

No. 682,803.

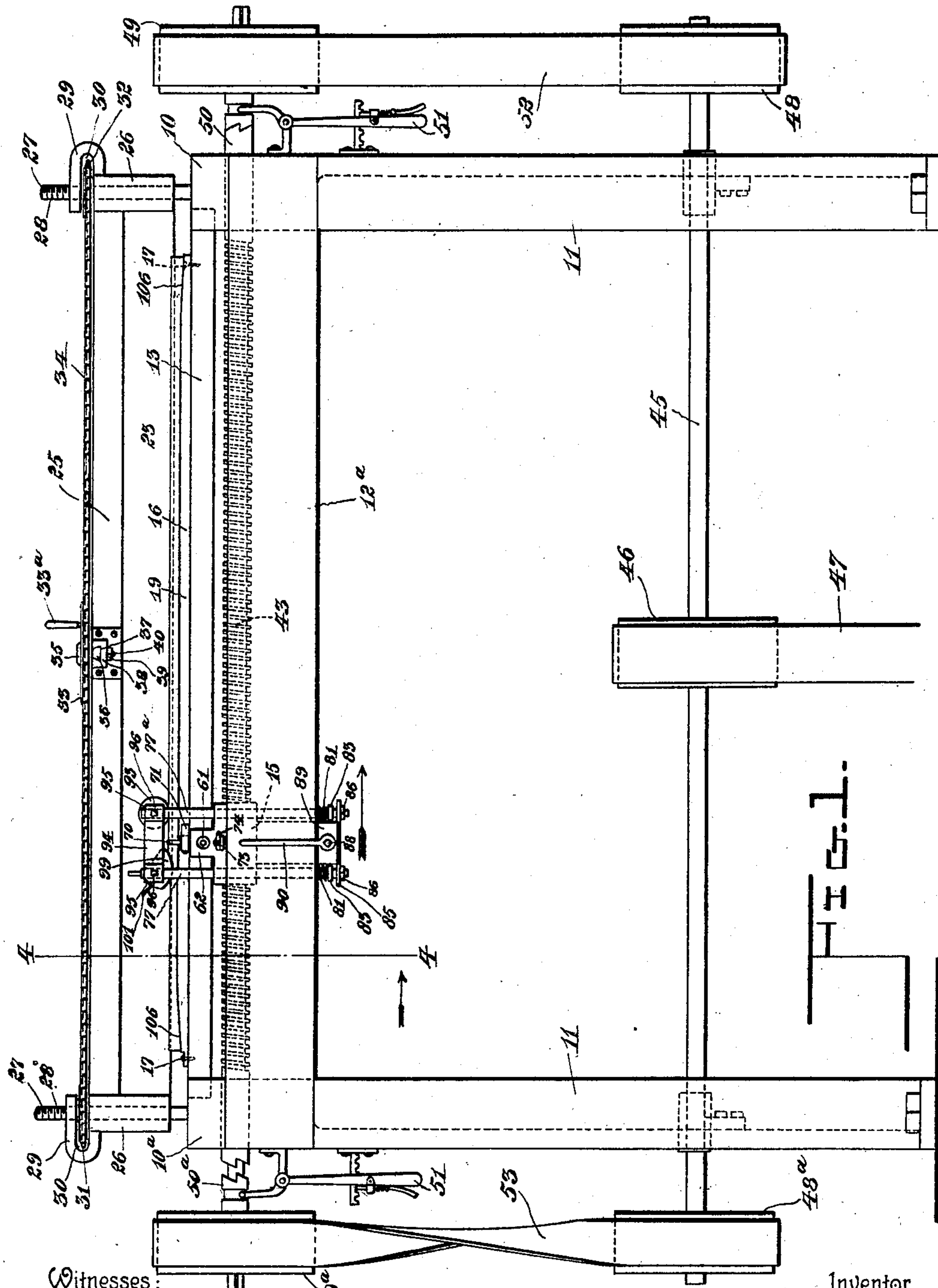
Patented Sept. 17, 1901.

H. B. MALDEIS.
LEATHER WORKING MACHINE.

(Application filed Mar. 22, 1901.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses:

