

No. 897,328.

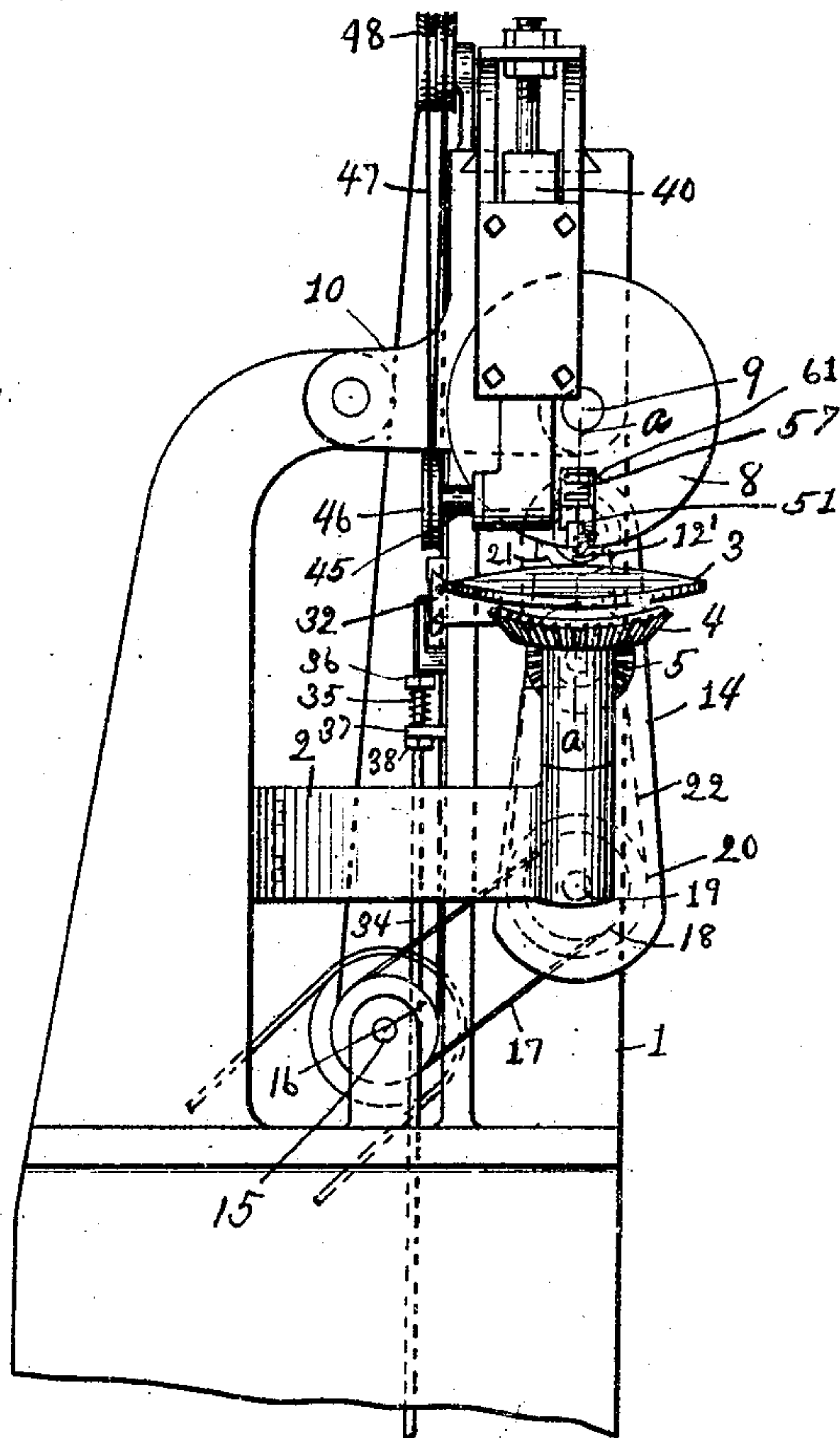
PATENTED SEPT. 1, 1908.

E. A. WEBSTER.  
SHOE CHANNELING MACHINE.

APPLICATION FILED MAY 15, 1907.

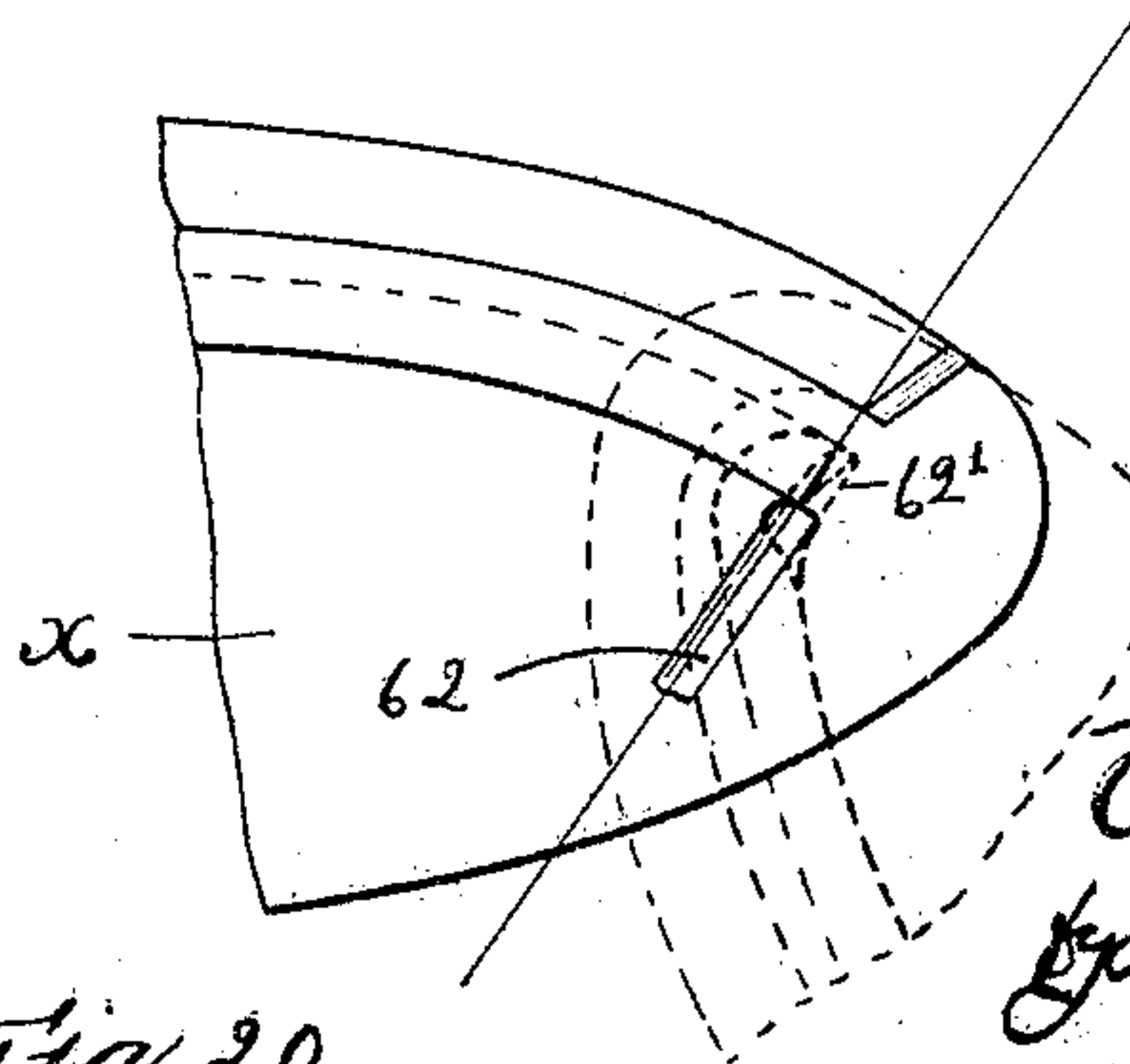
3 SHEETS—SHEET 1.

