

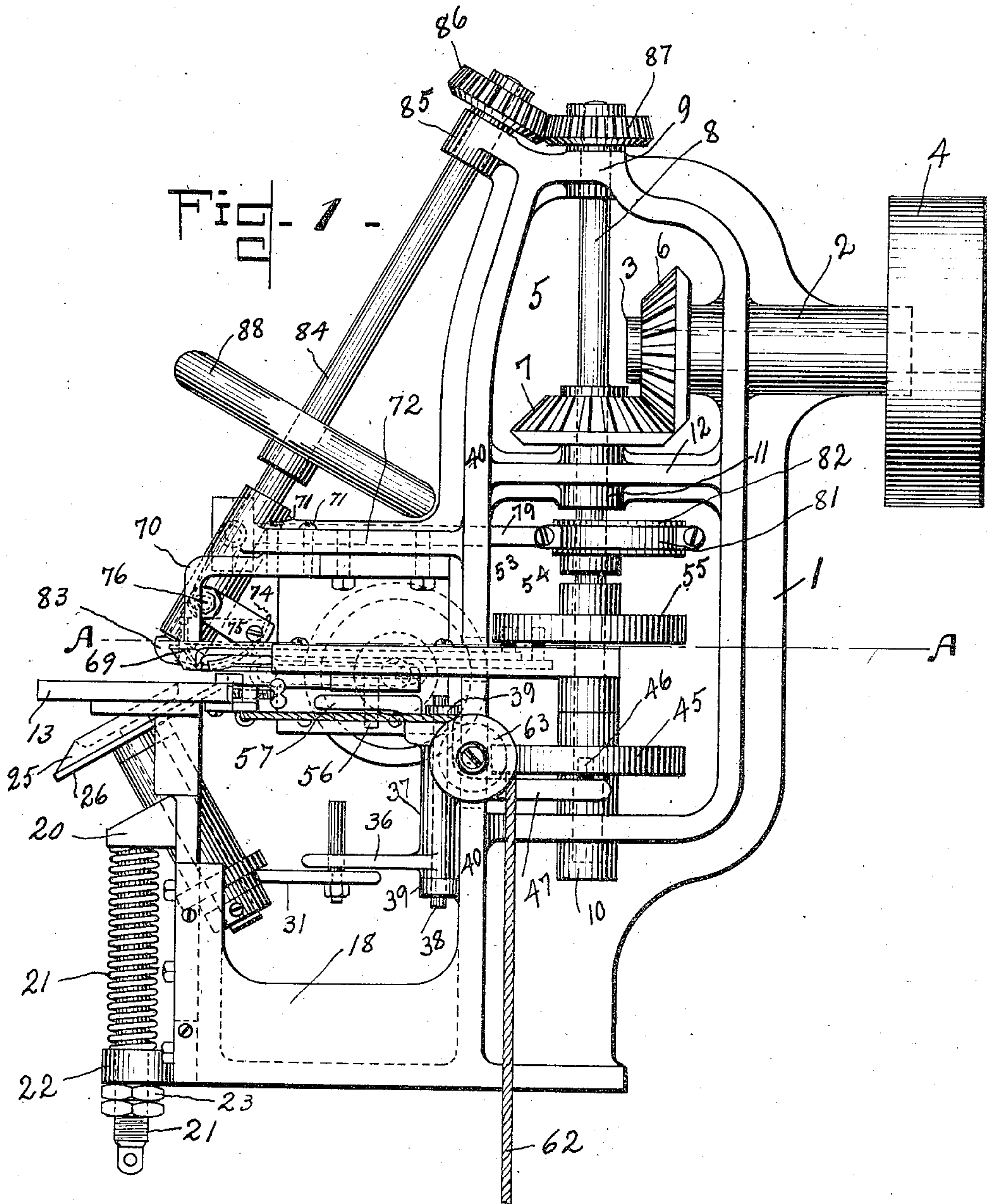
No. 861,361.

PATENTED JULY 30, 1907.

C. L. EATON.  
MACHINE FOR MAKING INSOLES.

APPLICATION FILED JULY 20, 1905.

5 SHEETS—SHEET 1.



Witnesses.

A. E. Ellis  
May A. Kenney

Inventor.