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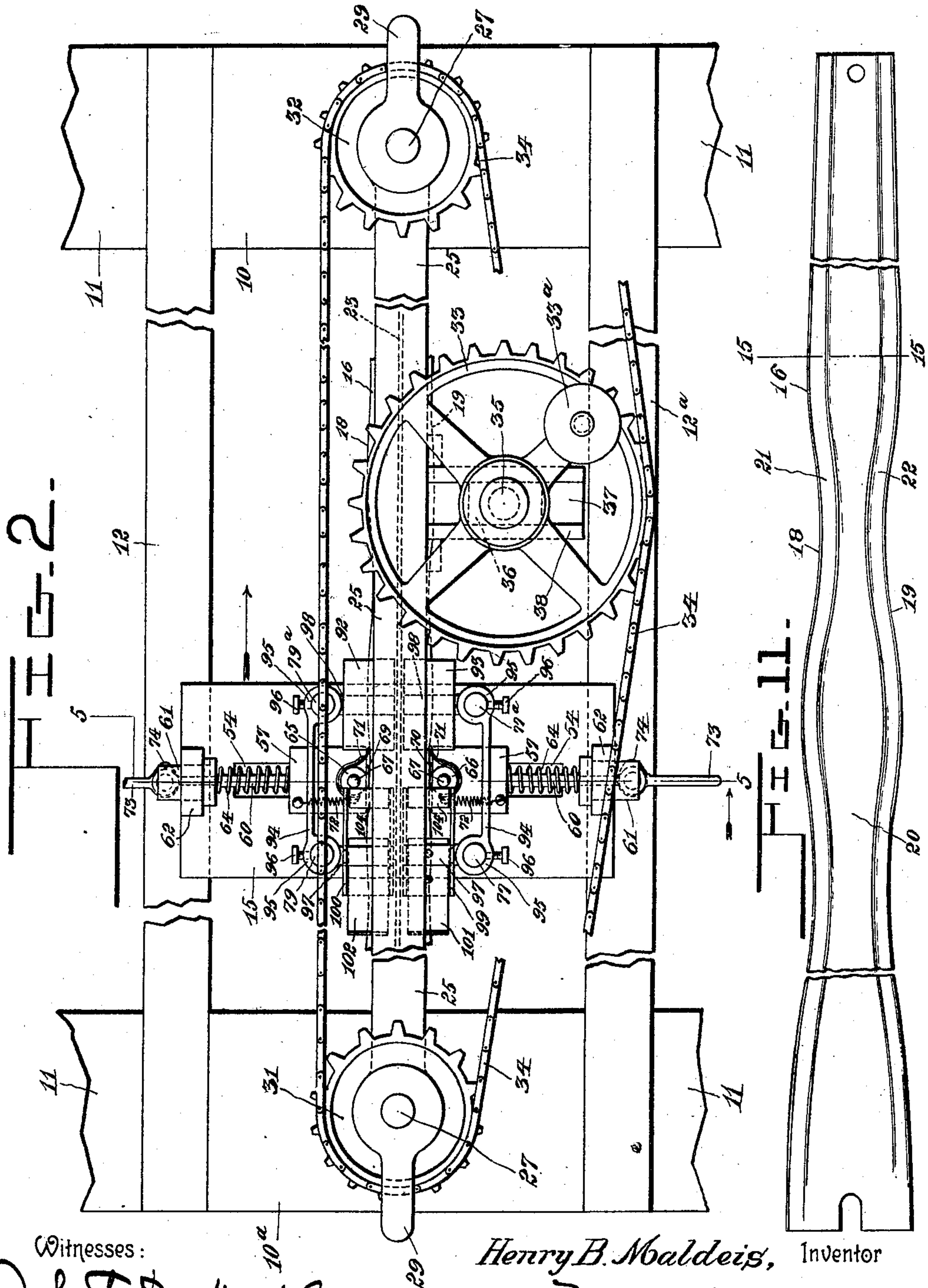
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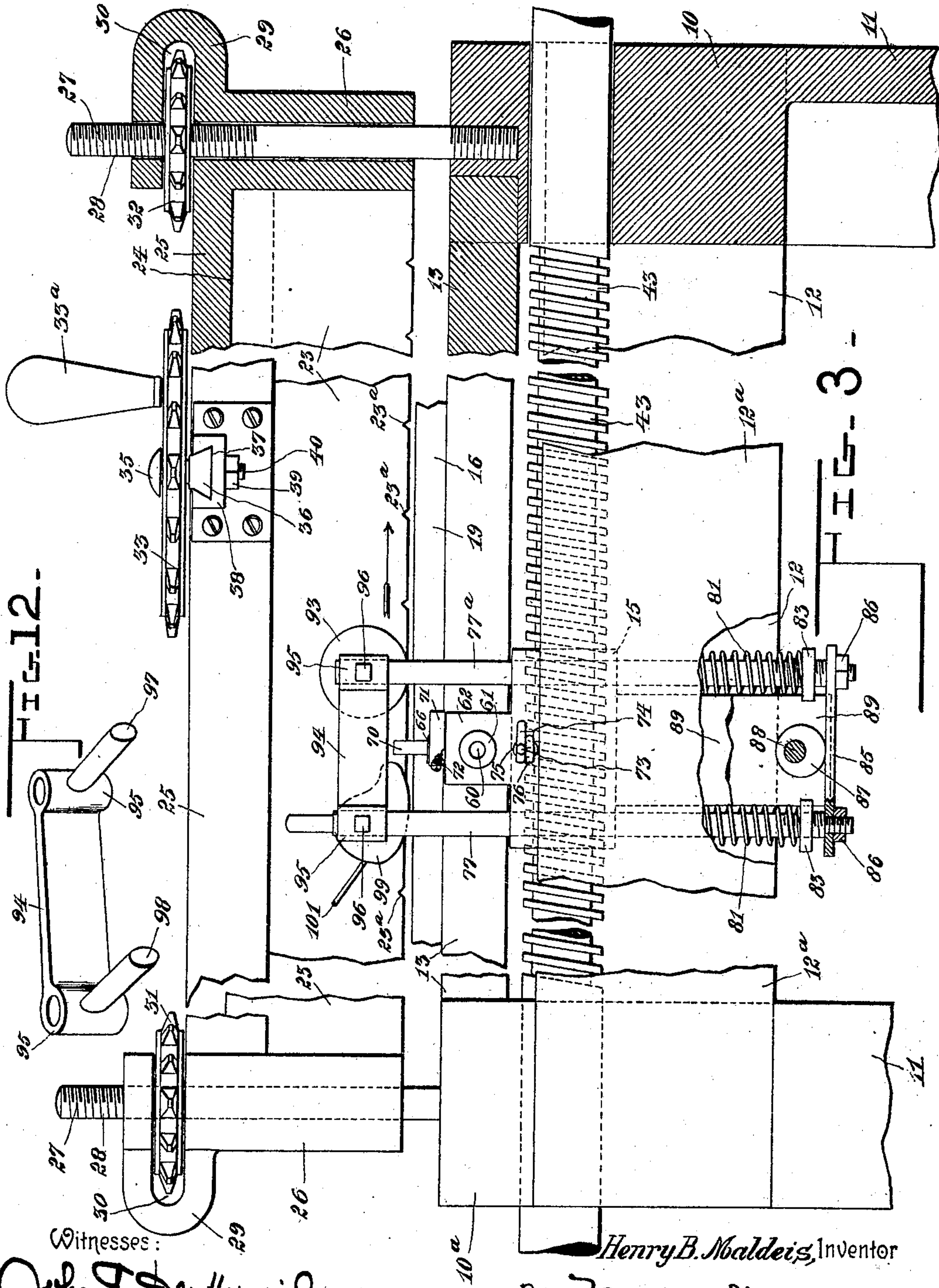
