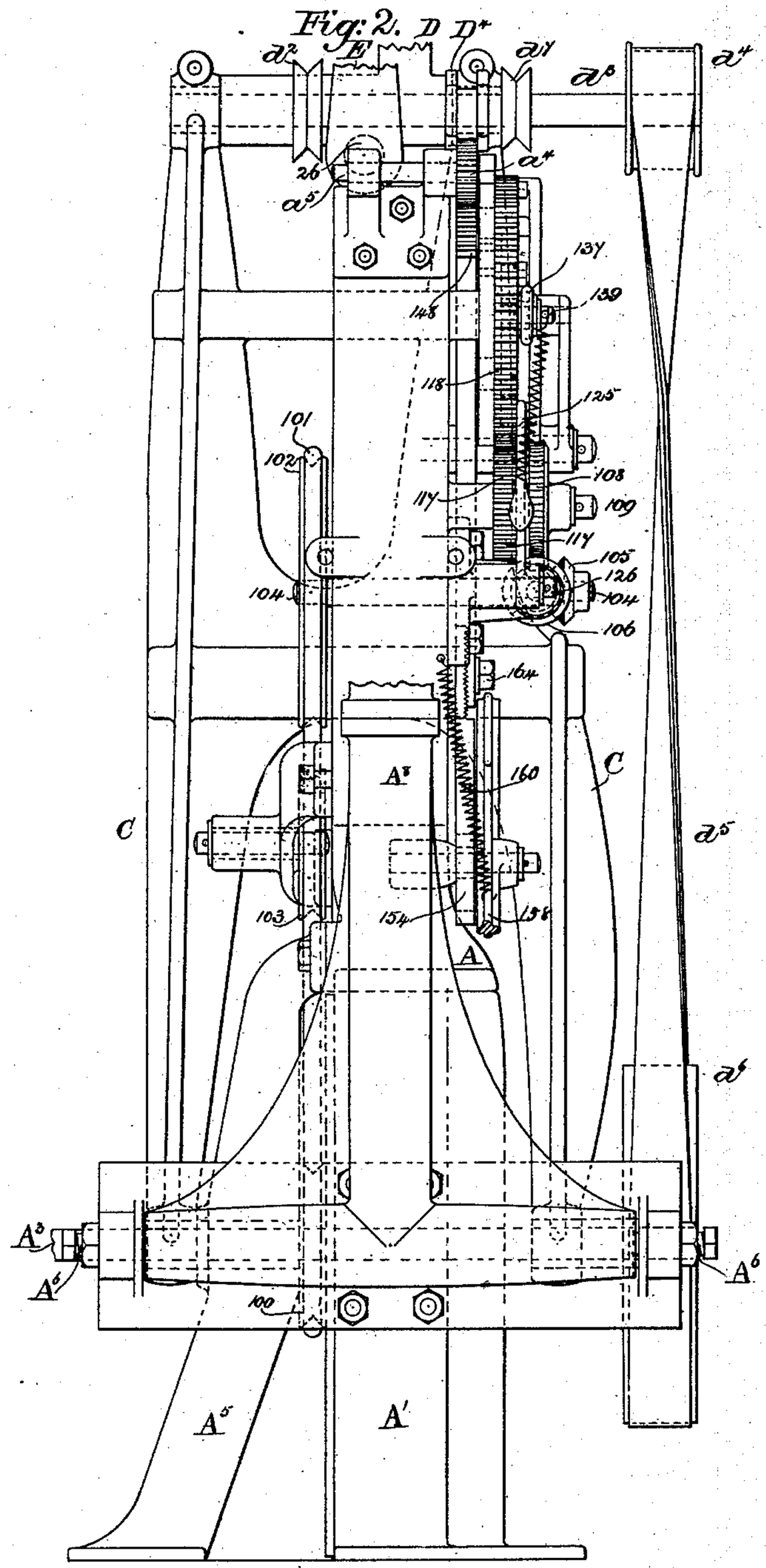
Fig: 2.



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(No Model.) 3 Sheets—Sheet 3.

C. W. GLIDDEN.

HEEL TRIMMING MACHINE.

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Fig: 4.