*Fig. 1.*



Witnesses:  
H. B. Davis.  
Cynthia Doyle

*Fig. 20.*



Inventor:  
Edwin A. Webster  
By August Hamman  
Attys

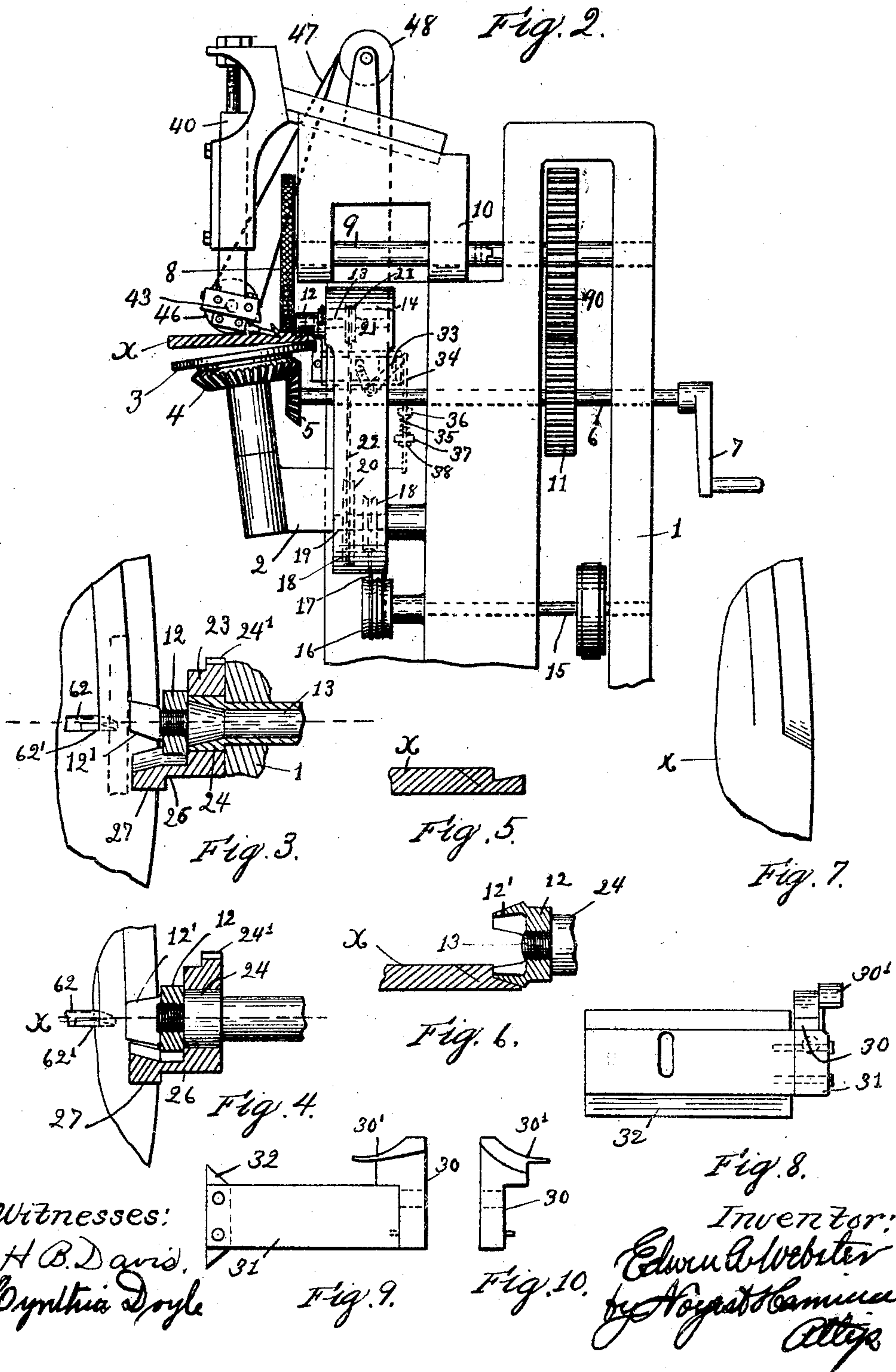
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3 SHEETS—SHEET 2.