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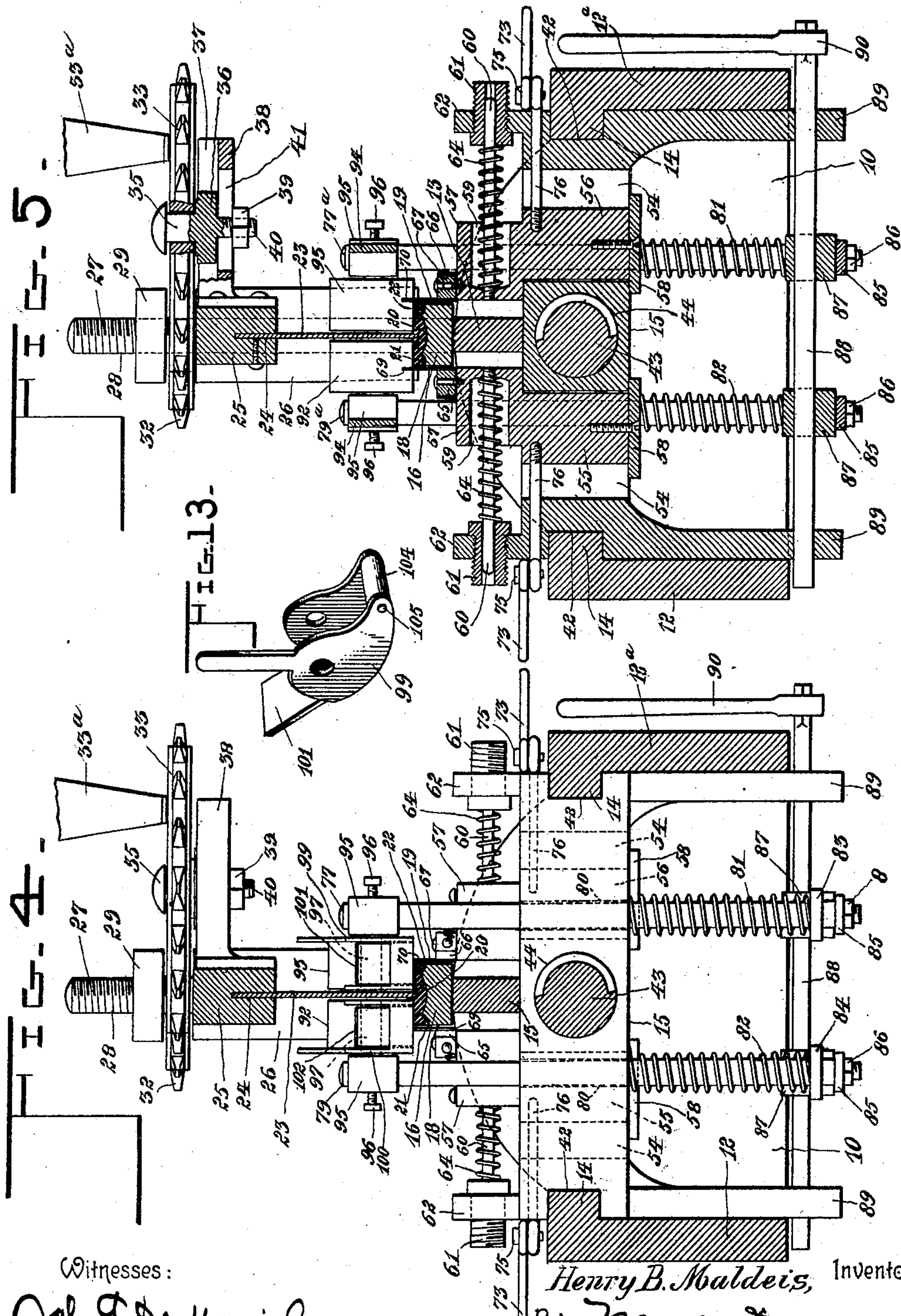
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(No Model.)