Charles L. Eaton,  
By his Attorney,  
J. H. Anderson

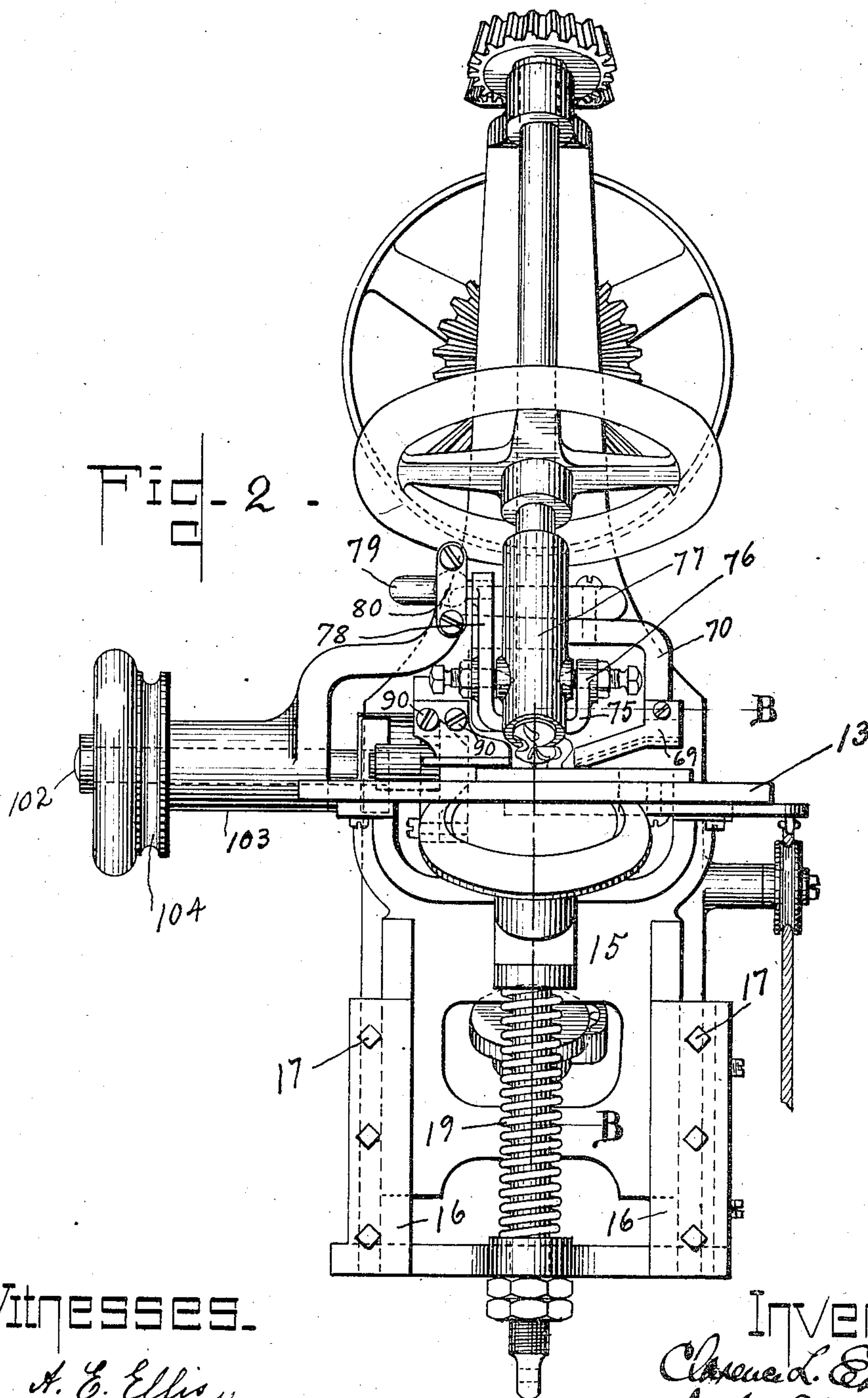
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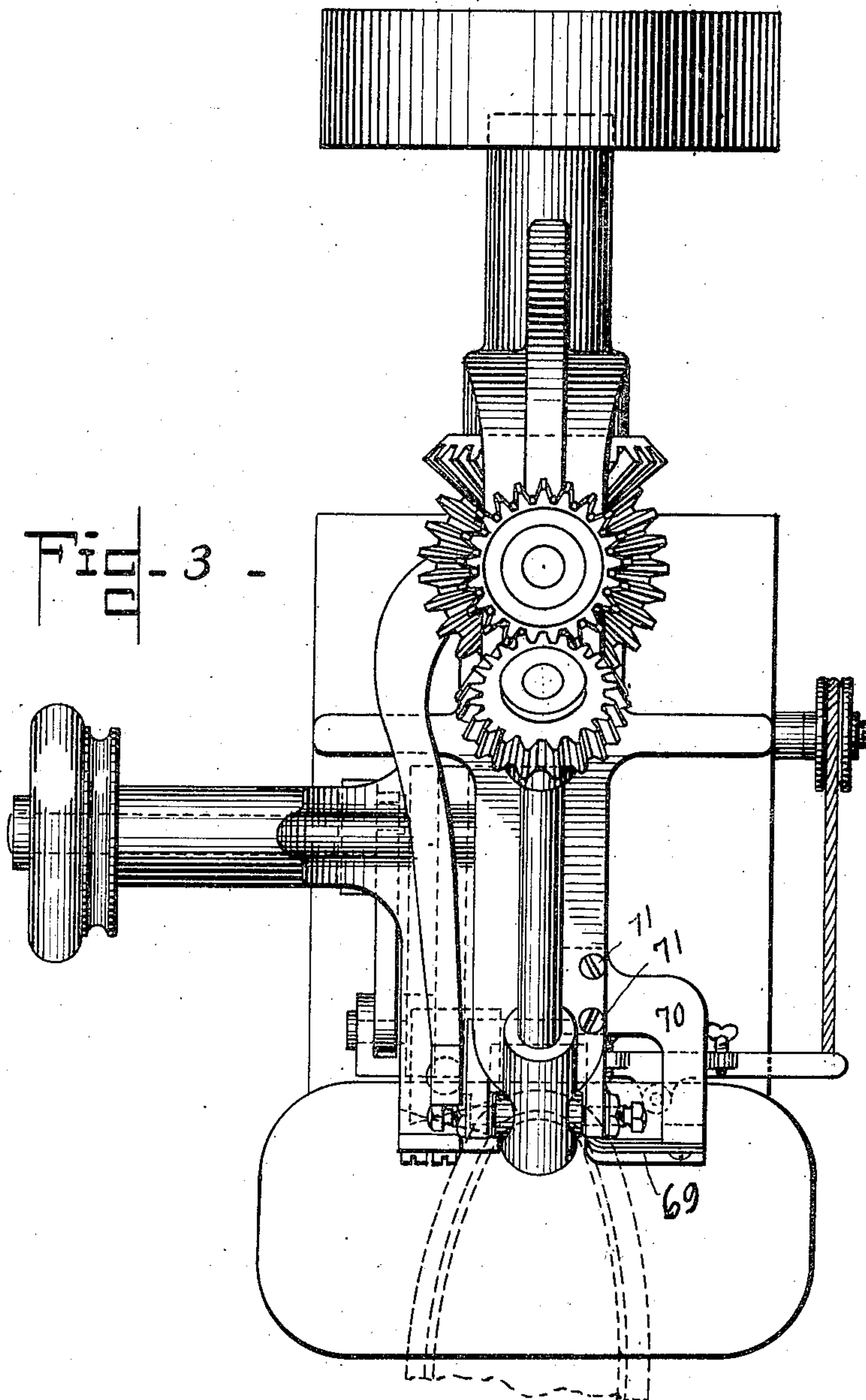
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5 SHEETS—SHEET 3.



