

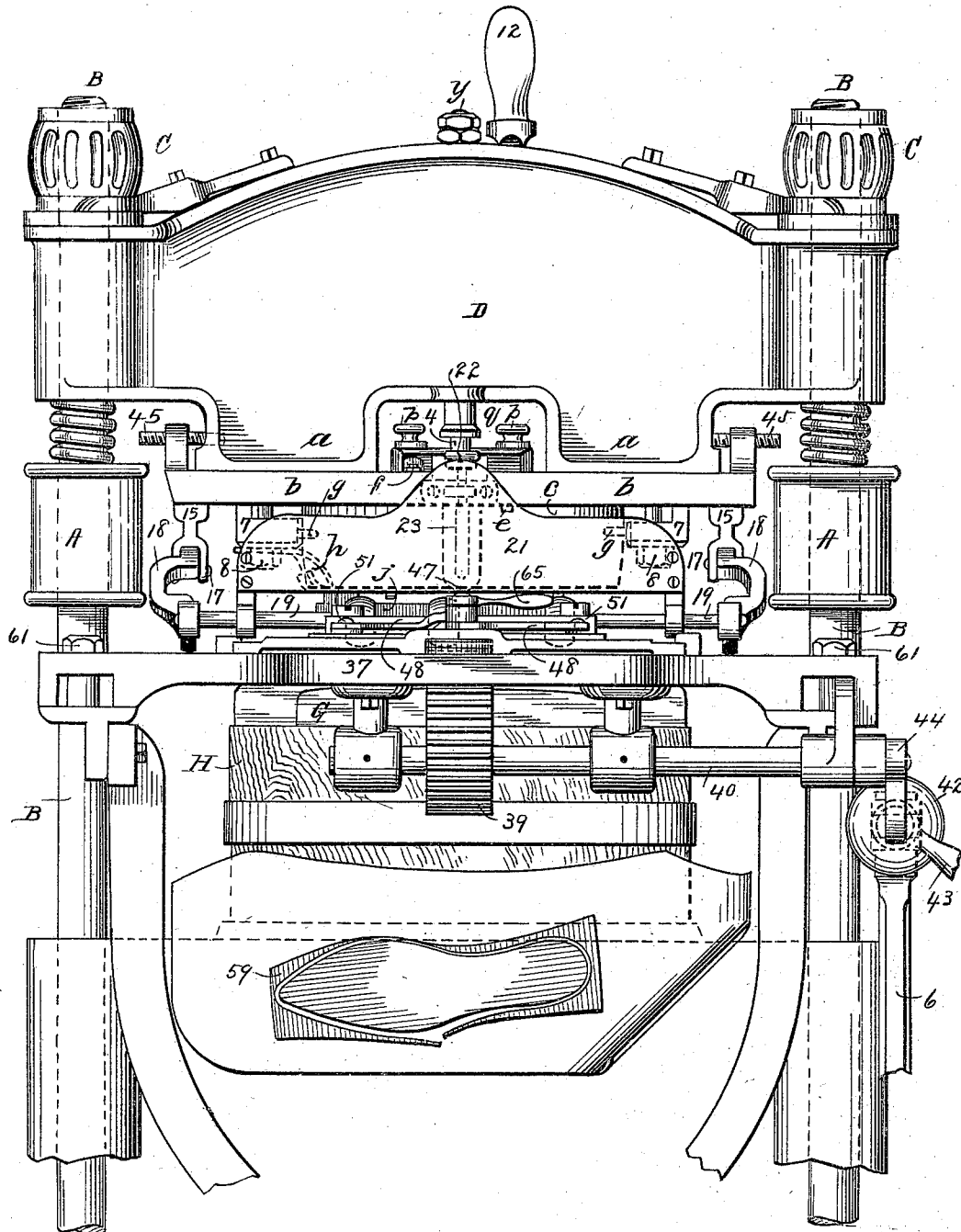
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5 Sheets—Sheet 1.

J. J. HEYS.
SOLE CUTTING MACHINE.

No. 555,864.

Patented Mar. 3, 1896.



Witnesses:
M. C. Bonditch
L. W. Harris

Fig. 1.

Inventor:
John J. Heys
per M. Porter Atty.