5 Sheets—Sheet 4.



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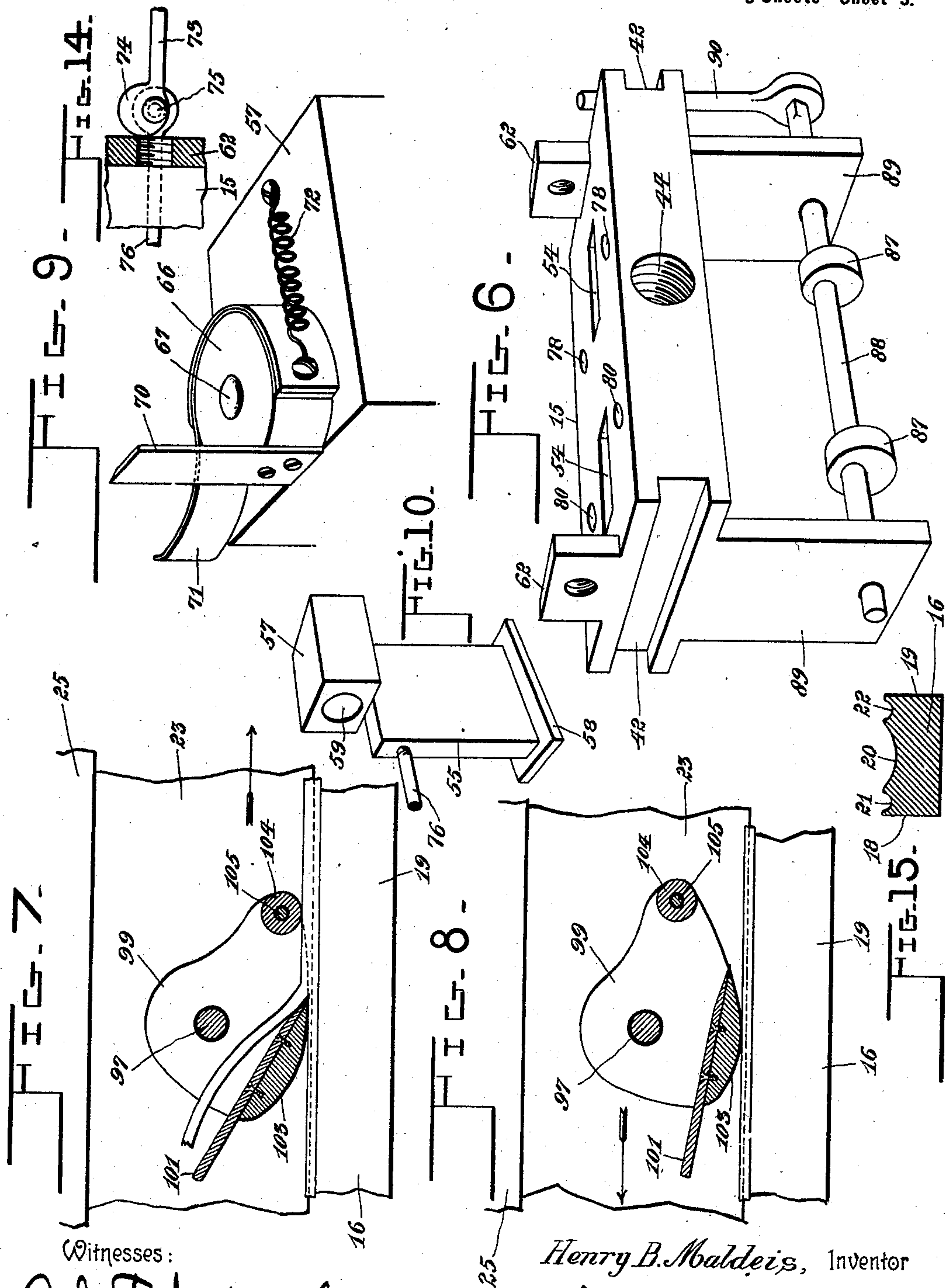
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5 Sheets—Sheet 5.