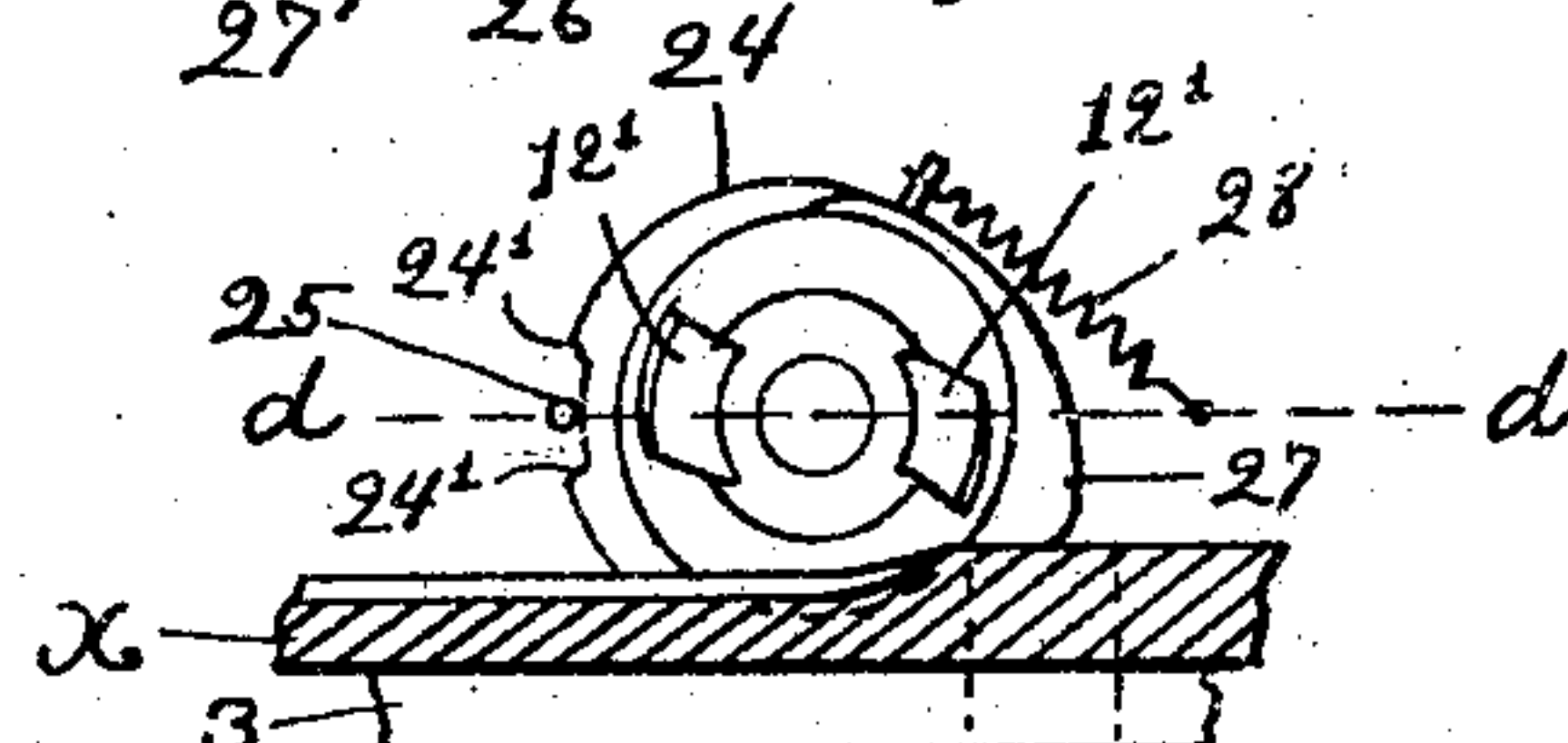
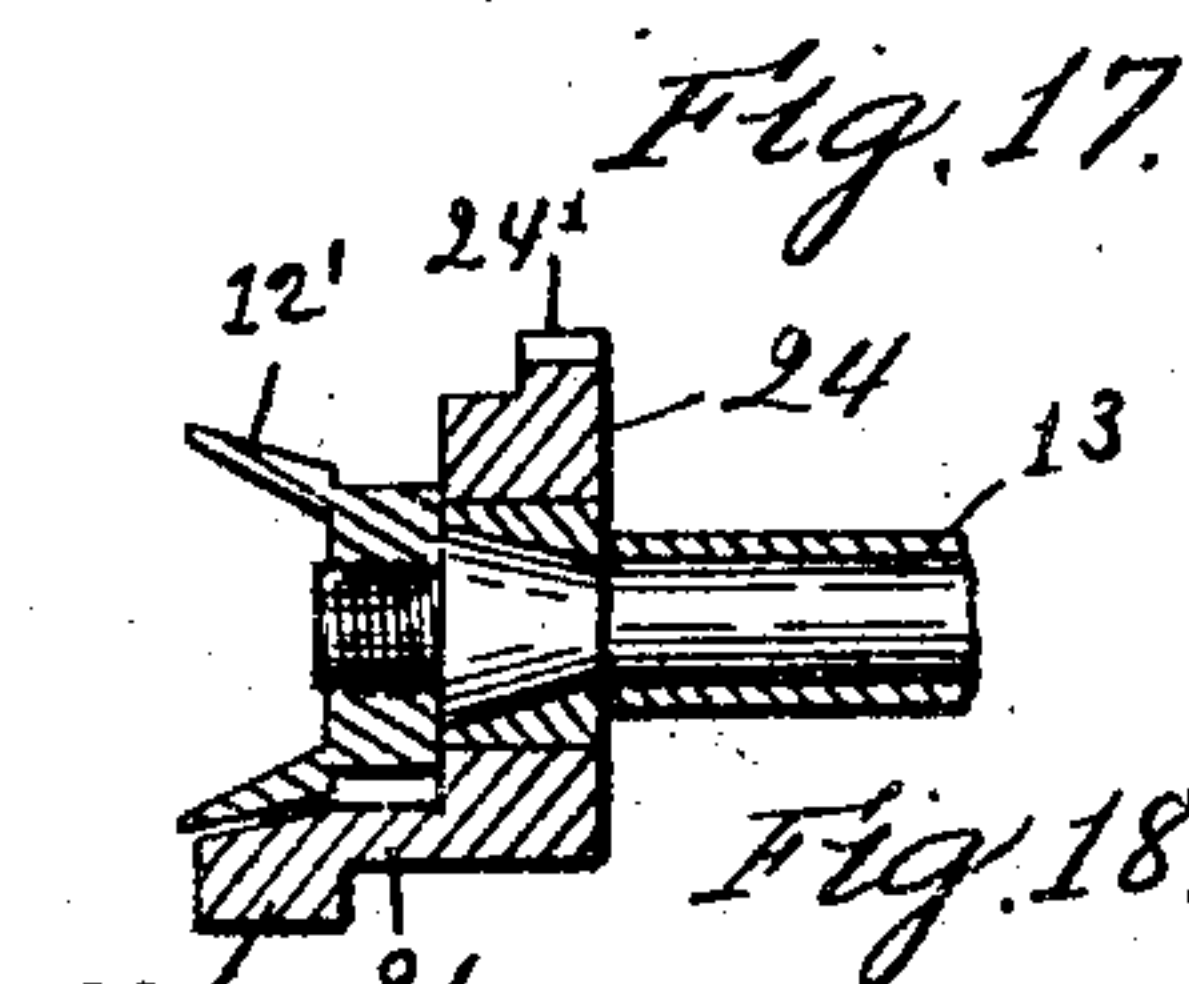
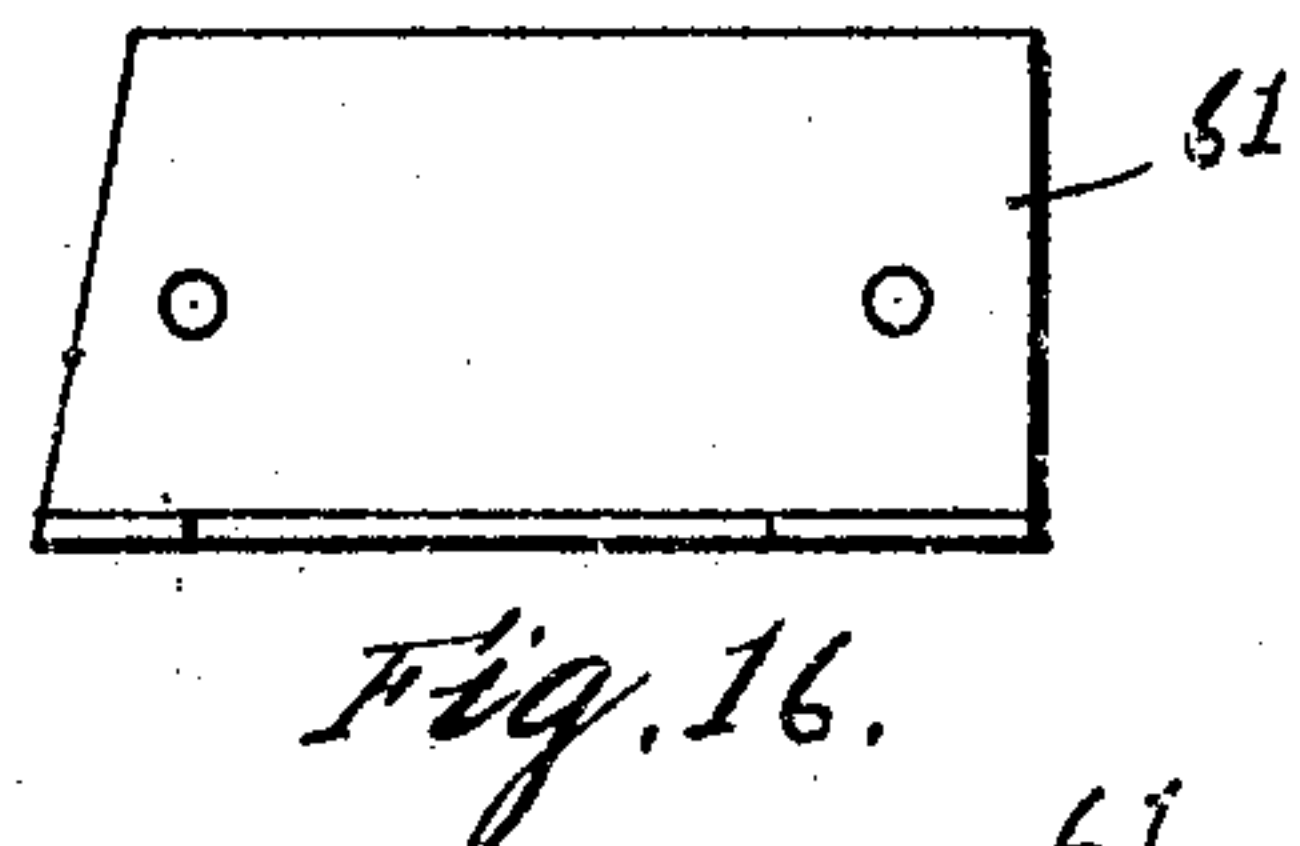