Witnesses.

May T. E. Werner.

May A. Keeney

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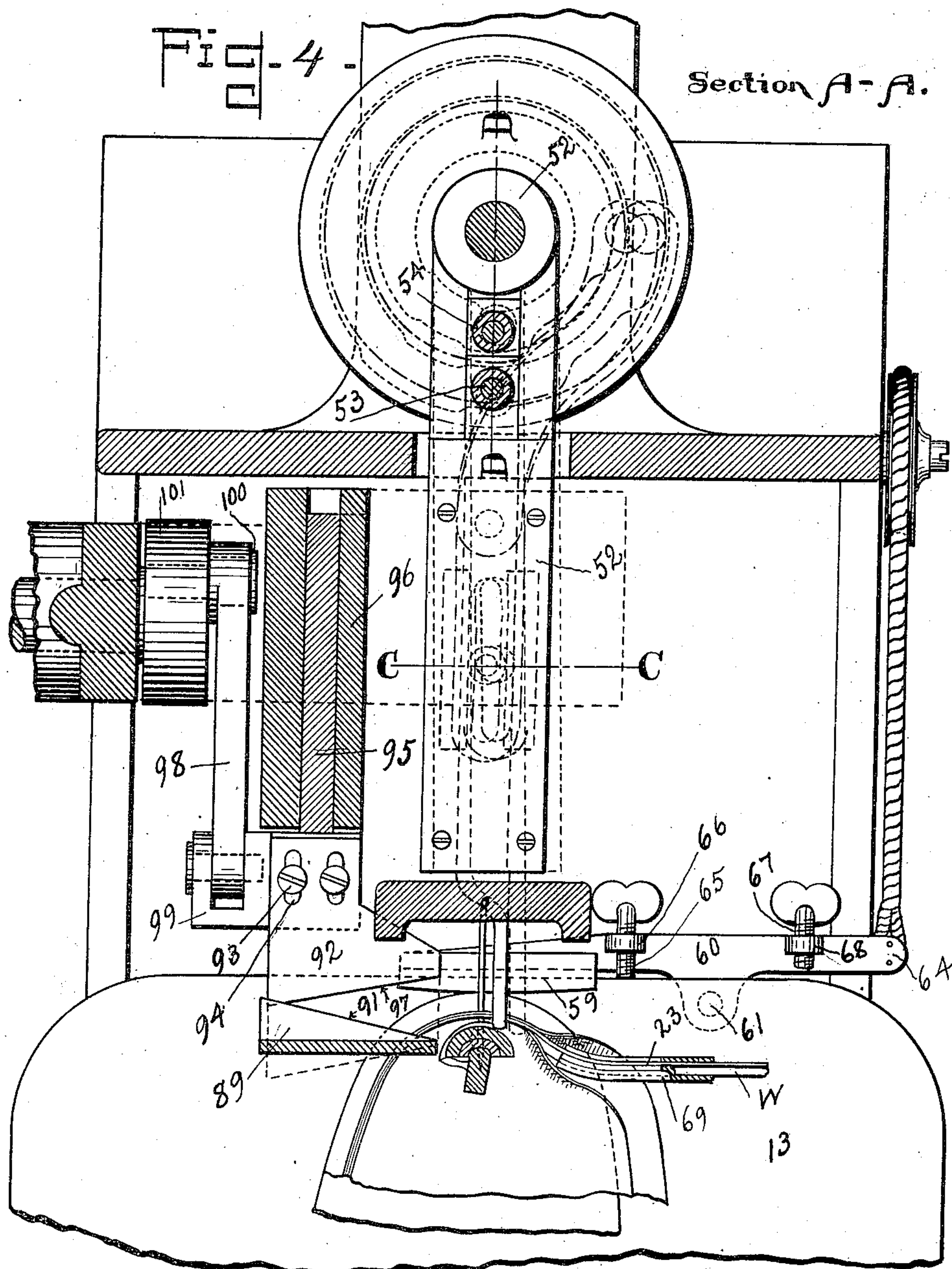
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5 SHEETS—SHEET 4.