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UNITED STATES PATENT OFFICE.

HENRY BRUNO MALDEIS, OF MONTREAL, CANADA.

LEATHER-WORKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 682,803, dated September 17, 1901.

Application filed March 22, 1901. Serial No. 52,303. (No model.)

To all whom it may concern:

Be it known that I, HENRY BRUNO MALDEIS, a citizen of the United States of America, residing in the city and district of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Leather-Working Machines; and I do hereby declare that the following is 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.

My invention relates to improvements in leather-working machines; and the primary object in view is to cut, crease, raise, and skive leather all at one and the same operation for the production of leather articles—such as back-straps, breeching or breast-collar layers, and any scalloped or wavy strap that may be desired in harness or for other leather goods.

A further object is to equip the machine with means for firmly clamping the work in place against slipping or displacement during the operation of trimming and skiving the same and at the same time to raise and crease the work, to make the skiving devices serve as work-pressure devices during reversal of the cutter-carriage, to control the cutting or trimming knives, so as to accurately follow the contour of the pattern, and to enable all of the knives and the pressure mechanism to easily be thrown out of operative relation to the combined pattern and mold.

With these ends in view the invention consists in the novel combination of mechanisms and in the construction and arrangement of parts for service, as will be hereinafter fully described and claimed.

In the drawings hereto annexed, forming a part of this specification, Figure 1 is a side elevation of a leather-working machine constructed in accordance with my invention. Fig. 2 is a plan view, on an enlarged scale, with the framework and other parts broken away. Fig. 3 is a side elevation, partly in section, of the machine in its broken-away condition represented by Fig. 2. Fig. 4 is a vertical cross-section in the plane of the dotted line 4 4 on Fig. 1 looking in the direction of the arrow and showing the cutter-carriage and the devices thereon in elevation. Fig. 5 is a vertical cross-section in the plane of the

dotted line 5 5 on Fig. 2 looking in the direction of the arrow and representing the cutter-carriage and its associated parts in section and certain other devices in elevation. Fig. 6 is a detail perspective view of the cutter-carriage removed from the machine. Figs. 7 and 8 are enlarged views, partly in elevation and partly in section, through a knife-carrier and presser for the skiving-knife, Fig. 7 showing the operative position of the knife in skiving the leather and Fig. 8 representing the inoperative position of the knife and the operative relation of the knife-carrier to the work to serve as a presser therefor. Fig. 9 is a detail perspective view of one cutting or trimming knife and the parts associated therewith. Fig. 10 is a detail perspective view of the knife-block adapted to carry the devices shown by Fig. 9. Fig. 11 is a plan view of the combined pattern and mold. Fig. 12 is a detail perspective view of the coupling-bar adapted to unite one pair of presser-bars and to support a presser-roll and a knife-carrier and presser for one of the skiving-knives. Fig. 13 is a perspective view of the knife-carrier and presser, the same adapted to support the skiving-knife. Fig. 14 is a detail plan view of the means for adjusting one of the cutting-knife blocks. Fig. 15 is a detail cross-section through the pattern-mold on the line 15 15 of Fig. 11.

The same numerals of reference denote like parts in each of the several figures of the drawings.

The general framework of my improved machine consists of the end sections 10 10^a, having the legs 11 and united together by the longitudinal side rails 12 12^a, all of these parts being of any usual or preferred construction.