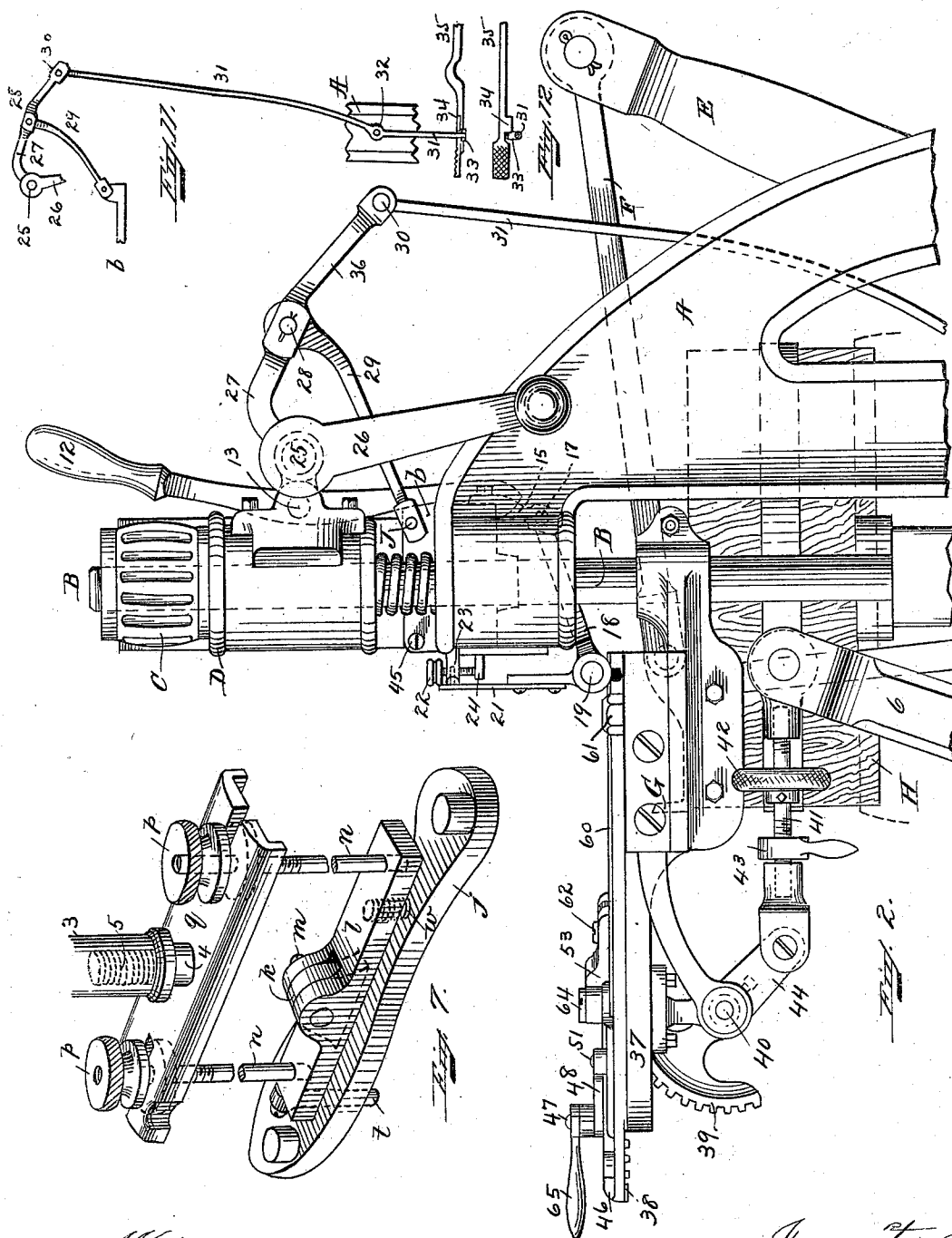
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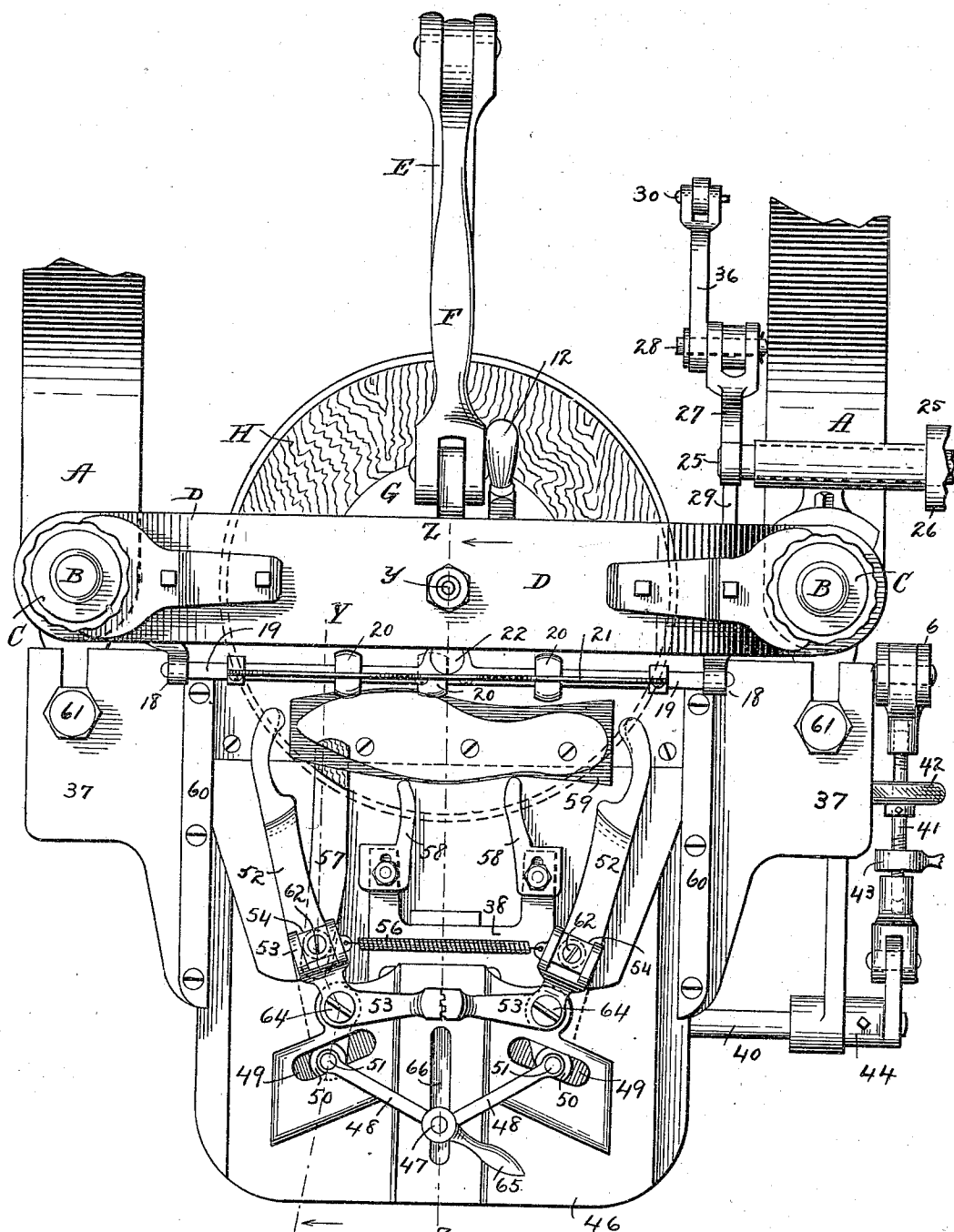