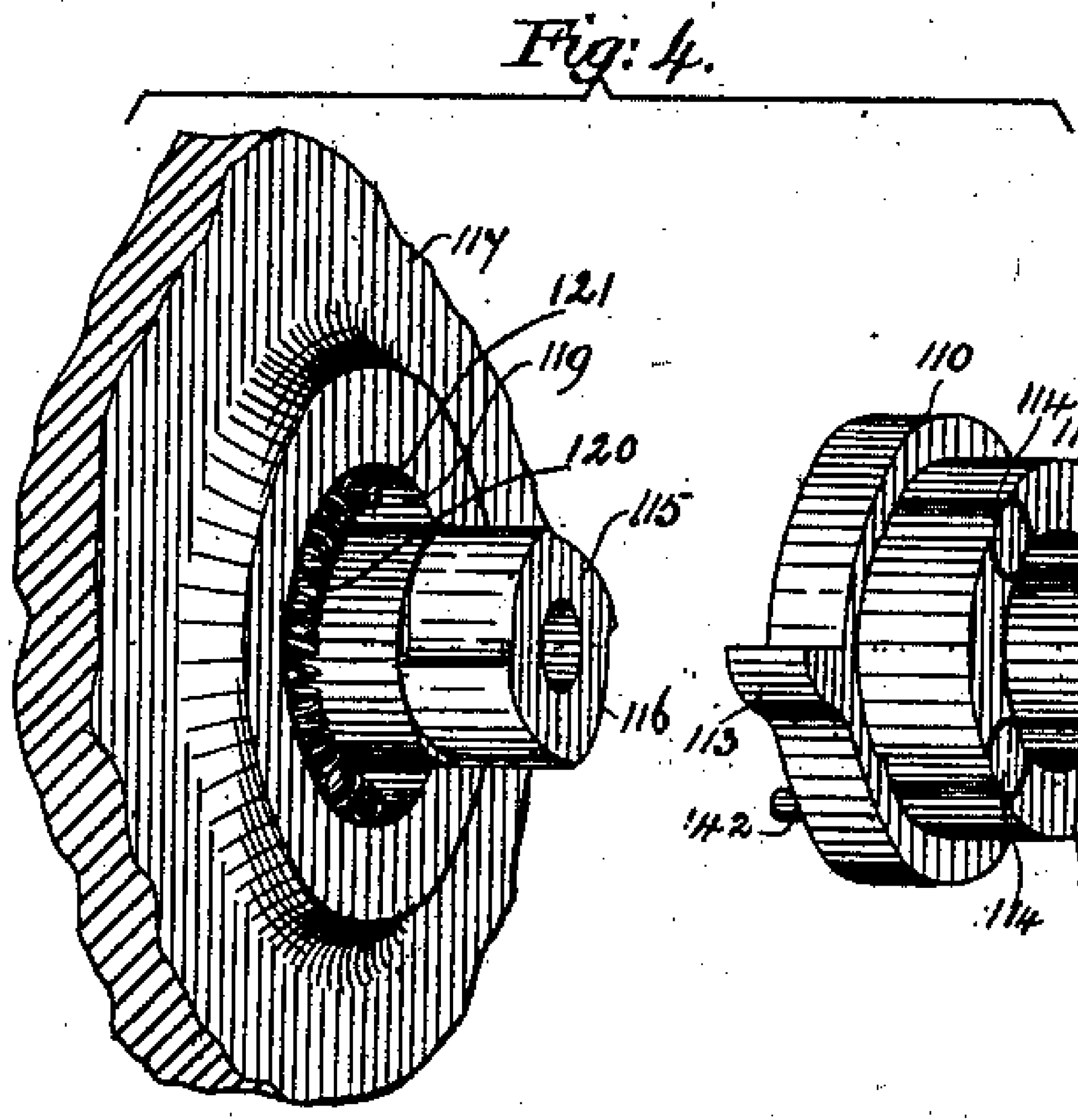
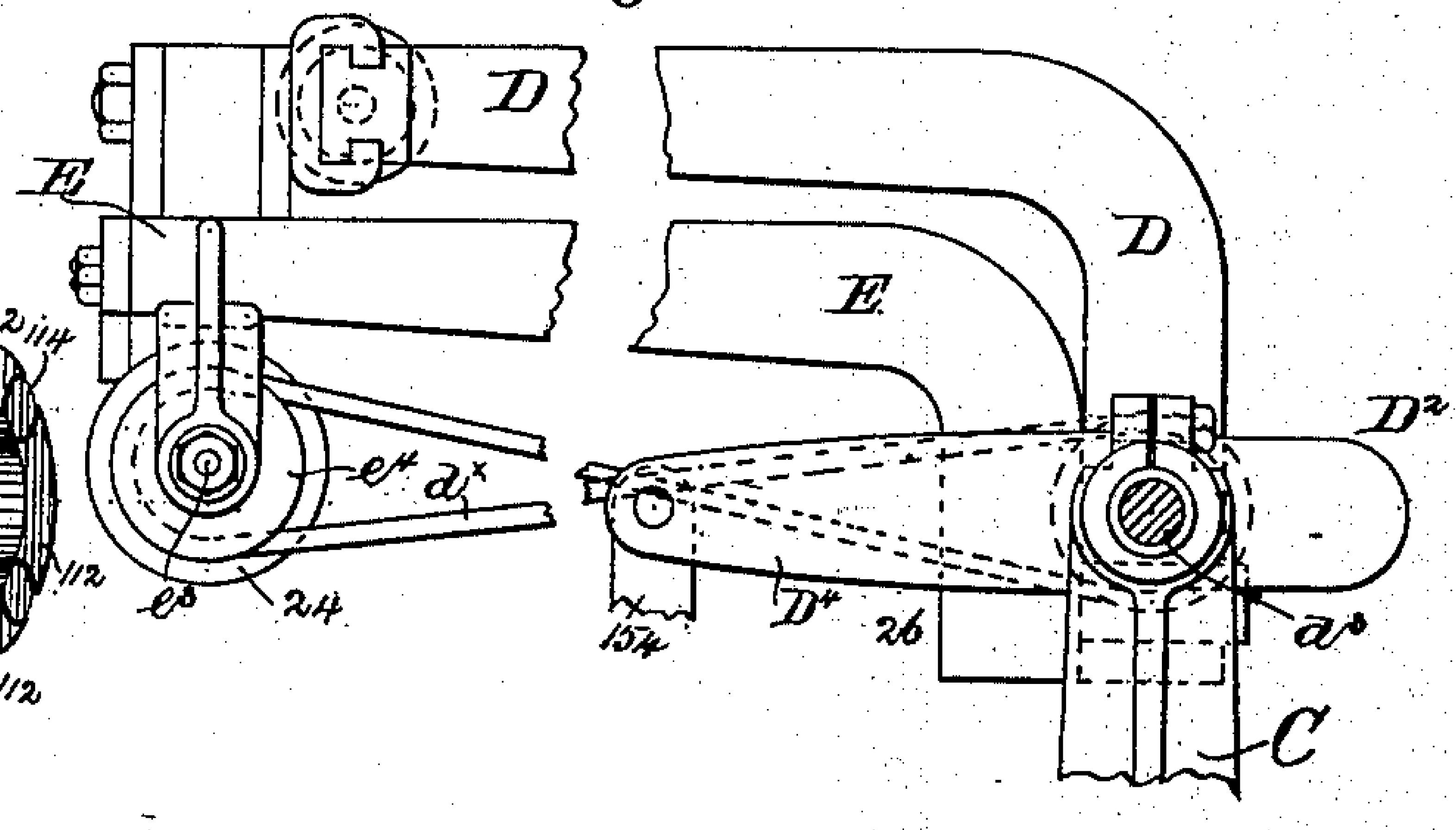


Fig: 3.