Witnesses.

May T. E. Werner  
May A. Keimay

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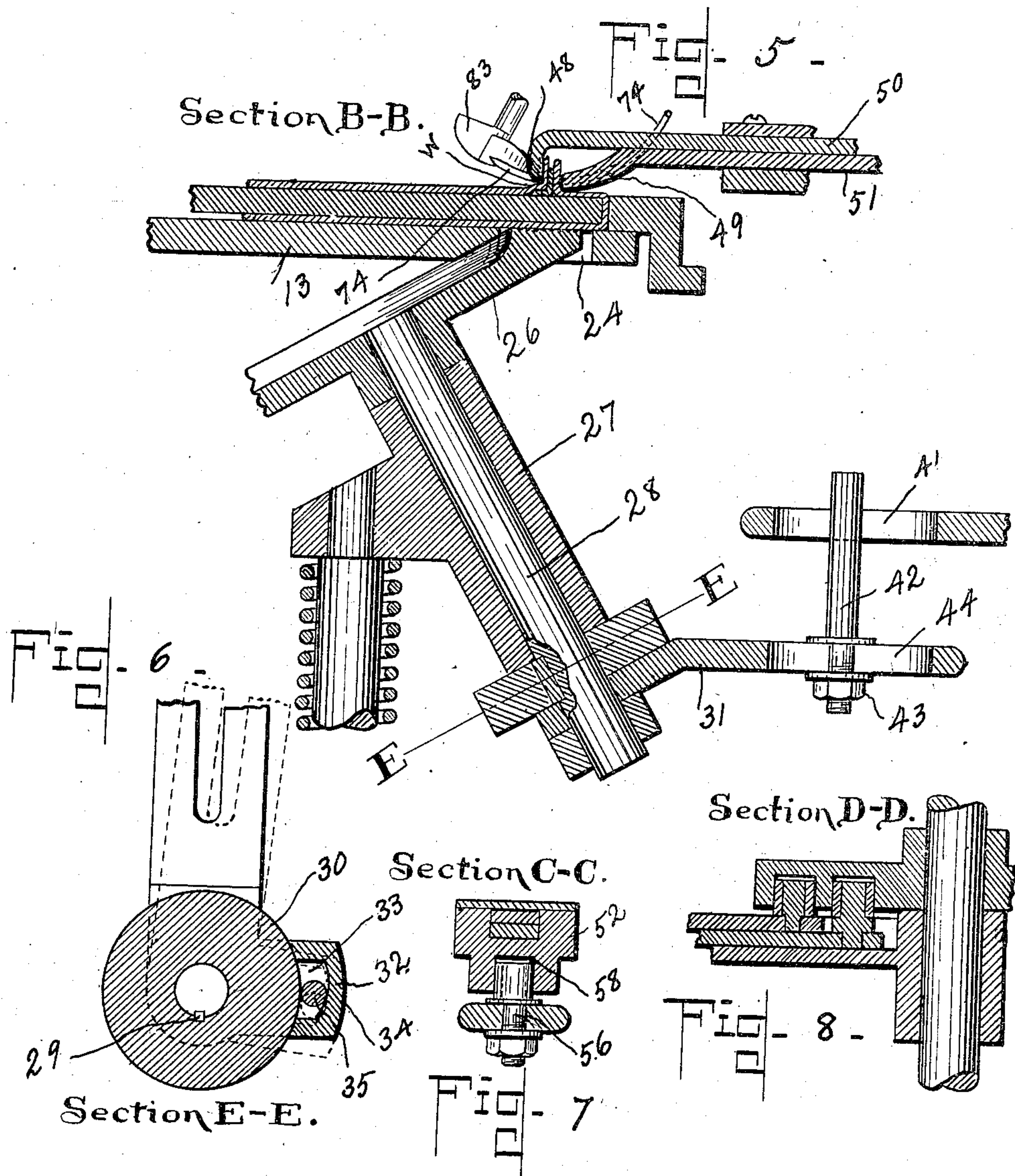
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5 SHEETS—SHEET 5.



Witnesses.

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# UNITED STATES PATENT OFFICE.

CLARENCE L. EATON, OF WORCESTER, MASSACHUSETTS.

## MACHINE FOR MAKING INSOLES.

No. 861,361.

Specification of Letters Patent.

Patented July 30, 1907.

Application filed July 20, 1905. Serial No. 270,477.

*To all whom it may concern:*

Be it known that I, CLARENCE L. EATON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have  
5 invented certain new and useful Improvements in Machines for Making Insoles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.  
10 The present invention relates to machines for making insoles for boots and shoes and it has particularly for its object the production of a simple and efficient machine designed to make a new form of what is generally known in the trade as a reinforced or composite insole,  
15 comprising a body portion of leather, felt or other suitable material, and a covering of leather, canvas or other suitable material, which soles are now generally used in the manufacture of welted shoes and have largely superseded the use of all leather insoles.  
20 One type of insole which the present machine is designed to make comprises a body portion without lip or feather and a reinforcing covering of leather or canvas or other suitable material, the covering on the under surface of the sole having its edge turned at right  
25 angles to the face of the body portion and the covering for the upper surface of the body portion extending around and over the edge of the body portion, with its edge turned outwardly within the marginal line of the body portion and at some distance in from the edge,  
30 and together with a reinforcing welt or tape stitched to the out-turned edge of the covering of the under surface. Thus the out-turned edges of the respective coverings together with the reinforcing welt or tape forms the lip or shoulder to which the upper and welt  
35 of the shoe will be secured.  
The present machine is designed to progressively and step by step form and press the out-turned edges of the reinforcing coverings towards each other, causing them to stand at right angles to the under surface of the  
40 sole and to progressively and step by step deliver and place between the out-turned edges of the reinforcing coverings the reinforcing welt or tape, and by means of sewing instrumentalities secure the covering by a line of stitches passing through the out-turned edges  
45 of the coverings and interposed welt or tape near the base thereof, thereby forming the lip and securing the covering to the body portion and progressively as the work advances by a suitable trimming mechanism to trim off the outstanding edges of the reinforcing covering,  
50 ing, so that they will be of uniform height.