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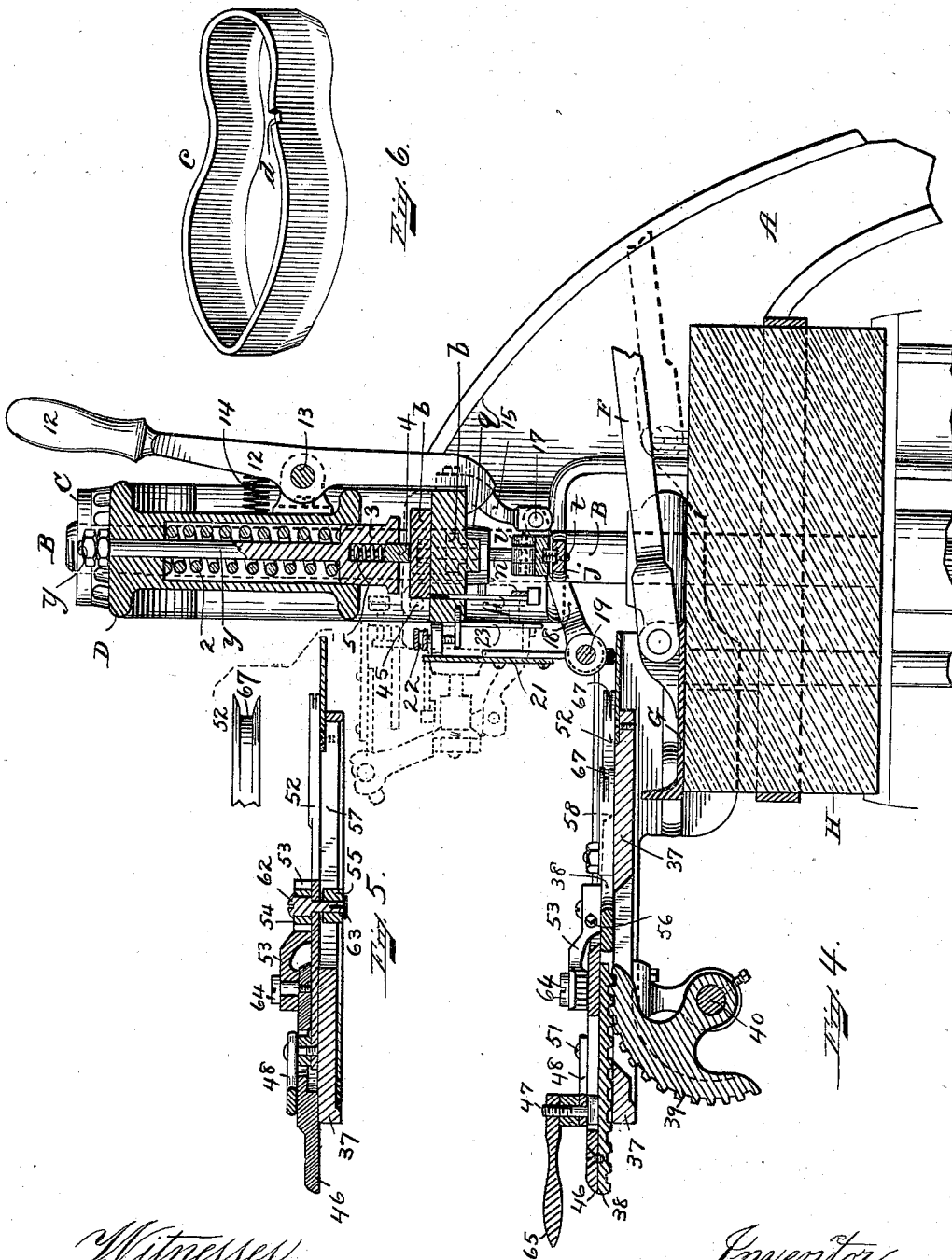
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(No Model.)