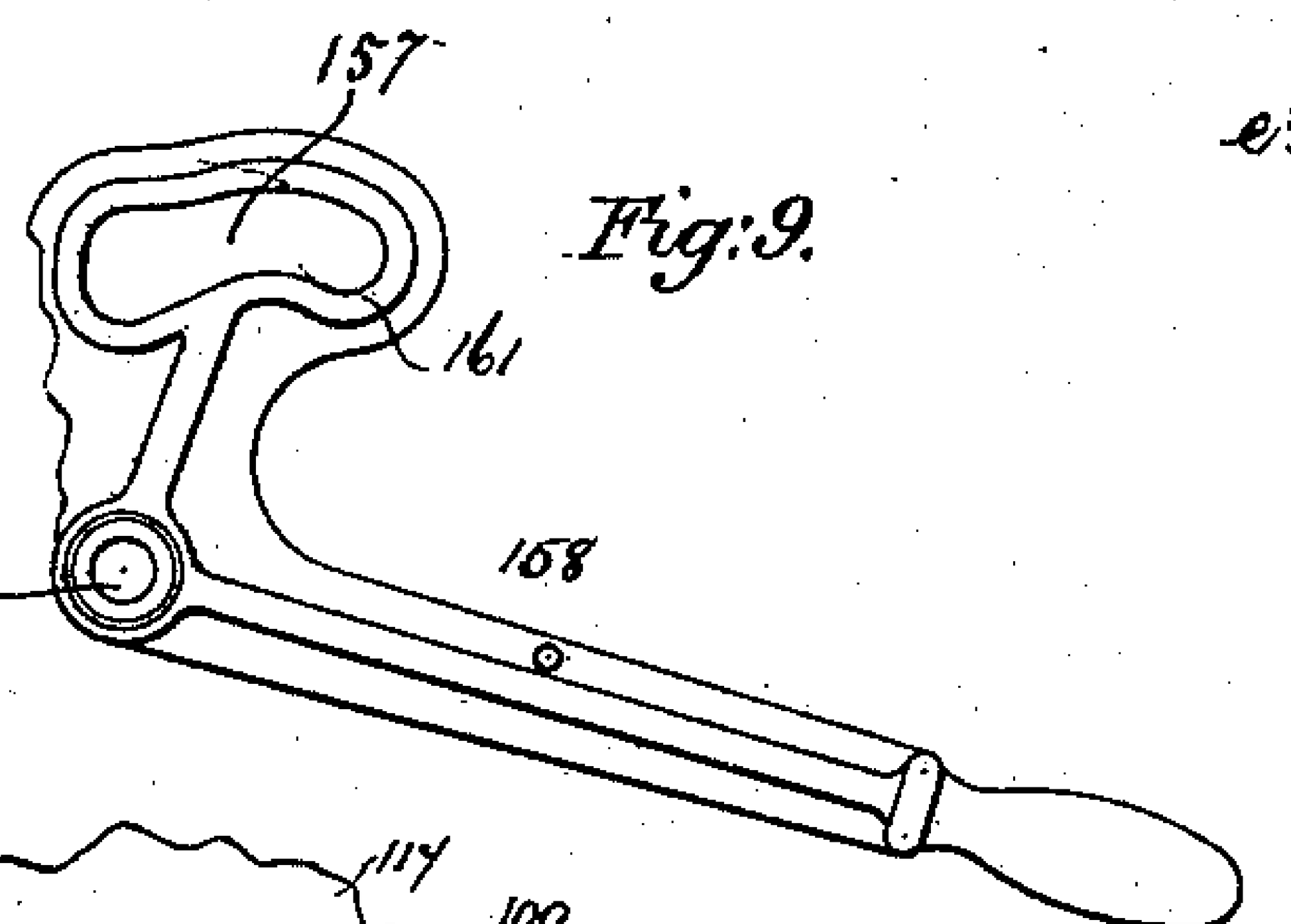


Fig: 9.

Fig: 8.