To the above ends the present invention consists of the devices and combinations of devices which will be hereinafter described and pointed out in the claims.

The present invention is illustrated in the accompanying drawings, in which:—  
55

Figure 1 shows a right hand side elevation of the head of my improved machine; Fig. 2 shows the machine in front elevation; Fig. 3 shows a top plan view of the machine; Fig. 4 shows an enlarged sectional view taken on the line A—A, shown in Fig. 1, many of  
60 the parts, however, being shown in plan; Fig. 5 shows a vertical sectional view of portions of the feed mechanism taken on line B—B, Fig. 2; Fig. 6 shows a sectional view of a part of the feeding mechanism taken on the line E—E, Fig. 5; Fig. 7 shows a sectional view  
65 taken on the line C—C, Fig. 4; Fig. 8 shows a sectional view taken on the line D—D, Fig. 4.

Similar reference characters will be used throughout the specification and drawings to designate corresponding parts.  
70

In the drawing, 1 represents a suitable head or frame upon and within which are mounted and supported the operating instrumentalities of the machine, and which head or frame may be mounted and supported upon a suitable base or standard (not shown)  
75 or on a suitable table or work support as may be desired.

Formed in the head or frame 1 is a bearing 2, within which is mounted to revolve the main shaft 3, which is provided with a pulley 4, and by means of which  
80 the said shaft 3 will be driven by a belt from any suitable source of power.

At its opposite end within the opening 5 of the frame or head 1, the main shaft 3 carries a beveled gear 6 which meshes with and drives a similar gear  
85 7 mounted upon the vertically disposed shaft 8; which shaft is mounted to turn in suitable bearings 9 and 10 formed in the head or frame 1, and a bearing 11 formed in the cross brace 12 of the head or frame 1.

The shaft 8 carries all the operating cams, gears and  
90 eccentrics from which the various parts of the feeding, forming and sewing instrumentalities are operated, all as will be hereinafter described.

The machine comprises at its forward portion a suitable work support upon which the work is supported and over which it is moved as the formation  
95 of the insole progressively advances, and this work support comprises a table 13 mounted upon or secured to and projecting at right angles from a vertically movable slide 15 held to move in guides 16 secured  
100 by bolts 17 to the front of the frame or head 1, or to be more exact, to a forwardly projecting portion 18 of the head or frame 1.

The work table 13 is normally held in its elevated position by means of a strong spiral spring 19 which  
105 at its upper end bears against the under side of an abutment or block 20, to which is secured a rod 21 which the spring 19 surrounds, the said rod passing through a guide 22 on the forward portion 18 of the frame or head 1, and against the upper face of which  
110



the lower end of the spring 19 is seated. The rod 21 below the guide 22 is provided with stop nuts 23 engaging the threaded portion of said rod and which nuts limit the upward movement of the slide 15 and the work support 13.

The lower end of the rod 21 is intended to be connected to a cord or chain and a foot treadle, (not shown, but a construction which is well known to those skilled in this art) by means of which the work supporting table and the attached parts may be depressed for the purpose of inserting and removing the work.

The work table 13 is cut out as shown at 24 in Fig. 5, immediately below the point of operation of the forming and pressing tools and sewing instrumentalities upon the work, for the purpose of permitting the beveled peripheral edge 25 of the feed wheel 26 to pass into the recess 24 in the work table 13 and to engage the lower surface of the insole as shown in Fig. 5, for the purpose of cooperating with the forming and pressing tools in progressively feeding or advancing the sole.

As will be hereinafter fully described, the forming and pressing tools when in contact with the lip or shoulder of the insole are moved a short distance to the left (looking at Fig. 2 of the machine), and it is intended that the feed wheel 26 shall be revolved intermittently so as to carry its upper edge along to the left at the same time that the work is advanced by the forming and pressing tools, and while said tools have a movement in the reverse direction, it is intended that the feed wheel 26 shall have an intermittent or step by step revolution to advance the work without any liability of its moving in the reverse direction. This is accomplished in the following manner:—The slide 15 carries an angularly disposed bearing 27 in which is mounted to turn the spindle 28 to the upper end of which the feed wheel 26 is secured and at its lower end the spindle 28 has securely fastened to it by means of a spline 29 a disk or collar 30. Below the disk or collar 30 there is mounted upon the spindle 28 so as to rock thereon a bent lever 31, which has an offset arm 32 which projects upwards and overlaps a portion of the periphery of the disk or collar 30, and in which is provided a recess 33 having a cam face 34 and a ball pawl 35, the arrangement being such that as the bent lever 31 is rocked from side to side, when moving in the direction to carry it to the position shown in dotted lines Fig. 6, the ball pawl will release the peripheral edge of the collar 30 and no movement will be imparted to the spindle 28 and the feed wheel 26; but when rocked in the opposite direction, or as shown by full lines in Fig. 6, the ball pawl 35 binding against the cam face 32 of its recess, will pinch and grip the peripheral edge of the collar 30, thus causing the spindle 28 to turn with the bent lever 31 and imparting a partial turning movement to the feed wheel 26, all as will be shown clearly from an inspection of the drawings.