5 Sheets—Sheet 5.

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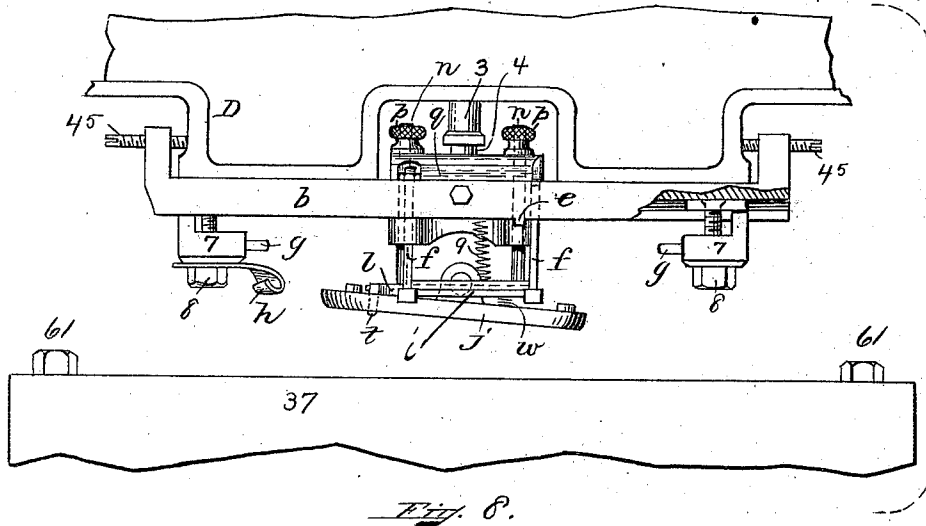


Fig. 8.

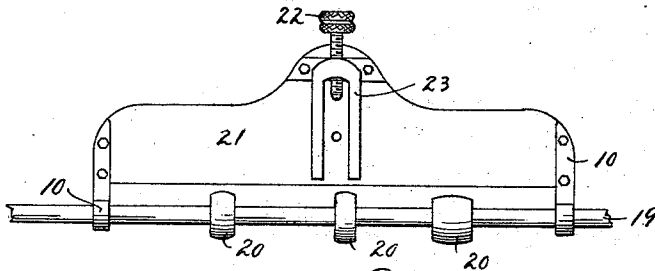


Fig. 9.

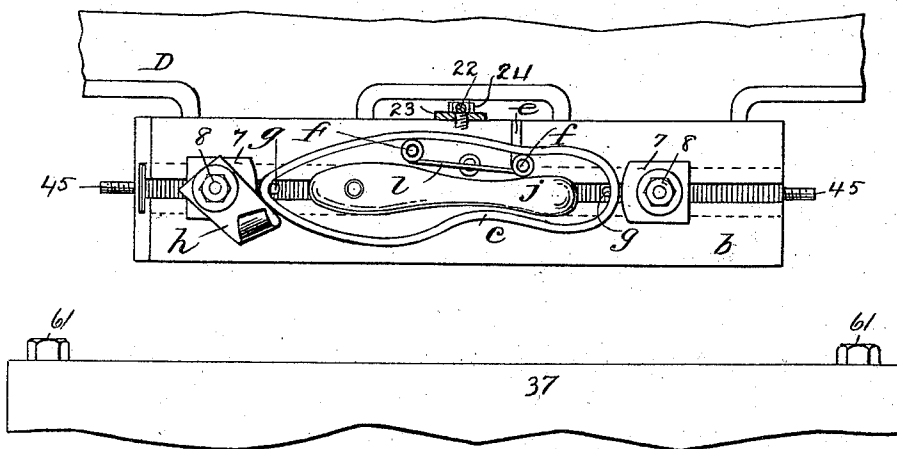


Fig. 10.