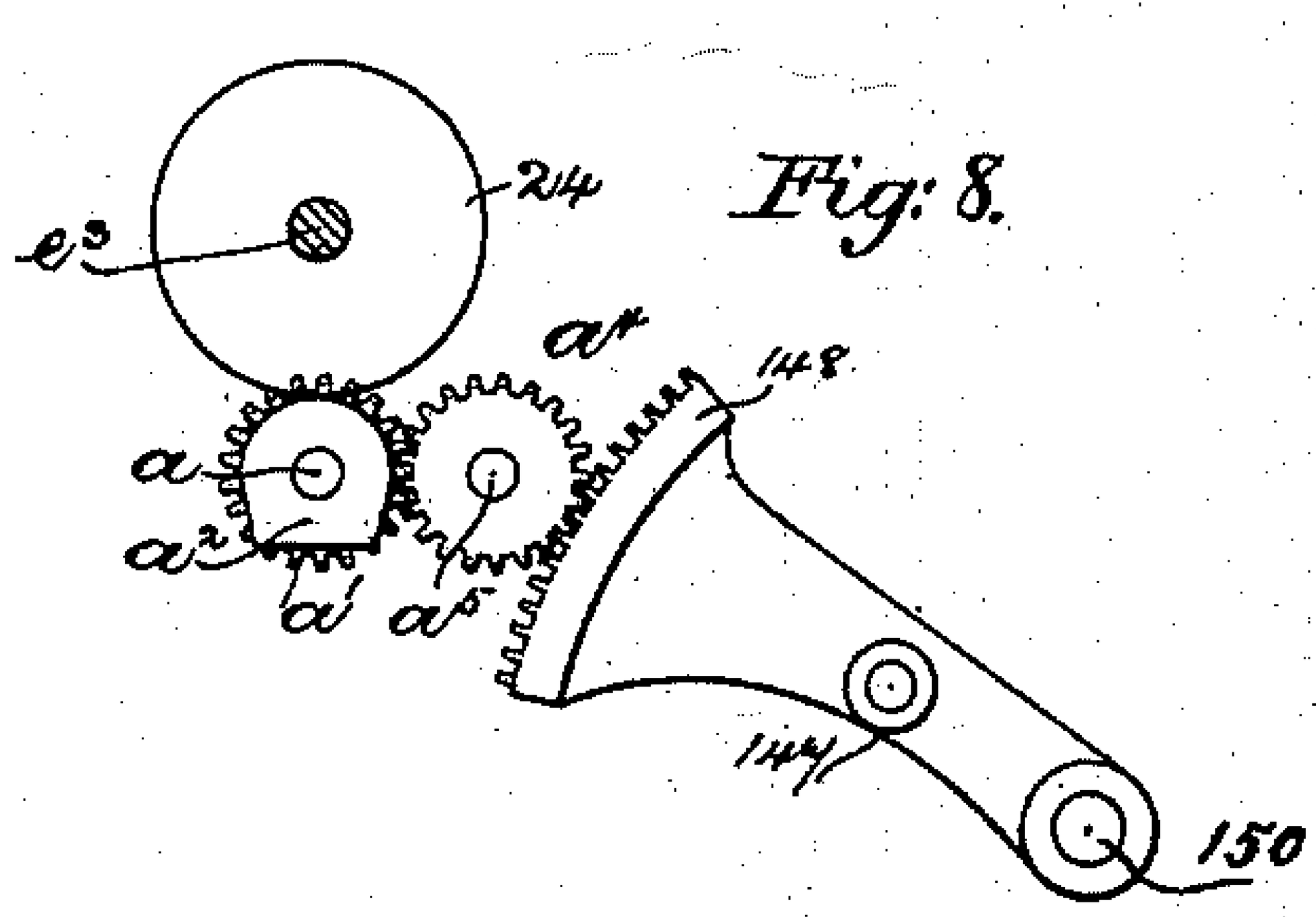


Fig: 5.

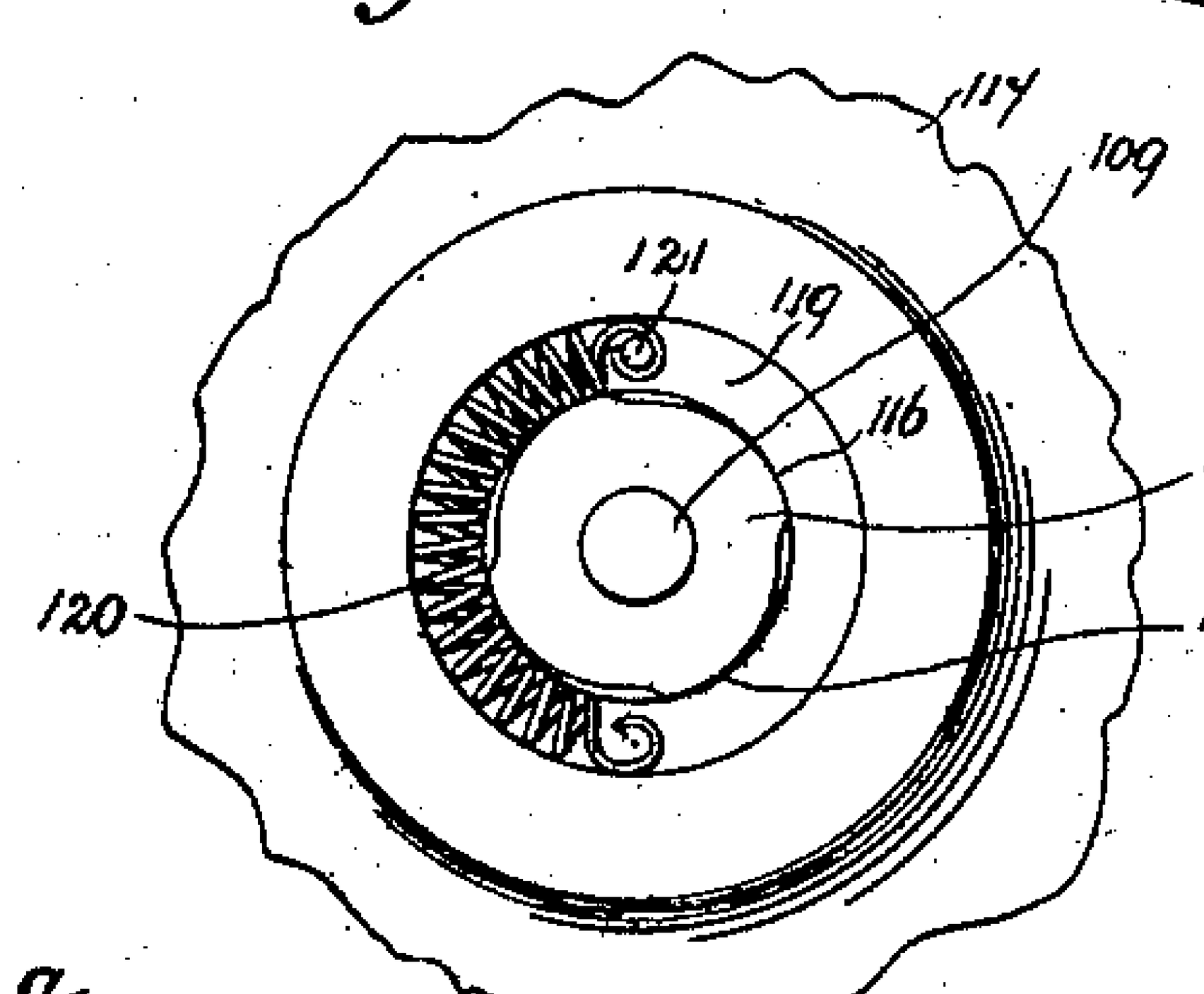


Fig: 7.