The lever 31 is rocked by means of an arm 36 projecting from a sleeve 37 mounted on a shaft 38 held in bearings 39 attached to the frame or head 1, or that portion 40 of the frame or head, which arm 36 is provided at its forward end with a slot 41 which engages a vertical stud 42 and adjustably secured by means of a nut 43 in a slot 44 of the bent lever 31. The sleeve 37 and arm 36 are

rocked from side to side by means of a cam 45 mounted upon the vertical shaft 8, which has a suitable cam path in which engages a cam roll 46 carried by an arm 47 projecting rearwardly from the sleeve 37.

It will be seen that the rotation of the shaft 8 will, through the cam 45, impart a rocking movement to the arm 47 and thence through the sleeve 37, arm 36 and bent lever 31, and the pawl or clutch connection between the spindle 28 impart an intermittent or step by step rotation of the feed wheel, but that no movement of the feed wheel in the reverse direction will be permitted.

The forming and pressing tools are shown in sectional view, Fig. 5, and in side elevation Fig. 1, and comprise what might be termed the inside tool 48 and the outside tool 49. These terms are used to indicate that the tool 48 operates upon the inside of the lip and as an abutment against which the outside tool 49 which operates upon the outside of the lip, is arranged to press the lip. As a matter of fact, the tools each have a clamping movement toward and from each other by means of which they grip and compress the outstanding edges of the reinforcing and covering material and the inclosed welt strip in the formation of the lip. To this end the pressing and forming tools 48 and 49 are reciprocated toward and from each other and with such time relation that they will be moved toward each other to grip the material, then simultaneously moved laterally to feed the material, thence away from each other to release the material and thence return to their original position preparatory to again engaging the material and forming and pressing the lip.

The tool 48 is carried upon a slide 50 and the tool 49 upon a slide 51, both slides being arranged to reciprocate in a guide 52 pivotally supported at its rear end upon the shaft 8, and as will be hereinafter described, arranged to move laterally for the purpose of moving the forming and pressing tools laterally.

The slides 50 and 51 at their rear ends are provided respectively with cam rolls 53 and 54, which engage suitable cam paths in the under face of a cam 55 mounted upon the vertical shaft 8, which cam paths will be suitably formed to impart horizontal reciprocations to the slides 50 and 51 for the purpose of moving the inside tool 48 and the outside tool 49 in suitable time relation to each other so as to move said tools away from each other to release the work and towards each other to press and form the lip and the inclosed welt strip.

The guide 52 upon its under side is provided with a groove 58 engaged by a stud 56, which is adjustably mounted in the arm 57 projecting forwardly from the upper end of the sleeve 37, and by means of which the guide 52 is rocked laterally about the shaft 8, and thus the forming and pressing tools 48 and 49 are moved laterally as described to assist in feeding the work.

It will be noted that the sleeve 37 imparts a lateral movement to the guide 52 and the tools, and also an intermittent rotation to the feed wheel 26 and therefore the intermittent partial turning of the feed wheel 26 and the tools 48 and 49 occur simultaneously, so that the work will be gripped between the beveled peripheral face 25 of the feed wheel and the tools 48 and 49 and moved positively to the left to feed the work intermittently as the work proceeds, all of which will be clear from an inspection of the drawings.



The stud 56 as shown in Fig. 7, will be adjustably mounted in the arm 57 and will engage a groove 58 in the under face of the guide 52, so that by adjusting the stud 56 longitudinally along its slot 57 and adjusting the stud 42 along the slot 44 in the bent lever 31, the stroke or length of feed of the wheel 26 and the tools 48 and 49 will be accurately adjusted.

A suitable edge guide 59 to engage the edge of the insole as it lays and moves upon the surface of the work table 13 will be provided and will be of any desirable shape, that shown in Fig. 4 answering the purpose, and it will be mounted upon a rocking arm 60 pivoted at 61 to the under surface of the table 13, and normally held in its advanced position by means of a weight (not shown), secured to the end of a cord or rope 62 which passes over a guide pulley 63, and at its forward end is attached to the end 64 of the lever 60. This arrangement rocks the lever 60 about its pivot 61, and holds the guide 59 in its advanced position, which advanced position may be adjusted by means of a stop screw 65 mounted in a threaded boss 66 and a similar stop screw 67 mounted in a boss 68 will limit and determine the rearward movement of the guide 59 as the edge of the sole is pressed against said guide. The stops 65 and 67 engage the edge of the work table 13, all as clearly shown in Figs. 1 and 4.