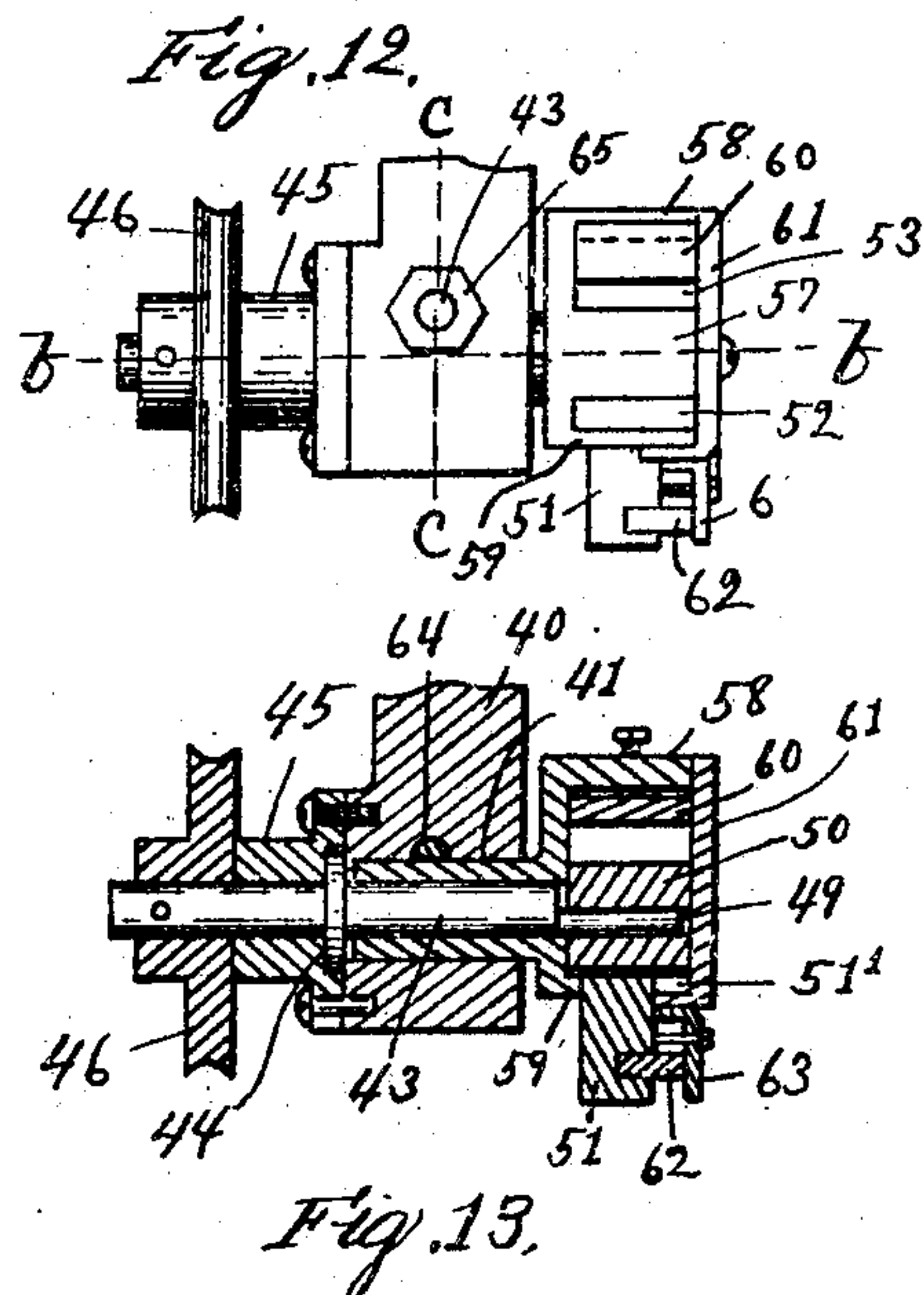
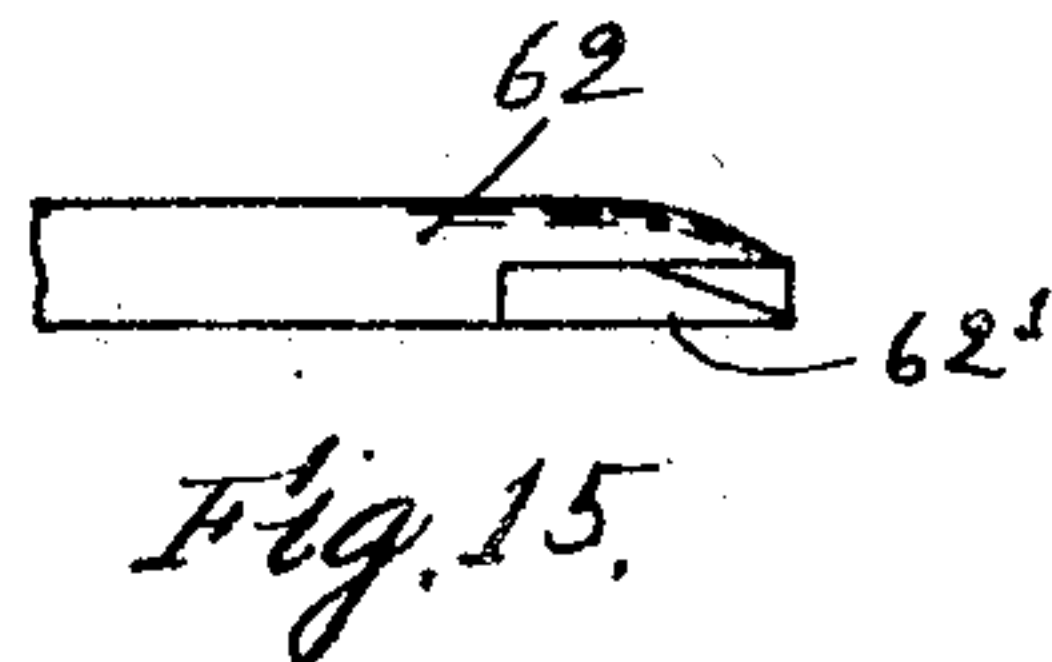
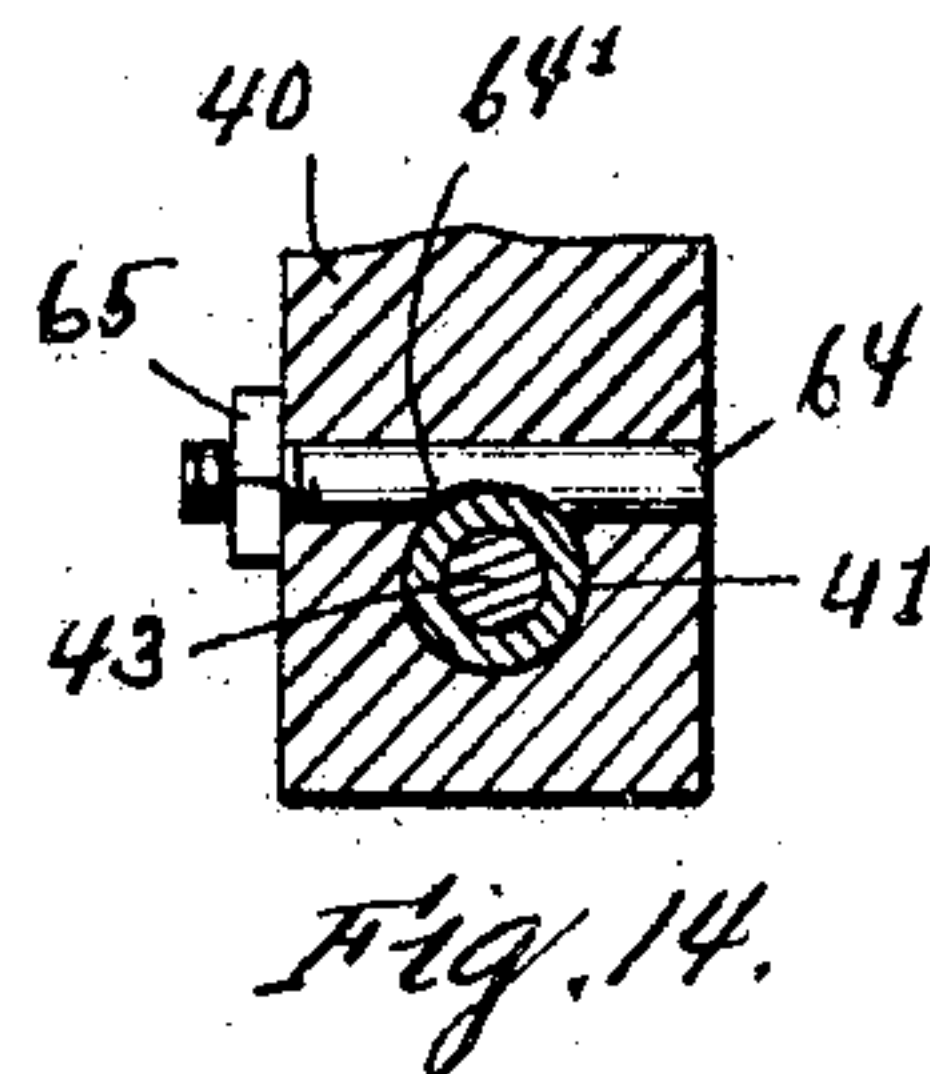