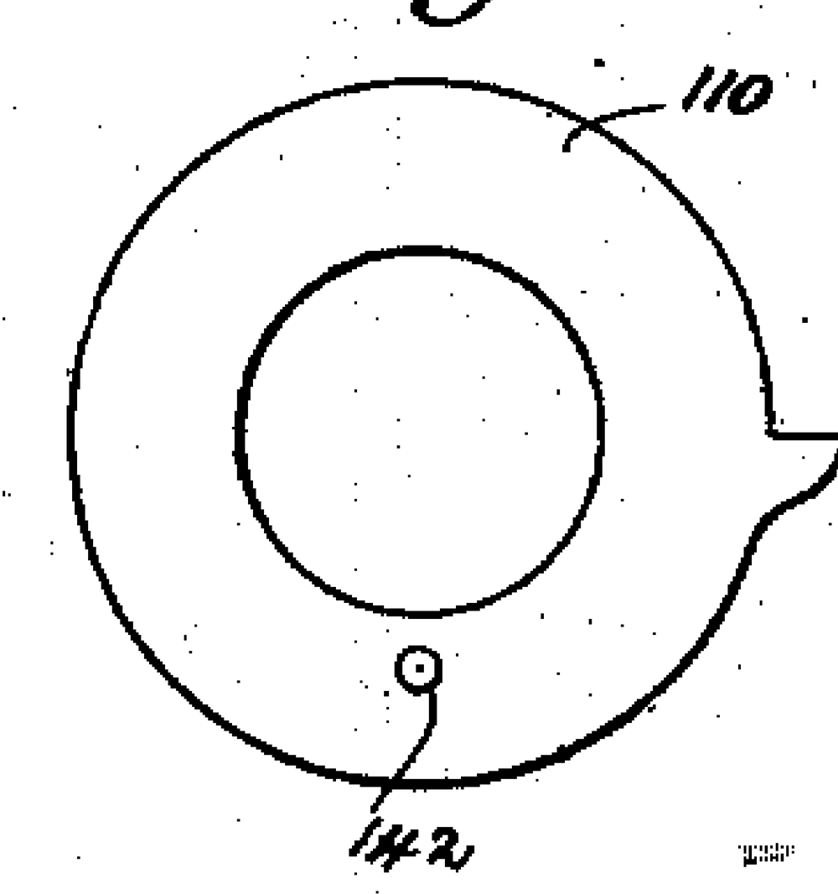
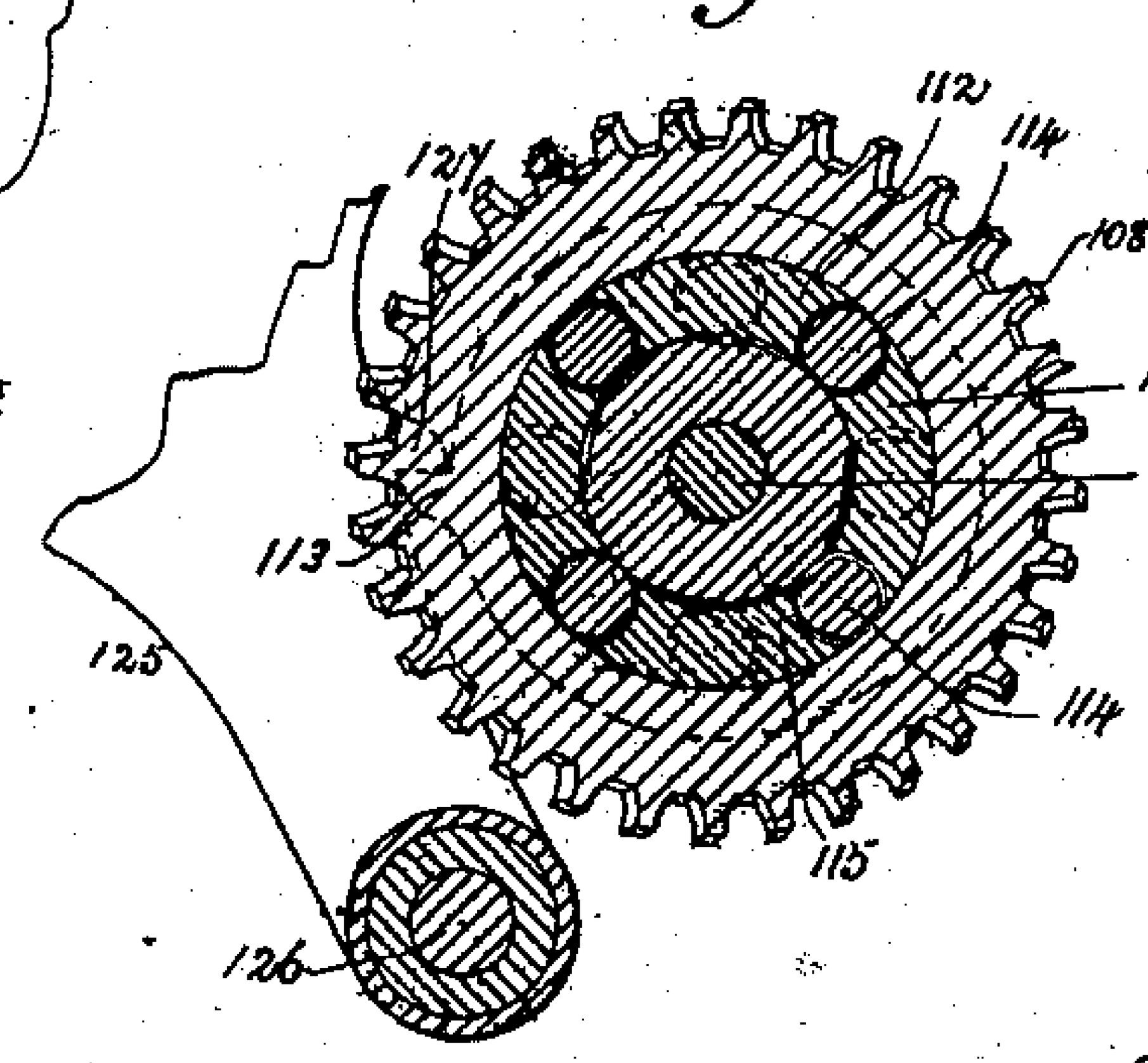


Fig: 6.