13 designates a horizontal supporting-bar, which is arranged to extend from end to end of the frame and lies in a central position between the side rails 12 12^a and preferably above the horizontal plane of the guides 14, which are provided for the accommodation of the slidable cutter-carriage 15. The guides 14 are formed, preferably, by ribs produced on the inner opposing faces of the side rails 12 12^a, said ribs extending inwardly toward each other, as more clearly shown by Figs. 4 and 5, and said ribs or guides extend practically the full length of the machine, whereby

the cutter-carriage is adapted to traverse the machine-frame for the full length of the combined pattern and mold 16, the latter being represented in position within the frame by
 5 Figs. 1, 3, 4, and 5 and in detail by Fig. 11. The combined pattern and mold 16 is arranged to rest solidly upon the top edge of the horizontal supporting-bar 13, and said pattern-mold may extend from one end of the frame
 10 to the other, as shown by Fig. 1, or it may be of any appropriate length, according to the character of the article it is to fashion. The end portions of this pattern-mold are fastened to the supporting-bar by screws, as at 17,
 15 thus removably mounting the pattern-mold in a solid substantial way upon a permanent part of the machine. It is preferable to make the supporting-bar 13 of less cross-sectional dimensions than the pattern-mold, as shown
 20 by Figs. 4 and 5. The pattern-mold 16 has three active faces, two of which are formed by the wavy or scalloped edges 18 19, and the remaining active surface is produced by the depressions 20 21 22, which are produced in
 25 the upper surface of said pattern-mold. The wavy faces 18 19 on the edges of the mold may be varied according to the desired configurations of the work, and these edges produce the pattern-surfaces of the element 16.
 30 The depressions 20 21 22 may be arranged so as to make the depression 20 somewhat wider than the other depressions 21 22; but of course the contour of these depressions may be varied within wide limits. A single depression
 35 or any combination of depressions may be produced in the upper surface of the element 16, and this depression or depressions form the matrix or mold surface of said element 16.
 From the foregoing description it will be
 40 understood that I use the expression "pattern-mold" because the element 16 is provided with both pattern and mold surfaces, which, however, are readily distinguishable because they perform separate mechanical
 45 functions in connection with other operating elements of the machine.

In the production of a machine wherein a series of operations are performed simultaneously on a piece of leather one problem is the
 50 provision of means by which the leather may be held firmly in place against any tendency to slip and at the same time be forced into the matrix-surface of the pattern-mold, and, furthermore, exposed to the action of the cutting-knives and the skiving-knives. This
 55 object is accomplished in my machine by the provision of a thin pressure-bar 23, the same being coextensive in length with the pattern-mold or with the machine. This pressure-bar is arranged centrally with relation to the
 60 matrix-surface of the pattern-mold, and said bar is carried by vertically-movable adjusting devices, which are limited to movement in a vertical path and which operate under all
 65 conditions to maintain parallelism between said thin pressure-bar and the pattern-mold. Said pressure-bar is received in the recess 24

of the head 25, the parts being secured firmly together by suitable screws, and this head 25 is furnished at its ends with the vertical
 70 guides 26, the latter being slidably fitted upon the vertical guide-posts 27, which are fastened to the end sections 10 10^a of the machine-frame. As shown by Fig. 3, these posts are
 75 threaded at their lower portions into the end sections of the frame, and the upper portion of each post has an external screw-thread 28. The guides 26 of the head 25 loosely receive
 80 the fixed posts, which give the desired vertical direction to the head, and this head is formed at its end portions with the jaws 29, the same
 extending upwardly from the head and providing recesses or spaces 30, in which recesses are fitted the sprocket-gears 31 32, the same
 85 having screw-threaded openings in their hubs, whereby the sprocket-gears may be screwed upon the threaded lengths 28 of the fixed posts 27, and said sprocket-gears are loosely
 mounted in the jaws of the head.

33 designates a master-sprocket, which is
 90 arranged in the same horizontal plane as the sprocket-nuts 31 32, and this master-sprocket 33 lies, preferably, about midway between the sprocket-nuts. This master-sprocket 33 and
 the sprocket-nuts 31 32 are operatively con-
 95 nected together by an intermediate sprocket-chain 34, which is engaged with the sprocket-nuts and with said master-sprocket for the purpose of transmitting the motion of the lat-
 100 ter to the sprocket-nuts and simultaneously rotate said sprocket-nuts in the required directions for the purpose of raising and lowering the head 25 and the pressure-bar 23. This master-sprocket is idly mounted on a
 105 journal-stud 35, which extends upwardly from a dovetailed slide 36, the latter being received in a corresponding guideway 37, which is provided in the upper face of a
 110 bracket 38, said bracket being firmly and solidly bolted to the head 25 at or about the middle thereof and extending toward the front side of the machine, as more clearly shown
 by Figs. 2, 4, and 5. This dovetailed slide may be adjusted in the bracket so as to shift
 115 the master-sprocket in a direction to serve as a tightener for the endless sprocket-chain 34, and said slide is clamped firmly in place by means of a clamping-nut 39, the same being
 120 screwed upon a threaded depending stud 40 of the slide 36, said stud arranged to travel or move in a slot 41 of the bracket 38, (see Fig. 5,) whereby the nut 39 may be tightened
 against the underside of the bracket, so as to firmly hold the slide and the master-sprocket
 125 in their adjusted positions. The master-sprocket may be provided with a suitable operating-crank 33^a, whereby it may be turned by hand.