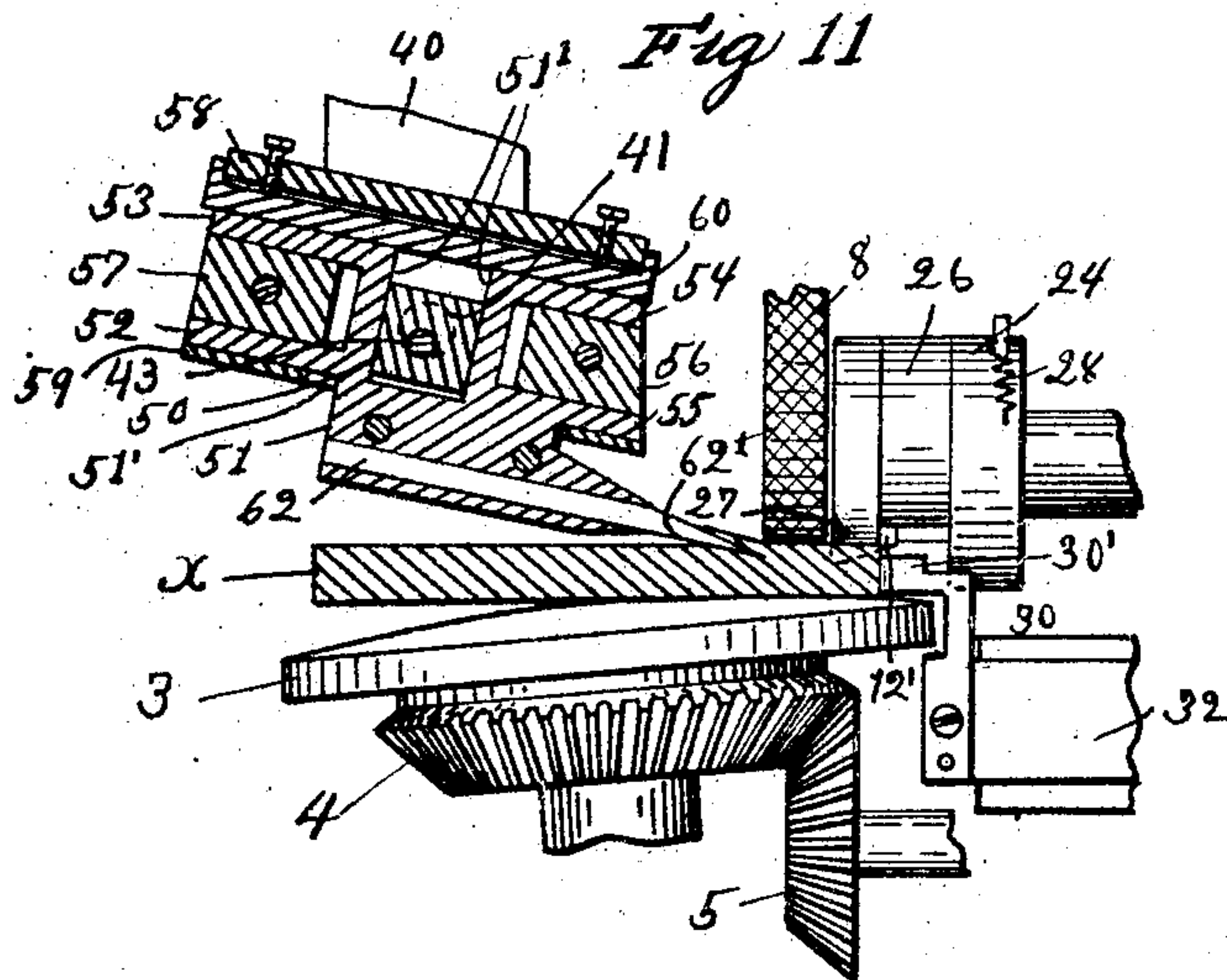
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3 SHEETS—SHEET 3.