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UNITED STATES PATENT OFFICE.

JOHN J. HEYS, OF LYNN, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO
MAURICE V. BRESNEHAN, OF SAME PLACE.

SOLE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 555,864, dated March 3, 1896.

Application filed November 21, 1895. Serial No. 569,723. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. HEYS, of Lynn, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Sole-Cutting Machines, which will, in connection with the accompanying drawings, be hereinafter fully described, and specifically defined in the appended claims.

In said drawings, Figure 1 is a front elevation of so much of my machine as is requisite to show my present improvements and their mode of operation. Fig. 2 is an elevation taken at the right-hand side of Fig. 1. Fig. 3 is a top plan view of Fig. 1. Fig. 4 is a sectional elevation, the section being taken as on line Z Z, Fig. 3, and the view as from the right-hand side of Figs. 1 and 3. Fig. 5 is a detached vertical section taken as on line Y Y, Fig. 3, and viewed as from the right in that figure. Fig. 6 is a detached perspective view of the cutting-die as prepared for use in my improved machine. Fig. 7 is a detached perspective view of the follower and attached parts that coact with the cutting-die. Fig. 8 is a detached elevation of the die-plate, the follower, and coacting parts. Fig. 9 is a rear side elevation of the finger-guard plate, the guide-rod, and attached parts. Fig. 10 is an elevation of the die-plate and die when said plate is turned out to the front as for adjustment of the die. Fig. 11 is a side elevation showing the devices by which the treadle is locked when the die-plate is turned out to the front for adjustment, as in Fig. 10; so that the machine cannot then be started. Fig. 12 is a top plan view of the treadle shown in Fig. 11.

The object of my invention is to furnish divers additions to and improvements upon the sole-cutting machine patented to me by United States Letters Patent No. 521,793, dated June 26, 1894; and the invention consists in the various improvements and the combinations thereof that will be next herein described and then pointed out in the claims.

Referring again to said drawings, A A represent the side frames of the machine, which are substantially the same as shown in my said former patent.

B B are reinforcing-rods inserted in the

front portion of frames A, extended above said frames and supporting the top cross-girt D, held in place by nuts C threaded on said rods in a well-known manner.

A rotary cutting-block H is mounted in the machine, and it can be both rotated and vertically reciprocated, to come in contact with the cutting-die *c*, either by the means shown in my said former patent or by other means, as desired, the rotation and reciprocation of a cutting-block being both old need be no further alluded to at this stage of the case.

E represents a lever driven as in my said former patent, or by other means, to actuate connector F, which is pivoted to and moves clearer G back and forth on block H for removal of the sole and trimmings therefrom after being cut thereon.

Girt D is formed with two downward projections *a a*, in which are inserted the pins 4 5, which pass through bosses formed upon die-plate *b*, so as to aid in supporting the same, the rear edge of said plate when in position for use being supported by the catch-lever 12, pivoted at 13 upon a bracket secured to girt D, said lever engaging the lower side of *b*, as shown in Fig. 4, and said lever being pressed into engagement with *b* by the spring 14, as shown. A small spindle *y* passes centrally through girt D, and a spring 2 seated in an enlarged chamber in the girt acts expansively upon the enlarged head 3 of said spindle at its lower end, while the lock-nuts secured to the upper end of the spindle limit the downward action of the spring, as in said patent. In said head 3 of said spindle is inserted a small plunger 4 upon which is arranged a spring 5 seated in head 3 to force 4 down constantly upon saddle *g*, as shown in Fig. 7, and for purpose to be explained.

The cutting-die *c* is adjusted and secured to the under side of plate *b* in the following manner: Two small pins *f f*, united by bar *z*, are inserted in holes in plate *b* so as to be forced in and drawn out by slight pressure, and when latch-lever 12 is released from plate *b* the latter is swung forward on pins 4 5 so that pins *f* extend horizontally to the front and the straighter or outer side of die *c* is then placed upon them, as shown in Fig. 10, and the notch or recess *d* in the top edge of the