The cutter-carriage 15 is provided in its ends with the horizontal grooves 42, which
 130 loosely receive the ribs or ways 14 on the opposite side rails of the framework, said cutter-carriage extending between the rails, and thereby slidably mounted upon the frame-

work, so as to be capable of a traversing movement in a rectilinear path and longitudinally of the machine. This traversing movement of the cutter-carriage is imparted positively thereto by the agency of a worm-shaft 43, the same being arranged in a horizontal position centrally of the frame and extending throughout the full length thereof. The end portions of this shaft are smooth and plain, so that it may be journaled in proper bearings in the end sections of the framework, as indicated by dotted lines in Fig. 1; but the shaft is provided with a continuous thread between its bearings. The cutter-carriage is formed with a female threaded central passage 44, (see Fig. 6,) through which passes the shaft 43, the thread of which engages with the thread of the passage 44, whereby the carriage is operatively connected to the shaft for the former to be positively moved along the guideways by the motion of said shaft. As shown by Figs. 4 and 5, the worm-shaft is in the vertical plane of the pressure-bar 23, and hence occupies a central relation to the cutter-carriage. This shaft may be driven in any suitable direction from a main driving-shaft 45, the latter having a suitable pulley 46, which is driven by a belt 47 from any source of power. As shown, this shaft 45 has the pulleys 48 48^a arranged in alinement with other pulleys 49 49^a, the latter being mounted on the end portions of the worm-shaft 43 and adapted to be individually made fast therewith through the agency of suitable clutches 50 50^a, each clutch being controlled by a lever 51. The pulleys 48 49 are connected by a straight belt 52, while the other pair of pulleys 48^a 49^a are connected by the crossed belt 53. (See Fig. 1.) It is evident that the engagement of the pulley 49 by the clutch 50 with the worm-shaft will operate to drive the latter in one direction, and consequently propel the carriage in one direction along the pattern-mold; but when the pulley 49 is disengaged and the pulley 49^a is made fast by the clutch 50^a with the worm-shaft the latter will be driven by the crossed belt 53 in the opposite direction, so as to propel the cutter-carriage also in an opposite direction.

I will now proceed to describe the cutting or trimming knives, which are controllable by the pattern-faces 18 19 of the pattern-mold and are arranged to cut the edges of the leather on wavy or irregular lines conforming to said pattern-surfaces of the mold.

The slidable carriage 15 is provided on opposite sides of its threaded opening 44 with the vertical slots 54, in which are loosely fitted the knife-blocks 55 56, the same being supported on opposite sides of the supporting-bar 13 and of the pattern-mold, said knife-blocks being capable of a limited slidable movement in the slots 54 of the carriage, whereby said knife-blocks are mounted in the carriage, so as to partake of the traversing movement thereof, and they are adjustable in said slots 54 independently of said move-

ment of the carriage. The knife-blocks are provided at their upper ends with the enlarged heads 57, which heads rest upon the carriage, while to the lower ends of the knife-blocks are secured the removable plates 58, whereby the knife-blocks are removably and slidably confined in said carriage. The knife-blocks are provided with the sockets 59 in the enlarged heads thereof, in which sockets are secured the guide-stems 60, the same being arranged on opposite sides of the bar 13 and extending outwardly therefrom. (See Fig. 5.) These stems are firmly attached to the heads of the knife-blocks, so as to be movable therewith, and the outer ends of the stems are slidably fitted in the tubular guides 61, the same being externally threaded and screwed into threaded openings which are provided in the upstanding lugs 62 on opposite sides of the carriage. The stems 60 support the pressure-springs 64, which are coiled loosely on the stems and are arranged to have their inner ends bear against the heads 57 within the sockets 59 thereof, the other end of said springs 64 being seated against the tubular and adjustable guides 61. The energy of these springs is exerted against the knife-blocks, so as to press the latter normally toward each other and toward the supporting-bar, the tension of each spring being regulatable by rotary adjustment of the guide 61, against which is seated the outer end of said spring.

Upon the heads 57 of the two knife-blocks are loosely mounted the rocking knife-supports 65 66, the same being disposed on opposite sides of the pattern-mold and contiguous to the exposed pattern-surfaces thereof. Each rocking knife-support is preferably embodied in the form of a disk, which is centrally pivoted on a pin 67, which extends upwardly from the knife-block head. (See Fig. 9.) Said support or disk is provided with a flat face, to which is secured one of the upstanding cutting or trimming knives 69 70. The cutting-knife is a long blade sharpened at one edge and at its lower end attached firmly to a rocking support, the axis of which is parallel with that of the pattern-mold, and these cutting-knives are carried by the carriage along and in exceedingly close relation to the pattern-surfaces of the pattern-mold, as represented more clearly by Fig. 1. The cutting-knives are caused to travel in paths corresponding to the pattern-surfaces 18 19 by the action of controllers and springs. Each rocking support has a controller 71 fastened thereto, said controller being in the form of a plate of spring metal, which is bent to partially encircle the disk or support, the free end of said controller being arranged well in advance of the support and adapted to ride against one of the pattern-surfaces. The controller is held yieldably in contact with the pattern-mold by the action of a coiled spring 72, which is secured at one end to the head of one knife, while its other end is fastened to the disk or support for the knife. The