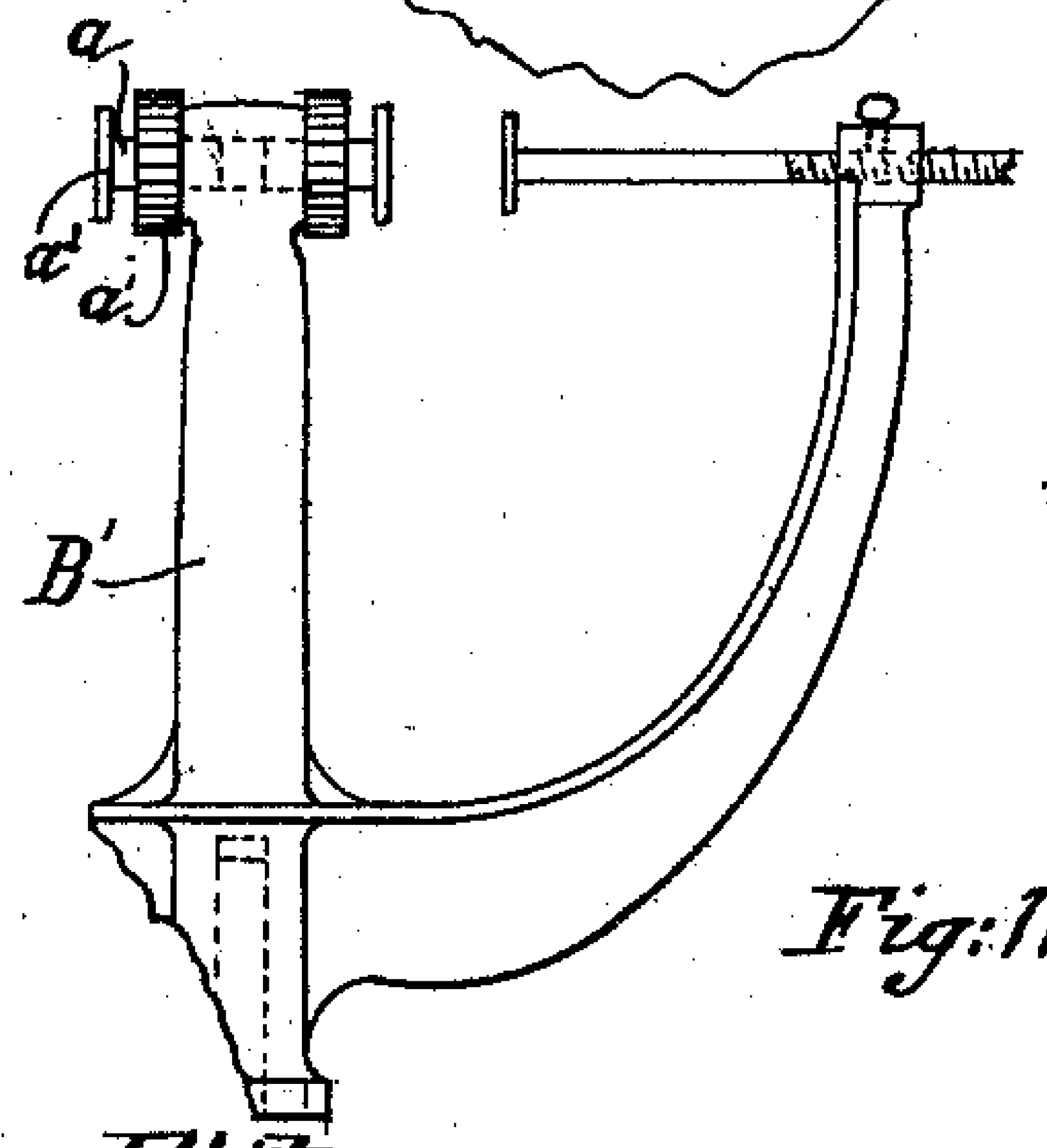
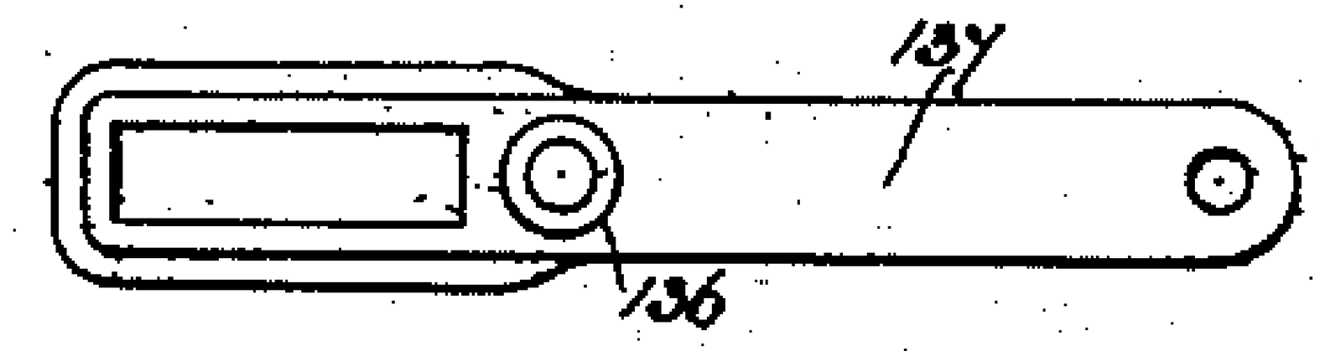


Fig: 11.

Fig: 10.



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UNITED STATES PATENT OFFICE.

CHARLES W. GLIDDEN, OF LYNN, ASSIGNOR TO JAMES W. BROOKS, TRUSTEE, OF CAMBRIDGE, MASSACHUSETTS.

HEEL-TRIMMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 410,087, dated August 27, 1889.

Application filed February 26, 1889. Serial No. 301,236. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. GLIDDEN, of Lynn, county of Essex, State of Massachusetts, have invented an Improvement 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.

This invention is an improvement on that contained in United States application, Serial No. 275,365, filed May 25, 1888; and it has for its object chiefly to simplify the mechanism employed for automatically moving the swing-frame carrying the cutter-shaft. In the application referred to the so-called "pattern-cam," employed to control the direction and extent of movement of the swing-frame, was made as a slotted plate secured to one end of a link jointed to the swing-frame, a partially-rotating gear having a crank-pin entering the said slot, and in its movement actuating the said link and swing-frame. The crank-pin referred to had to be turned back after the completion of each heel by a special mechanism therein fully set forth. In this my present invention the pattern-cam employed to actuate the swing-frame is made as a wheel which is rotated about a center, the said cam-wheel making one rotation during the trimming of each heel, and being stopped in position ready to be again started in rotation when the next heel is to be trimmed. So, also, in the machine described in the said application the means for giving to the swing-frame its vibrations could not be readily changed to give to the swing-frame different throws or length of stock to accommodate different-sized heels. Herein the swing-frame has intermediate it and the cam-wheel a connecting mechanism, (shown as a link,) and to provide for giving the swing-frame a greater or less throw, according to the size of the heel, I have herein represented the said connecting mechanism as composed of adjustable parts. I have also provided means for partially rotating the heel-pattern plate in one and then in an opposite direction.