die being seated upon rib *e*, formed upon plate *b*, the die is then locked to plate *b* by pins *g* that extend from brackets 7, secured by screws 8 to plate *b*. It is thus shown that die *c* is
 5 always secured to plate *b* in exactly the same position in relation to its side and end cutting-edges, as the pins *f* and rib *e* constitute three bearings, said pins governing the side-
 10 wise position of the die, while rib *e* entering notch *d* governs its lengthwise position, and hence the pins *g* should fit loosely in the die, their only office being to force it against plate *b*. More than this, by properly positioning pins *f*, as shown, at the proper distance from
 15 the toe and heel part of die *c* all sizes of dies can be by the same means adjusted upon the same pins *f* without change of position of said pins or notch *d* and rib *e*. A spring (shown at 9, Fig. 8) bears at top against die-
 20 plate *b* and its lower end bears against bar *i* that unites pins *f*, and serves to force said pins outward, as shown in Fig. 8, when die *c* is removed. Two rods *nn* pass loosely through plate *b* and have nuts *p p* threaded upon
 25 their upper ends, said nuts being interlocked in saddle *q* seated upon die-plate *b*. Said rods at their lower ends are secured in plate *l*, which at or near its lineal center is formed with ears through which pin *m* passes, and a
 30 follower *j* arranged in die *c* and below plate *l* is by its ear *k* loosely held upon said pin *m*. A pin *t* secured in the end of plate *l* passes loosely through follower *j*, so that when the latter is level said pin does not project from
 35 it, and a coiled spring *w* interposed between *l* and *j* on the opposite side of pin *m* tends to force *j* downward and so cause pin *t* to project below follower *j*, the object being that said pin will force the cut sole away
 40 from follower *j* and so cause it to fall away from said follower in case it should stick thereto.

Another important advantage of the pivoted follower *j* consists in the fact that when
 45 so arranged to rock upon pin *m* in all directions it will always bear equally upon all parts of the sole that is being cut, and hence if, as often occurs, the sole is thicker at one end or side than the other the follower will
 50 bear with equal force upon all parts of it, which is of great importance in frictioning the sole when feeding it beneath the cutting-die.

Saddle *q* is constantly pressed down upon
 55 plate *b* by a small plunger 4 in the enlarged end of spindle *y* by spring 5 arranged above it, as shown in Fig. 4, and when the cutting-block is forced upward till saddle *q* bears against spindle *y* then the force of spring 2
 60 will resist the further upward movement of the moving parts, and it will force the sole out of die *c* when block II descends.

The object of plunger 4, actuated by spring 5, is to hold the sole by friction upon block
 65 II while being fed beneath follower *j* upon said block, and it prevents the movement of the sole beyond the distance required by the

fingers 58, against which it bears, the force of spring 5 being exerted upon buffers 20, secured upon rod 19, which buffers bear directly
 70 upon the sole when it is being fed beneath the die.

Brackets 15 are secured to plate *b*, as shown in Fig. 4, and the guide-rod 19 is carried by curved links 18, connected with said brackets
 75 15 and said plate, (see Figs. 1 and 4,) and on said rods 19 are arranged the cushions 20, which prevent the operator from inserting his fingers beneath said rod so as to be between the cutting-die *c* and the cutting-block II
 80 when the machine is in operation. A guard-plate 21 is secured at its lower edge to guide-rod 19 by the short fingers 10, while at its upper edge a U-shaped piece 23 is united to it and has a screw 22 threaded in it at top, as
 85 shown in Fig. 9. The arms of said piece 23 stand away from plate 21 and pass upon each side of bolt 24 and are held by the head of said bolt, as shown in Fig. 10, where said arms are shown in section, said screw 22 passing
 90 down to and being seated on the head of said bolt 24, as shown in Fig. 4. When it is desired to swing die-plate *b* to the front, as shown by dotted lines in Fig. 4, the handle
 95 of latch-lever 12 is drawn to the front till the catch on the lower end of said lever is released from the die-plate, when by actuating arm 26, Figs. 2 and 11, rigidly mounted on
 100 shaft 25, a rigid arm 27 will thereby be depressed, and the rod 29, which at one end is pivoted to arm 27 at 28, while its opposite end is pivoted at J to die-plate *b*, will by said
 105 means force said die-plate to swing on its pivots 45 to the front, as shown in Fig. 4; and by the same motion rod 31 that is pivoted at 30 to arm 36, that is pivoted at 28, is swung forward upon its lower pivot 32, thereby causing its rigid lower arm 31 to swing
 110 rearward, thus forcing its hook 33 into contact with catch 34, secured to treadle 35, thereby positively locking the same till the die-plate *b* is returned to position with guard-plate 21 and the guide-rod 19 is in position
 115 to protect the fingers of the operator, and the treadle is unlocked and liberated by the reverse action of the parts with which it is connected, as just explained.

For the purpose of feeding the pieces of leather upon block II to be cut by die *c*, I arrange a table, (shown at 37,) secured in place
 120 by bolts 61, as shown in Figs. 2 and 3.