As before intimated, it is intended that a welt strip lettered *w* in Fig. 5, shall be bent angularly having a portion resting upon the surface of the body portion of the insole and a portion extending vertically between the out-turned edges of the reinforcing coverings and for the purpose of properly guiding the welt strip *w*, there is provided what will be called a welt guide 69, shown in Fig. 4 and in Fig. 1, which welt guide is carried at the lower end of an arm 70 attached by bolts 71 to the under surface of an arm 72 projecting from the upright portion 40 of the frame or head 1. The welt guide is also shown in Fig. 2, and comprises an angularly bent piece of sheet metal having a channel 73 through which the welt strip passes and by means of which it is bent angularly as shown in Fig. 4, and the forward or outlet end of the guide 69 is preferably bent or curved as shown clearly in Fig. 4, so as to fit between the up-turned edges of the reinforcing coverings and correctly deliver the angularly bent welt strip to the action of the tools.

After the forming and pressing tools 48 and 49 have pressed the outer edges of the reinforcing material and the welt strip *w* closely together, the projecting lip thus formed is as heretofore intimated stitched together by a line of stitches passing through the projecting lip near the base or close to the surface of the sole and for this purpose there is provided in the machine any usual or desired form of sewing mechanism, that shown in the drawing consisting of a chain stitch mechanism and comprising a curved hooked needle 74 of the usual form mounted in a needle segment 75 pivoted at 76 to a cylindrical bearing 77 and through an arm 79 pivotally connected by preferably a ball joint 80, the needle segment 75 is oscillated to advance and retract the needle all in a manner usual in sewing machines. The link 79 is pivotally connected to a band 81 which surrounds an eccentric 82 mounted upon the vertical shaft 8. Co-operating with the curved hooked needle is a hook 83 of a type usual in the chain stitch

sewing mechanism and which is mounted at the lower end of a rotary shaft 84, mounted in the inclined bearing 77, and a bearing 85, the said shaft being rotated by means of a beveled pinion 86 meshing with a similar pinion 87 on the upper end of the vertical shaft 8. The shaft 84 is preferably provided with a hand wheel 88.

It is believed unnecessary to describe the operation of the sewing mechanism, as the needle and the hook operate in the usual manner, the needle passing through the material, being supplied with a loop of thread, and delivering to and receiving from the rotating hook 83 the successive loops whereby the usual chain stitch is formed. After the lip has been sewed together as described, the projecting edges thereof are trimmed off and for this purpose there is provided a trimming mechanism comprising two cutters, a cutter 89 fixed by means of screws 90 to the front of the machine frame and having a beveled cutting edge 91 and a co-operating reciprocating cutter 92 adjustably mounted by means of screws 93 passing through slots 94 to the forward end of a reciprocating slide 95 arranged to reciprocate in a fixed guide-way 96. The cutter 92 also has a beveled edge 97, whereby and co-operating with the beveled edge 91, a shearing cut is produced.

The cutter 92 is reciprocated by means of a link 98 pivotally connected at one end to a block 99 upon which the cutter is mounted, and at its opposite end to a crank pin 100 mounted upon a crank 101, carried by a horizontal shaft 102, mounted in a bearing 103, and driven by means of a pulley 104, whereby the cutter 92 is rapidly reciprocated and in co-operation with the cutter 91, trims the projecting edge of the lip as the material is fed along.

I have not illustrated or described any of the stitch forming mechanism except the curved hooked needle and the thread hook, as it has not been deemed necessary for me to show any of the other devices, such as the thread supply, tension and other guides, etc. These devices will be the same as those ordinarily embodied in sewing machines and their construction, organization and mode of operation is well known to those skilled in the sewing machine art. Furthermore, I desire to state that I do not limit my invention to a machine adapted to unite the out-turned edges of the reinforcing coverings and the interposed welt by sewing as such may be omitted and the reinforcing coverings and the interposed welt united to the body portion of the insole and to each other by means of glue or cement.

The operation of my invention is as follows:—The body portion of the insole having been prepared in the usual manner by "rounding" it and imparting thereto the desired shape and configuration, and the reinforcing coverings having been cut out of a sheet of canvas or leather as desired, but preferably canvas because of its great strength in resisting the lateral strains imparted by the upper when attached thereto, and the covering for one surface of the body portion being somewhat larger than that of the other portion so as to be turned over the edge thereof as shown in Fig. 5, such coverings are coated with cement and temporarily secured to the opposite face of the body portion. The insole is then laid upon the work table with what will be the upper surface thereof against the work table and the under surface or tread surface uppermost. The



edges of the reinforcing coverings are turned up as shown in Fig. 5, and the welt interposed between the out-turned edges of the reinforcing coverings with a portion of said welt turned at right angles and inserted beneath the reinforcing coverings as shown in Fig. 5. The machine now being set in operation the forming and pressing tools move towards each other and pinch, shape and press the edges of the reinforcing coverings and the interposed welt together, such action causing a stretching and smoothing of the reinforcing coverings as will be readily understood. While the forming and pressing tools hold the material as shown in Fig. 5, they are moved laterally to the left a short distance for the purpose of feeding the work and simultaneously therewith the feed wheel is rotated a short distance so that the insole is moved laterally between the two feed mechanisms. After the forming and pressing tools have moved to the full stroke to the left, they move away from each other, releasing the work, then return to their original position and again grip and form the material preparatory to again feeding it. During the return movement of the forming and pressing tools the needle is advanced and retracted forming a stitch at the base of the lip formed by the action of the forming and pressing tools. The trimming knives in the meantime are constantly operating and as the formed lip is passed within their range of movement, they operate to trim off to a uniform height the edges of the reinforcing coverings, substantially in line with the upper edge of the interposed welt.