The special features in which my invention consists will be described in the following specification, and pointed out in the claims at the end thereof.

Figure 1, in side elevation and partial section, represents a sufficient portion of a heeling-machine to enable my invention to be understood, the upper part of the jack being in section, the rocking frame and tipping frame being but partially shown, the shafts A^3 and d^3 being in section close to the frame-work, thus omitting the pulleys thereon. Fig. 2 is a partial left-hand side elevation of the parts shown in Fig. 1, the upper part of the jack being, however, broken off, the said figure showing the pulleys omitted from Fig. 1. Fig. 3 is a partial view of the devices carried by the swing frame, the rocking frame and tipping frame being broken out to save space on the drawings. Fig. 4 is an enlarged detail of part of the gear 117, and the clutch-ring and its rolls removed from the hub of the said gear. Fig. 5 is a detail of the hub of the gear 117. Fig. 6 is a vertical sectional detail taken through the loose worm-gear and the parts about which it turns continuously. Fig. 7 is a rear side elevation of the clutch-ring; Fig. 8, a detail showing the toothed sector, parts actuated by it, and the pattern-guide and its shaft. Fig. 9 shows the lowering-lever detached; Fig. 10, a detail of the link 137, and Fig. 11 is a detail of the upper part of the jack with one of its outer arms partially broken off.

The base A^5 of the frame-work is shown as shaped to form a blower-case A′, and bolted to it is a hollow frame A, to constitute not only a wind-trunk for the blower, but also bearings for the different working parts to be described. The base has bolted to it a stand A^4, on which is pivoted by screws A^6 the lower end or foot A^8 of the jack, it having a loosely-mounted swiveling top B′, which in practice will preferably be made of double or twin form, as described in the said application, so that the operator may be taking out or putting in a boot or shoe from one part of the jack while the cutter is acting to trim the heel of a shoe held in the other part of the said jack.

The base of the frame or the blower-case has bearings for a main shaft A^3, which in practice carries any usual form of exhaust-fan and suitable pulleys, as in said application, by which to rotate the shaft d^3, employed to drive the cutter-shaft e^3, the sleeve-like ends of the bearings A^{31} for the shaft A^3 serving as the pivots for the swing-frame C, provided at its upper end with bearings for the

said shaft d^3, the sleeve-like ends of the bearings d' for the said shaft d^3 serving as pivots for the rocking frame D, having an arm D^4, the said frame carrying at its outer end the guide for the carriage having the attached rand-guard and rand-cutter. The rocking frame receives a pin or stud 26, which forms a pivot for the tipping frame E, which at its forward end has bearings for the cutter-shaft carrying the usual rotary cutter for trimming the heel. The shaft A^3 has a pulley d^6, which, by belt d^5 on a pulley d^4 of shaft d^3, rotates it. The shaft d^3 has two pulleys d^2 and d^7. The pulley d^7, by belt $d^\times$ on pulley e^4 of the cutter-shaft e^3, (see Fig. 3,) rotates the latter, it having any usual cutter and also having fast on it the pattern-guide 24. The pulley d^2, by a suitable belt, (not shown,) rotates the shaft carrying the rand-cutter, (not shown,) but as in said application.

The parts so far described are common to the said application, and are therein designated by like letters, so need not be herein further specifically described. The shaft A^3 has on it a belt-pulley 100 (shown by dotted lines,) which receives a belt 101, extended over a pulley 102, fast on a shaft 104. The belt 101 is acted upon by a binder 103. The shaft 104 is provided at its opposite end with a bevel-gear 105, which engages a bevel-gear 106 on a shaft, shown by dotted lines, (see Fig. 1,) having fast to it a worm 107, which engages and rotates a worm-gear 108, loose on a stud 109, extended from the trunk A, the said gear and the parts surrounding it being shown in section, Fig. 6. The inner side of the worm-gear is chambered to receive a clutch-ring 110, having fingers 112 and a projection 113, the said fingers having between them a series of rolls 114. (See Figs. 4 and 6.) The clutch-ring 110 referred to surrounds a cam-hub 115, having a series of inclines 116, (see Figs. 4 and 5,) on which the rolls 114 rest. The hub 115 forms part of a gear 117, loose on the said stud and engaging the teeth of a cam-wheel 118, the resistance of the cam-wheel being sufficient to normally keep the gear 117 stationary on its stud 107. The gear 117 has at its side next the worm-gear 108 an annular groove 119, (see Figs. 4 and 5,) in which is placed a spring 120, one end of the said spring being attached to a pin 121, while the free end of the said spring is made in practice to act against a pin 142, extended from the rear side of the clutch-ring 110, (see Figs. 4 and 7,) the said spring 120 normally acting to turn the clutch-ring in such direction on the cam-hub 115 as to cause the rolls 114 to ride up the inclines 116 thereon and lock together the worm-wheel and the said hub so that the gear 117 will rotate the cam-wheel 118; but the rotation of the gear 117 may be and is stopped automatically once for each complete rotation of the cam-wheel 118, the said cam-wheel having a series of pins 123, which in its rotation strike in succession the end 124 of a clutch-controller 125, pivoted at 126, and having a projection 127, (shown by dotted lines, Figs. 6 and 1,) which, if not removed from the path of the projection 113 of the clutch-ring 110, will stop it, so that the rolls 114 are drawn down the said inclines toward the stud 109 by the spring 120 and made to release the worm-gear 108 from the said hub 115 and leave the gear 117 at rest.

In Fig. 1 it will be supposed that the gear 117 is at rest, as that part of the cam-wheel next the end 124 of the clutch-controller normally held up, as in Fig. 1, by a spring 133, but partially shown, is devoid of a pin, as 123, and consequently the projection 127 of the said clutch-controller is permitted to stand in the path of movement of the projection 113 of the clutch-ring as the said ring approaches the said projection. At all other times the pin 123 acts to turn the clutch-controller aside and place its projection 127 temporarily out of the path of the projection 113.