A toothed rack 38 is arranged to slide on table 37, and it is engaged by the correspondingly-toothed arc of a circle 39, secured upon
 125 shaft 40, that is arranged and secured beneath table 37. Said arc is vibrated back and forth by means of a reciprocating lever 6, that may be driven as in my said former patent, or by any suitable means, and to this lever is pivoted rod 41, that at its respective
 130 ends is right and left hand screw-threaded to fit in hubs that are pivoted to said lever and to arms 44, secured upon shaft 40, a hand-wheel 42 being secured on said shaft-rod for

the purpose of adjusting the length so that the feeding devices driven by shaft 40 can be moved to the exact positions required at each end of their stroke, a lever-nut 43 being arranged to be turned against the socketed end of rod 41 to lock the rod when properly adjusted. A feed-slide 46 is secured upon and carried by rack 38, and at its outer end a bolt 47 is interlocked in said slide, and upon said bolt are secured by lever-nut 65 the converging ends of connectors 48, the outer ends of which are engaged by pivots 51, which are seated in bushing 50 of fingers 52, arranged in oblique slots 49. (Shown in Fig. 3.) Said fingers 52 are thus at their rear ends pivoted to connectors 48, and they are also pivoted to block 55, that moves in slot 56 of table 37 by screws 62, that pass through blocks 54, seated in the outer arm of angle-levers 53.

Two angle-levers 53 are pivoted at 64 to feed-slide 46, and their longer arms are toothed and interlock, as shown in Fig. 3, while their outer arms embrace blocks 54 and are by screws 62 attached to fingers 52. A coiled spring 56, having its ends attached to the outer arms of levers 53, tends constantly to draw said arms and fingers 52 inward, and hence, with slot 49, formed in table 37 to guide the left-hand finger 52, Fig. 3, by means of block 55 sliding therein, both fingers 52 are governed by the curvatures of said slot, and hence both of said fingers approach toward and recede from sole-blank 59 with equal rapidity.

Slot 57 upon its outer side is formed straight, while the inner side curves inward, and hence if sole-blank 59 is of a length to barely be admitted between said fingers then the block 55 will follow the outer line of slot 57, while if said blanks are shorter and require said fingers to move toward each other, in order to grip the end of the blank, said blocks follow the inner line of said slot till the sole is so gripped.

The office of adjustable fingers 58, mounted on feed-plate 46, is to serve as the means for moving blanks 59 into proper position on block H for cutting by the die *c*, the endwise position of said blank being obtained by the action of fingers 52, as already explained.

The gibs 60 are for the purpose of securing feed-slide 46 in place and to yet allow it a free reciprocating back-and-forth motion on table 37.

In practice the sides of the sole-leather are first cut into strips the width of which is practically the length of blank 59, then said strips are cut into pieces or blanks, as shown at 59, and in this form are sold by leather-cutters to makers of shoes who then moisten the blanks and then pass them back and forth through a rolling-machine to consolidate the leather; and in this operation some are stretched more and some less, so that in the same bundle, of one size, there will be a variation of half an inch in length in some of the soles, and there will be a corresponding difference in the width

of the soles from the same cause, and in order to utilize all that is possible of the larger soles the smaller ones must be cut as close as possible—hence the object obtained in having studs *f* arranged on the outer or straight side of the die *c* and at a limited distance on each side of the widest part of the sole respectively, for positioning the die, and then arranging fingers 58 in a corresponding position to govern the sole when adjusting it on block H preparatory to being cut as shown in Fig. 3; and for the same reason it is requisite that fingers 52 have a self-adjustability in order to accommodate themselves to the varying length of soles which they are to grasp and hold while being moved beneath the die.

The ends of fingers 52 and 58 are formed with a groove or recess 67 in which the ends of blank 59 are received and held when said fingers move against it.

It will be observed that slots 49 are formed oblique to each other, their inner ends being farther to the rear than their outer ends, so that when the free or inner ends of fingers 52 move toward blank 59 they will by the same act move bodily to the front and when they move outward they will move bodily to the rear, and by this means the inner ends of the fingers will be practically at the center of the width of blank 59 at all times.

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

1. In a sole-cutting machine, the plate *b* provided with means substantially as shown for securing and supporting die *c*, and at its ends pivotally connected with top girt *D*, and at its rear edge secured by lever 12 pivoted to said girt above plate *b* and held in contact with said plate by a spring 14, substantially as specified.

2. In a sole-cutting machine and in combination with a detachably-supported die-plate, the shaft 25, its crank 26, and a rigid arm 27, the rod 29 pivoted to arm 27 at pivot 28 and to the rear part of said die-plate: the rod 36 pivoted to 28 at one end and to lever 31 at its opposite end: said lever pivoted at 32 and having an arm 31 extending downward and arranged to interlock with treadle 39, to hold the same stationary when die-plate *b* is rocked forward by rod 29, substantially as specified.