Having described my invention, I claim as new and desire to secure by Letters Patent of the United States:—

1. In a machine for making insoles, a work support, combined with forming and pressing tools and means to reciprocate said tools towards and from each other in a plane parallel to the surface of the work support to cause them to engage and press together the edges of the reinforcing coverings at right angles to the face of the sole and within the marginal edge thereof, substantially as described.
2. In a machine for making insoles, a work support, combined with forming and pressing tools and means to reciprocate said tools towards and from each other in a plane parallel to the surface of the work support to cause them to engage and press together the edges of the reinforcing coverings at right angles to the face of the sole and within the marginal edge thereof and means to unite said marginal edges, substantially as described.
3. In a machine for making insoles, a work support, combined with forming and pressing tools and means to reciprocate said tools towards and from each other in a plane parallel to the surface of the work support to cause them to engage and press together the edges of the reinforcing coverings at right angles to the face of the sole and within the marginal edge thereof, and means to unite the outturned edges of the reinforcing coverings at the base thereof and near the surface of the sole, substantially as described.
4. In a machine for making insoles, a work support, combined with forming and pressing tools and means to reciprocate said tools towards and from each other in a plane parallel to the surface of the work support to cause them to engage and press together the edges of the reinforcing coverings at right angles to the face of the sole and within the marginal edge thereof, and a stitch forming mechanism for uniting the outturned edges of the reinforcing coverings, substantially as described.
5. In a machine for making insoles, a work support, combined with forming and pressing tools and means to operate said tools to cause them to engage and press to-

gether the edges of the reinforcing coverings at right angles to the face of the sole and within the marginal edge thereof, and means to deliver a welt strip between the outturned edges of the reinforcing materials as they are pressed together, substantially as described.

6. In a machine for making insoles, a work support, combined with forming and pressing tools and means to operate said tools to cause them to engage and press together the edges of the reinforcing coverings at right angles to the face of the sole and within the marginal edge thereof, means to deliver a welt strip between the outturned edges of the reinforcing coverings and means to secure such out-turned edges and the interposed welt strip together, substantially as described.

7. In a machine for making insoles, a work support, combined with forming and pressing tools and means to operate said tools to cause them to engage and press together the edges of the reinforcing coverings at right angles to the face of the sole and within the marginal edge thereof, means to deliver a welt strip between the outturned edges of the reinforcing coverings and a stitch forming mechanism for securing together the outturned edges of the reinforcing coverings and the interposed welt strip at the base thereof, and near the surface of the sole, substantially as described.

8. In a machine for making insoles, a work support, combined with forming and pressing tools and means to reciprocate said tools towards and from each other in a plane parallel to the surface of the work support to cause them to engage and press together the edges of the reinforcing coverings at right angles to the face of the sole and within the marginal edge thereof, feeding mechanism, and trimming mechanism and means to operate said trimming mechanism to cause it to trim off the outturned edges of the reinforcing coverings, substantially as described.

9. In a machine for making insoles, a work support, combined with forming and pressing tools and means to operate said tools to cause them to engage and press together the edges of the reinforcing coverings at right angles to the face of the sole and within the marginal edge thereof, and a welt guide for guiding a welt strip between the out-turned edges of the reinforcing coverings, said guide constructed and arranged to impart an angular longitudinal bend to the interposed welt strip, substantially as described.

10. In a machine for making insoles, a work support, combined with forming and pressing tools, means to impart to said tools relative reciprocations towards and away from each other in a plane parallel to the surface of the work support and means to impart a simultaneous lateral movement to both of said tools, substantially as described.

11. In a machine for making insoles, a work support, combined with forming and pressing tools, means to operate said tools to cause them to grip and release the work substantially in a plane parallel with the surface of the work, a feed wheel and connected mechanism for imparting a lateral feed movement to the forming and pressing tools and a simultaneous partial rotation to the feed wheel, substantially as described.

12. In a machine for making insoles, a work support, combined with forming and pressing tools and means to reciprocate said tools towards and away from each other in a plane parallel to the surface of the work support to cause them to engage and press together the edges of the reinforcing coverings, a stitch forming mechanism and means to move said tools laterally to deliver the work to the stitch forming mechanism, substantially as described.

13. In a machine for making insoles, a work support, comprising a vertically movable spring sustained slide carrying a substantially horizontally disposed fixed table provided with a slot near its rear edge and a feed wheel supported below said table on an inclined axis and having a peripheral beveled edge working in the slot in the table, substantially as described.

14. The combination with the forming and pressing tools and the slides 50 and 51 carrying said tools, and the cam 55 connected with and operating said slides to impart simultaneous relative reciprocations to said slides and tools, substantially as described.



15. The combination with the forming and pressing tools and means to impart thereto relative lateral reciprocations towards and away from each other, the pivoted guide supporting said tools and means to rock said guide about its pivot, substantially as described.

16. The combination with the longitudinally reciprocating and laterally rocking forming and pressing tools and means for operating the same, of a work table and slot in said work table, a feed wheel exposed in said slot and means to

partially turn the feed wheel in time relation to the rocking of the forming and pressing tools, substantially as described.

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

CLARENCE L. EATON.

Witnesses:

ROBT. B. CLARK,

GEO. F. WIER.