To start the wheel 117, it is only necessary for the operator to grasp the clutch-controller 125 by its handle and turn it to remove its projection 127 from the projection 113 of the clutch-ring. The said ring and the hub surrounded by it form a clutch, and while I prefer the form of clutch shown I desire it to be understood that I may use instead any other usual form of clutch mechanism capable of permitting the worm-gear 108 to be rotated continuously and make it drive the gear 117 at any desired time.

The cam-wheel 118, as shown, is constructed to perform three operations—that is, it has two cam-grooves, one 133, (shown by full lines, Fig. 1,) the other groove 134 (shown by dotted lines) being at the opposite side of the said cam-wheel, the wheel having at its periphery a cam projection 135. The cam-groove 133 receives in it a roll 136, (shown by dotted lines, Fig. 1, and separately in Fig. 10,) extended from a link 137, moved by the said cam and employed to actuate the swing-frame, the said link being herein shown as jointed at 138 to an arm 140 of a rock-shaft 141, the said shaft having a second arm 142, provided, as shown, with holes 143 to receive a pin 144, which serves to join to the said arm a link 145, which link is pivoted at 146 to the swing-frame C, adjustment of the link giving to the swing-frame more or less movement, according to the size of the heel. I desire it to be understood, however, that the said link 137, forming a connecting device, might be jointed at one end directly to the swing-frame. The link 137 is slotted, as shown, to embrace a stud 139, fixed to the frame A and serving as the center of motion of the cam-wheel 118. The cam 133 is of such shape as to hold the swing-frame at rest while the usual rotating cutter, carried by the shaft e^3 in the tipping frame E, is acting to trim the substantially-circular or rear part of the heel, and to move the said swing-frame about its pivots A^{31} while the said cutter is acting to trim the substan-

tially-straight sides of the heel between its rear part and breast, as described in the said application.

The cam 134 receives a roller or other stud 147 (shown by dotted lines, Fig. 1, see also Fig. 8) of a toothed sector 148, pivoted on a stud 150, extended from the frame A, the said sector engaging the pinion a^4 on the fixed stud a^5, both common to my said application, the said pinion engaging a pinion a^2, fast on the shaft a', mounted in bearings at the upper end of the central arm of the jack, (see Fig. 1,) the said central arm (shown in Fig. 11) having two such shafts arranged in line, each shaft having at one end between the said central arm and the outside arm of the jack a heel-pattern plate a^2, against which the tread end of the heel is forced and held in usual manner while being trimmed. The projection 135, at the proper time in the rotation of the cam-wheel 118—that is, just as the rotating cutter, (not shown,) it having finished the trimming of the heel, arrives at the breast of the heel—acts against a cam-roll 153 on a slide-bar 154, jointed at 155 to the arm D^4 of the rocking frame D. As the projection 135 in its rotation meets the roll 153, it lifts the bar 154, causing a second roller or other stud 156 (shown by dotted lines, Fig. 1, as standing in the slot 157 of the lowering-lever 158, pivoted at 159) to relieve the said lever from the holding action of the said stud and permit the spring 160 to turn the said lever 158 until the quite circular part 161 of the slot in the said lever, as at the left, (see Fig. 1,) and at the right, Fig. 4, comes under the said roll 156, when the said part 161 acts as a lock to hold up the slide 154, even after the projection 135 has left the roll 153.

The slide 154 is in practice made in two parts connected by a bolt 164, to thereby enable the slide to be of greater or less length. The pinions a' and a^4 readily engage one with the other when the jack is brought up into working position, it being normally held in such position by the spring 50.

In this machine the cutter commences to trim the heel at the center of its rear side, and in practice the sector 148 is made first to descend and rotate the heel-pattern plate, and with it the heel, the head of which is held against it until the said heel is trimmed to the breast-corner on one side, and then the motion of the sector is reversed, causing the heel-pattern plate and heel to be turned in the opposite direction to enable the cutter to again act from the back of the heel to the other breast-corner. During the time that the cutter acts on the sides of the heel the swing-frame is moved to carry the cutter horizontally, or substantially so, along the sides of the heel, the rotation of the latter and the plate being very slow or nearly suspended.

I claim—

1. In a heel-trimming machine, the swing-frame, a rotating shaft, an attached rotating cutter, and frame to sustain the said shaft, combined with the rotating cam-wheel, and connecting devices between the said cam-wheel and swing-frame to swing the latter and move the rotating cutter horizontally, as and for the purposes set forth.

2. In a heel-trimming machine, the swing-frame, a rotating shaft, and a rotating cutter thereon, and frame to sustain the said shaft in order that it may be moved with the said swing-frame, combined with the rotating cam-wheel, and adjustable links between the said cam-wheel and swing-frame to swing the latter according to the requirements of the cam in the cam-wheel, substantially as described.

3. In a heel-trimming machine, the swing-frame to impart to the cutter-shaft and cutter a movement along the side of the heel, and the rotating cam-wheel and connections between it and the said swing-frame, combined with a clutch mechanism to actuate the said cam-wheel at intervals, substantially as described.

4. In a heel-trimming machine, the cam-wheel, the worm-shaft, and the worm-gear moved continuously by it, combined with the gear 117 and clutch mechanism between the said gears, to operate substantially as described.

5. In a heel-trimming machine, the cam-wheel, the worm-shaft, and the worm-gear moved continuously by it, combined with the gear 117, and clutch mechanism between the said gears, and a clutch-controlling device and means to automatically operate it to effect the release of the said clutch at the proper times, substantially as described.

6. In a heel-trimming machine, the cam-wheel and the sector actuated thereby, combined with the jack, its shaft a, gear a', and pinion a^4, actuated by the said sector, substantially as described.

7. In a heel-trimming machine, the cam-wheel, its projection 135, and the rocker-frame, combined with the slide actuated by the said projection and connected to the said rocker-frame, substantially as described.

8. In a heel-trimming machine, the cam-wheel, its projection 135, and the rocker-frame, combined with the slide actuated by the said projection and the cam-lever, to operate substantially as described.

9. In a heel-trimming machine, the jack, its shaft, and pattern-plate, combined with the sector, and gearing between it and the said shaft to partially rotate the same in opposite directions, and a cam to actuate the said sector, 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:
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H. P. FAIRFIELD.