Witnesses:  
H. B. Davie,  
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Fig. 19. Invention:  
Edwin A. Webster  
by Royce Hamman  
Att'y's



# UNITED STATES PATENT OFFICE.

EDWIN A. WEBSTER, OF GROVELAND, MASSACHUSETTS, ASSIGNOR TO HAVERHILL CHANNELING MACHINE COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

## SHOE-CHANNELING MACHINE.

No. 897,328.

Specification of Letters Patent.

Patented Sept. 1, 1908.

Application filed May 15, 1907. — Serial No. 373,726.

*To all whom it may concern:*

Be it known that I, EDWIN A. WEBSTER, of Groveland, county of Essex, State of Massachusetts, have invented an Improvement in Shoe-Channeling Machines; of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to certain improvements in a sole channeling machine of the character disclosed in my pending application Serial No. 297,094, filed January 22, 1906, in which the channel is cut by a reciprocating knife and the edge shoulder or upper receiving face is formed by a rotary knife.

In forming an upper receiving seat on the edge portion of a sole with a rotary knife, I have experienced much difficulty in causing the knife to remove the chips completely, particularly when the leather is soft and the knife became somewhat dulled, and to leave the edge of the sole smooth and clean-cut. In this connection one of the objects of the present invention is to provide means whereby the chips will be completely removed and the edge of the sole will be smooth and sharp at the end of the channeling operation, even though the leather is soft and the knife edge becomes somewhat dulled.

In channeling soles having pointed toes, I have experienced difficulty in preventing laceration of the channel flap at the toe, and a further object of my invention is to provide a form of knife, and relative adjustment thereof and the cutter, which will prevent such laceration, and, in this connection, also to provide a ready means of accomplishing such adjustment.

Further objects of my invention are to improve my original machine in various minor particulars, as will hereafter appear.

For an understanding of my invention reference is made to the accompanying drawing, in which,

Figure 1 is an end elevation, and Fig. 2 a front elevation of the main parts of a shoe channeling machine provided with my invention. Figs. 3 and 4 are enlarged detail horizontal, central sectional views of rotary cutters of different forms which I employ. Fig. 5 is a sectional view of a sole which has been operated upon by a cutter of the form shown in Fig. 3. Fig. 6 is a central sectional

view of the cutter and sole shown in Fig. 4 on a plane at right angles to the plane of the section in Fig. 4. Fig. 7 is a top side view of a portion of a sole. Figs. 8, 9 and 10 are detail views of the sole edge guard. Fig. 11 is an enlarged detail sectional view on the line *a—*a** of Fig. 1. Fig. 12 is an enlarged detail end view of the knife block casing. Fig. 13 is a sectional view on the line *b—*b** of Fig. 12. Fig. 14 is a sectional view on the line *c—*c** of Fig. 12. Fig. 15 is a detail view of the channeling knife. Figs. 16 and 17 are detail views of the cap plate of the knife block casing. Fig. 18 is a detail sectional view on the line *d—*d** of Fig. 19. Fig. 19 is a detail end view of the rotary cutter. Fig. 20 is a view illustrating the operation of channeling about the toe.

In the drawing, 1 indicates the frame of the machine, said frame being provided with a bracket arm 2 in which a circular work supporting table 3 is mounted to rotate about a nearly vertical axis, said table being provided with a bevel gear 4 at its under side which is in mesh with the bevel gear 5 mounted on the end of a shaft 6, journaled in the frame and adapted to be turned by the crank 7. A feed wheel 8 is mounted on the end of the shaft 9 directly over the table 3, adjacent the edge thereof, said shaft 9 being mounted in the pivoted frame section 10, and arranged so that the axes of the table 3 and wheel 8 are in the same vertical plane, as in prior devices of this character, a gear 11 on shaft 6 being arranged in engagement with a gear 90 on shaft 9, so that said table and wheel may be rotated in unison.

A rotary cutter or knife 12 is threaded on the end of a shaft 13, which is journaled in a support 14, said shaft 13 being driven from the main shaft 15 by means of a pulley 16, mounted on said shaft 15, belt 17, which passes about pulley 16 and a pulley 18, the latter being mounted on a shaft 19, and carrying a pulley 20 which is connected to pulley 21 on the cutter shaft 13 by a belt 22.

The form of cutter which I find to be best adapted for the purpose consists of an annular head or shank, into which the end of the cutter shaft is threaded, and from the end of which two blades 12' project, as best shown in Fig. 19, said blades being extended longitudinally of the shaft, either parallel or at different angles thereto, according to the form of shoulder or upper receiving seat



which is to be formed on the edge of the sole. For example, if it is desired to produce a shoe having a thick edge, the blades are made to extend divergently from the shank 12, as shown in Figs. 3, 18 and 19, in which case the edge of the sole would be shaped as shown in Fig. 5, or, when a thin edged sole is desired, the blades are made to converge from the shank, as shown in Figs. 4 and 6. Obviously various intermediate forms of cutters are employed according to requirements, but the important feature of all of these forms is that the cutting edge of each blade is so disposed with relation to an axial plane of the cutter, intersecting the edge adjacent the cutter shank, that the portion of the blade beyond such point of intersection does not extend through said plane, but preferably extends obliquely therefrom, as shown, so that the edge advances towards said plane as the cutter is rotated.