3. In a sole-cutting machine the follower *j* hinged as at *m*, to plate *l*, a stud *t* secured to said upper plate and extended through said follower, and a spring *w* arranged between said plate and follower to rock the latter upon its pivot for the purpose specified.

4. In a sole-cutting machine the combination of plate *l* arranged to support follower *j* the saddle *q* arranged above the die-plate, nuts *p* of rods *n* interlocked in said saddle, the spring-resisted buffer 4 arranged above the saddle, and the guards 20, mounted on rod 19, to friction the sole, substantially as specified.

5. In a sole-cutting machine the combina-

tion with saddle *q* having nuts *p* of rods *n* interlocked therein, the spindle *y* its plunger 4, spring 5 arranged to act thereon and spring 2 arranged to act on the head of said spindle, 5 substantially as specified.

6. In a sole-cutting machine the combination with cutting-die *c* cutting-block II and table 37 of finger-guard 19 adapted and arranged to remain constantly in front of said 10 die when the machine is operative and to be swung out of place when the die-plate *b* is swung forward, substantially as specified.

7. In a sole-cutter, the combination of brackets 15 secured to die-plate *b*, curved links 18, 15 pivoted to said brackets, a finger-guard 19 supported in the outer ends of said links and the finger-guards 20 mounted on said rod, all substantially as specified.

8. In a sole-cutting machine the combination with cutting-die *c* of studs *f*, *f*, inserted 20 in the support that holds said die and arranged on each side of the lineal center of said die, the one on the toe side, at about one and fifteen-sixteenths of an inch from said center, 25 and the one on the heel side at about one and seven-eighths of an inch from said center, so that dies of varying size and length can be adjusted by said studs, substantially as specified.

9. In a sole-cutting machine and in combination with studs *f*, *f*, arranged to govern the position of die *c* the bar *i* uniting said studs 30 and a spring 9 arranged to bear upon said bar to force said studs outward when the die is removed, substantially as specified. 35

10. In a sole-cutting machine, the combination of cutting-die *c* formed with notch *d*, die-plate *b* provided with rib *e* to enter said notch, the studs *f* to adjust the said die sidewise, and 40 means substantially as described for locking said die to its overhead support, substantially as specified.

11. In a sole-cutting machine the combination with block II and die *c* of guard-plate 21 45 pivoted at its lower edge to rod 19, a U-shaped piece 23 secured to said plate and having a screw-stud 22 threaded therein, a bolt 24 threaded in plate *b* and formed with a head with which part 23 interlocks and on which 50 said screw 22 is seated, all substantially as specified.

12. In a sole-cutting machine the combination of fingers 52 pivoted upon screw 62 secured in block 55 arranged to move in slot 57, 55 and at their rear ends pivoted upon stud 51 secured in the diverging ends of rods 48, which at their converging ends are secured to inter-

locked bolt 47, secured in feed-slide 46, substantially as specified.

13. In a sole-cutting machine, the combination of adjustable fingers 58 and the gaging-studs *f* both said fingers and the studs being correspondingly arranged on the opposite 60 sides of the lineal center of the die as pointed out, with reference to said studs, and so as to automatically govern the position of sole-blanks when being fed forward beneath the cutting-die, substantially as specified. 65

14. In a sole-cutting machine and in combination with fingers 52 pivoted to the studs 70 51 of rods 48, the pivoted screws 62 inserted in block 54, seated in the short arms of levers 53, for the purpose specified.

15. In a sole-cutting machine the combination with fingers 52 pivoted at their outer end 75 upon studs 51, of rods 48 attached to said fingers at their diverging ends, and at their converging ends secured upon interlocking bolt 47 adjustably secured in slot 66 in feed-slide 47, substantially as specified. 80

16. In a sole-cutting machine and in combination with fingers 52 pivoted at their outer ends upon studs 51, the angle-levers 53 pivoted at 64 and having their longer arms with interlocking teeth, and at their shorter arms 85 pivoted to said fingers by pivot 62 seated in block 64, arranged in said levers and secured in block 55 arranged in a slot in table 37 substantially as specified.

17. In a sole-cutting machine the combination of follower *j* and pivot-plate *l*, the follower being hinged to plate *l* so as to adjust 90 its surface to stock of unequal thickness to friction the sole-blank when being fed beneath the cutting-die, substantially as specified. 95

18. The combination of cutting-die *c* and adjusting-studs *f*, the studs being arranged upon the straight or outer side of the die and at distances from the lineal center thereof 100 as specified.

19. In a sole-cutting machine the fingers 52 formed at their inner ends with a groove or recess 67 to receive the end of blank 59, in combination with finger 58 arranged to carry the blank forward into position for cutting, 105 and the feed-slide 46 on which both fingers 52 and 58 are arranged and by the action of which they move inward and outward, substantially as specified.

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Witnesses:

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