A collar 23 is rotatably mounted upon a projecting sleeve 24 between the cutter shank 12 and the frame and concentrically with the cutter shaft 13, said collar being provided with shoulders 24' which are adapted to engage a pin 25 fixed in the frame, as indicated in Fig. 19, to limit the extent of rotation thereof upon the sleeve. A concave or segmental shaped shield 26 projects from the collar 24 longitudinally of shaft 13, to the ends of the cutter blades 12, and is provided at its end with a sole engaging foot 27 which is integral therewith and extends transversely and downward therefrom in position to be pressed against the surface of the sole closely adjacent the path of the cutting edges of the cutter blades. The lower end of the foot 27 is rounded, see Fig. 19, to permit ready insertion of the sole between the same and the table 3, and its sole engaging face is adapted to be held in yielding engagement with the sole which is connected to said collar 24 and the frame, as shown in Figs. 2 and 19.

An edge guide 30 is mounted on an arm 31, said arm being in turn mounted on a slide 32, said slide being arranged in guideways on the frame, see Fig. 1, so as to carry the guard toward and from the table 3. The sole-edge-engaging portion 30' of the guide extends over the surface of the table 3 and is concaved on its upper side corresponding to the path of the cutter blades, to permit it to be extended beneath said blades as close to the path thereof as practicable. One end of a bell crank lever 23 engages slide 32 and a rod 34 is pivotally connected to the other end thereof. A spring 35 on the rod acts between a collar 36 on the rod and a lug 37 on the frame, through which said rod passes loosely, and a nut 38 threaded on the rod limits the extent which said spring 35 can press the edge guide towards the feed wheel 8. The rod 34 is adapted to be drawn down

by a treadle, not shown, to vary the distance which the channel is cut from the edge.

A support 40 is mounted in the frame section 10, and a sleeve 41 is rotatably and slidably mounted in said support. A shaft 43 is rotatably mounted in the sleeve 41, said shaft being provided with means for holding it from longitudinal movement comprising a flange 44 thereon, which is held between the support 40 and a ring 45 secured to said support. A pulley 46 is mounted on the shaft 43 and is adapted to be driven by a belt 47 which passes thereabout over the idle pulleys 48 from the pulley 16. The opposite end of the shaft 43 from the pulley 46 is provided with an eccentric pin 49 which is rotatable and slidable in a rectangular block 50. A knife block 51, is provided with four parallel guiding arms 52, 53, 54, and 55, which are slidably mounted on opposite sides of a pair of lugs 56, 57, integral with the sleeve 41. Said sleeve 41 is also provided with extending casing portions 58 and 59 to provide guiding means for the opposite sides of the knife block arms, an adjustable wear plate 60 being provided between said casing portion 58 and arms 53, 54. The middle portion of the block is transversely slotted to provide ways 51', between which said block 50 is slidably mounted, so that, when said shaft 43 is rotated, said block 51 will be reciprocated on its said guideways. A cover plate 61 is secured against the lugs 56, 57 and the edges of casing portions 58 and 59 to close the casing and to serve as a side guide for the knife block. A knife 62 is clamped against one side of the block 51 by means of a clamping plate 63, said knife being held parallel with the guideways of the block 51 and having a cutting edge 62' on one side which extends from the lower end thereof a distance as great as the length of the channel to be cut thereby. The knife is provided with a narrow, chisel-shaped end and the back thereof is somewhat tapered and rounded so that there are no sharp corners or edges thereon.

A bolt 64 is arranged in support 40, transversely of the sleeve 41, and is provided with a recess 64' in one side thereof, through which said sleeve is adapted to be passed. A nut 65 on said bolt is adapted to draw it so that one side of its recess 64' will be forced into clamping engagement with said sleeve to lock the same rigidly in any longitudinal position, with certain limits, to which it may be adjusted. With this construction, it will be apparent that the inclination and transverse position of the knife may be varied without withdrawing the eccentric pin 49 from the block 50, the shaft 43 being unaffected by said adjustment.

In operation the sole to be channeled is fed from front to rear and the cutter is rotated so that its blades move toward the



front while in engagement therewith, that is, the sole is fed against the rotation of the cutter, it being impractical to feed the sole with the rotation thereof. The cutter is also  
 5 rotated about an axis approximately parallel to the surface of the sole as it rests on the table 3, and perpendicular to the direction in which the sole is fed at the point of engagement. As previously stated, the cutting  
 10 edges of the blade extend obliquely rearward from the shank, and therefore obliquely rearward with relation to the edge of the sole at the point engaged, so that, in forming the shoulder, or upper receiving seat  
 15 on the sole, the leather at the edge is cut away in advance of the portion more remote from the edge. As the ends of the blades are behind the base ends thereof, as they advance, the tendency is to beat or force the leather  
 20 in from the sole edge as it is cut, thus leaving the corner at its edge sharp and smooth. The leather in front of the blade is also thus enabled to act as a support to hold the chips until they are completely severed. If the  
 25 end portions of the blades were arranged in advance of the shank portion, then the tendency would be to force the leather toward the edge as it is removed, and this would also be the case if the cutter were rotated about  
 30 an approximately vertical axis, so that, in either instance, the chips at the edge would not be completely removed, but would be left hanging over the sole edge, such results being highly unsatisfactory.

35 To assist the cutter in completely removing the chips, and to prevent the blades thereof from lifting the sole from the table, the presser-foot 27 is provided, which is forced into yielding engagement with the  
 40 leather by the spring 28 closely adjacent the point where the blades leave the leather, thereby acting to hold the leather down while the adjacent portion is being severed, and, also, at all times firmly holding the sole  
 45 against the table, thereby counteracting the tendency which the blades have of lifting the sole from the table and thus cutting the shoulder too deep. This foot 27, and the adjacent shield 26 which connects it to the collar 24,  
 50 extend over approximately one-half the cutter and perform the function of a chip guard, said guard having its lower edges held close to the surface of the sole at all times and preventing the chips removed by the cutter  
 55 from being thrown into the face of the operator.

While in channeling a shoe having a broad toe the exact position of the channeling knife with relation to the vertical plane of  
 60 the cutters is of little consequence, provided it lies approximately within said plane, yet in channeling a shoe having a very pointed toe, in which the channel turns at a sharp angle, in order to avoid laceration of the lip or flap,  
 65 it is necessary to have the knife accurately

adjusted with relation to the cutter and also to provide a knife of substantially the form shown, that is, a knife having a smooth rounded back, a narrow point, and its cutting edge at the front. As a result of experiment, I have discovered that in order to form  
 70 the edge shoulder about the toe of a sole which is very pointed, with a minimum laceration of the lip, the back or rounded edge of the knife should lie in the vertical plane of the cutter's axis, so that, as illustrated in the  
 75 diagram of Fig. 20, the rounded back of the knife may serve as a guiding pivot about which the cutter may be swung in shaping the edge about the toe. In other words the back  
 80 of the knife is held approximately at the point which represents the vertex of the angle of the channel, as the sole is swung to shape it about the toe, said back being held against the lip which has been cut just pre-  
 85 vious to turning, and, while it will roll back the lip slightly, it will not lacerate it, the only laceration which will be caused being due to the necessity of running the front edge of the knife slightly beyond the vertex of the chan-  
 90 nel, but as the knife is very narrow, this is inconsequential.

The knife may be adjusted to the precise point desired by simply loosening the bolt 64 and sliding the sleeve 41 forwardly or rear-  
 95 wardly, the block 50 sliding on the crank pin 49 as the sleeve is adjusted, and said bolt acting to lock the sleeve firmly in any position to which it may be adjusted.

In practice the knife 62 is reciprocated at a  
 100 high rate of speed, the reciprocations being very short, so that, aside from the time when the knife is first lowered into the channel, practically all the cutting of the channel is performed by the longitudinal edge 62' of the  
 105 knife. The depth of the channel is determined by the vertical position of the support 40 which is adjustably connected to the frame section 10.

The form of guiding means for the knife  
 110 block is also a feature of importance, as the four guiding arms effectively prevent all transverse vibration of the knife and provide ample opportunity to take up wear. The connection between the block and shaft  
 115 which reciprocates it is compact and especially adapted for use in the particular relation shown.

Having thus described my invention, what I claim as new and desire to secure by  
 120 Letters Patent is:—

1. A machine of the character described comprising a sole support, a knife mounted to rotate on an axis approximately parallel  
 125 to said support, and extending longitudinally of said axis in position to form an upper receiving seat on the upper edge portion of a sole held on said support, said knife having its cutting edge disposed to extend obliquely rearward from its sole-edge-engaging  
 130



portion, so that the leather at the edge of the sole is removed in advance of that more remotely situated from the edge, substantially as described.

5 2. A machine of the character described comprising a sole support and means for moving the sole thereover in a predetermined direction, a shaft rotatable about an axis approximately perpendicular to the direction in which the sole is fed and parallel to the face of said support, a cutter mounted on said shaft having a knife extending longitudinally thereof in position to engage the upper side of the sole, adjacent its edge, 10 when held on said support, means for rotating said shaft so that the knife is advanced in the opposite direction to that in which the sole is fed while in engagement therewith, said knife having its cutting edge extending rearwardly, with relation to its direction of rotation, from its sole-edge-engaging portion, to remove the leather at the edge of the sole in advance of that situated more remotely from its edge, substantially as described. 25

3. A machine of the character described comprising a rotary shaft having a knife mounted thereon with its cutting edge extending longitudinally thereof, means for holding a sole with its upper side approximately parallel to the axis of the knife and for feeding it against the rotation of the knife, a presser-foot having a sole-engaging face extending longitudinally of the knife 35 with its rear edge disposed closely adjacent the path of the edge of the knife, and means for yieldingly pressing said foot against the surface of the sole in advance of the knife, substantially as described.

4. A machine of the character described comprising a rotary shaft having a knife mounted thereon with its cutting edge extending longitudinally thereof, sole supporting and feeding means for holding a sole in position to be engaged at its upper side by the knife and for moving it against the rotation thereof, and a presser foot disposed to bear against the surface of the sole closely adjacent the point at which the knife moves out of engagement with the sole, said foot being circularly movable towards and from the sole and having means for yieldingly pressing it against the sole, substantially as described. 45

5. A machine of the character described comprising a rotary shaft having a knife mounted thereon with its cutting edge extending longitudinally thereof, sole supporting and feeding means for holding a sole in position to be engaged by the knife and moving it against the rotation thereof, a collar mounted at one side of said knife and having a chip guard extending longitudinally thereof in front of its path, and means permitting circular movement of said guard to hold one 55

edge thereof closely adjacent the surface of the sole, substantially as described.

6. A machine of the character described comprising a rotary shaft having a knife mounted thereon with its cutting edge extending longitudinally thereof, sole supporting and feeding means for holding a sole in position to be engaged at its upper side by the knife and moving it against the rotation thereof, a supporting ring mounted to move circularly of said shaft, adjacent said knife, a guard plate extending from said ring longitudinally of the knife and adjacent the path thereof, said plate having a sole engaging portion at one edge thereof and means for circularly moving said ring to press said engaging portion against the sole adjacent the path of the knife, substantially as described. 75

7. A machine of the character described comprising sole feeding and supporting means, a rotary cutter disposed to engage a sole held thereby to form an upper receiving seat thereon, a knife block having a channel cutting knife mounted thereon, a support having guideways on which said block is reciprocally mounted, means for reciprocating said block composed of a rotary shaft disposed at right angles to said guideways and having a longitudinally adjustable eccentric connection with the block, and means permitting adjustment of said support longitudinally of said shaft to adjust said knife transversely with relation to the axis of the cutter, substantially as described. 85

8. A machine of the character described comprising a rotatable shaft, a knife block having a pair of parallel guiding arms at each end, guiding supports between each pair of arms, permitting said block to reciprocate at right angles to said shaft and eccentric connecting devices between said block and said shaft and disposed between said supports, substantially as described. 95

9. A machine of the character described comprising a knife block composed of two pairs of oppositely extending parallel arms and having an intermediate, transversely disposed slot, a rotary shaft having an eccentric portion extending into said slot to engage said block, and guiding supports disposed between each of said pairs of arms and at opposite sides of said slot, substantially as described. 110

10. A machine of the character described comprising a knife block composed of two pairs of oppositely extending parallel arms and having an intermediate, transversely disposed slot, a rotary shaft having an eccentric portion extending into said slot, to engage said block, and a support having guideways for said arms disposed at opposite sides thereof, substantially as described. 120

11. A machine of the character described comprising a sole support, a cutter disposed to rotate about a horizontal axis in position 130



to engage the edge portion of a sole held on said support, a channeling knife having a cutting edge extending from its end, and means for reciprocating said knife in such a position that the back thereof adjacent its end lies in the vertical axial plane of the cutter's axis, substantially as described.

12. A machine of the character described comprising a sole support, a cutter disposed to rotate about a horizontal axis in position to engage the edge portion of a sole held on said support, a channeling knife having a smooth, rounded back and a cutting edge ex-

tending from its end, and means for reciprocating said knife in such a position that the back thereof adjacent its end lies in the vertical axial plane of the cutter's axis, substantially as described.

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

EDWIN A. WEBSTER.

Witnesses:

L. H. HARRIMAN.

H. B. DAVIS.