spring normally turns the knife-support in a direction to press the controller against the pattern-mold and to make the active edge of the knife cut through the work which may be exposed beyond the pattern-surface of the pattern-mold, and the controller riding against said pattern-surface automatically imparts the desired rocking movement of the knife-support, so as to make the knife cut leather on lines conforming to the pattern-mold, whereby the wavy appearance may be given to the leather.

The knife-blocks 55, which are held normally in their working positions by the springs 64, may be retracted by means of the levers 73, which are disposed on opposite sides of the machine and are provided with the cam-shaped heads 74. (Indicated partly by dotted lines in Fig. 2.) Said levers are pivotally connected at 75 to the outer ends of the rods 76, the latter being individually secured to the knife-blocks 55 56 and extending slidably through the carriage, whereby the rods are mounted in the carriage, and the levers are arranged for their cam-shaped heads 74 to bear against the ends of the carriage. It is evident that either lever may be shifted so as to draw the knife-block away from the pattern-mold and against the tension of the spring 64.

I will now proceed to describe the means by which the skiving of the leather is effected and vertical pressure is given to the work on the traversing movement of the carriage for the purpose of supplementing the pressure exerted by the pressure-bar 23, whereby the work is forced into the matrix-surface of the pattern-mold for the purpose of making one face of the leather partake of or conform to the matrix-surface.

77 77^a designate one pair of pressure-bars, which are mounted vertically and slidably in suitable openings 78 of the carriage, and thereby disposed on one side of the pattern-mold. 79 79^a designate a like pair of vertical pressure-bars, which are slidably mounted in openings 80 of the carriage, and thereby disposed on the opposite side of said pattern-mold, whereby the two pairs of pressure-bars are mounted individually in the carriage, so as to partake of the traversing movement thereof, and at the same time said bars are capable of independent vertical movement under the action of the springs 81 82. One spring is fitted on each pressure-bar, and the upper end of said spring is seated against the under side of the carriage. The lower ends of the springs 81 on the bars 77 77^a are seated on the nuts 83, which are screwed on the threaded lower ends of said bars, and the springs 82 of the other set of bars 79 79^a are seated on similar nuts 84, the latter being screwed on the lower portions of said pressure-bars, whereby either nut may be adjusted so as to regulate the tension of its corresponding spring. The lower ends of the pairs of pressure-bars are connected by the cross-plates 85, each pair of bars

being connected individually by one of said plates, the same being held in place by the nuts 86. These plates are arranged to engage with the eccentrics 87, which are made fast with the rock-shaft 88, the latter extending between the pair of pressure-bars and arranged below the carriage so as to be journaled in suitable bearings provided in the depending lugs 89 on the slides of the slidable carriage, said rock-shaft being mounted to travel with the carriage and arranged in a horizontal plane below the lower edges of the side rails 12 12^a, whereby the rock-shaft may move with the carriage without obstruction from the framework. This rock-shaft extends across the framework, so as to have one end thereof project beyond one side of said framework, preferably the front thereof, and to said end of the shaft is secured the handle 90. In the normal active position of the parts the springs force the pressure-bars in a downward direction and the cross-plates are kept in engagement with the eccentrics of the rock-shaft. By turning the handle 90 in one direction the shaft is rocked so as to present the eccentrics 87 in positions which will allow the springs to raise the connecting-plates, and this adjustment permits the pressure-bars to release the skiving-knives and the rollers 92 93 from the work on the pattern-mold.

The upper ends of the pairs of pressure-bars are connected individually by the coupling-plates 94, each of which is provided with the sleeves 95 at the ends thereof, the sleeves of one coupling-plate being fitted to the pressure-bars of one pair and held firmly thereon by the clamping-screws 96. The coupling-plate of each pair of pressure-bars is furthermore provided with the journal-studs 97 98, the same being cast as an integral part of the plate and disposed at opposite ends thereof and in positions at right angles to the length of the plate. The coupling-plates of the two pairs of pressure-bars are arranged on opposite sides of the pattern-mold and in positions parallel with the longitudinal axis thereof, whereby the journal-studs are arranged to extend inwardly toward the pattern-mold for the purpose of supporting the pair of pressure-rolls 92 93 and the pair of knife carriers and pressers 99 100. The pressure-roll 93 is loosely mounted on the journal-stud 98 of the coupling-plate for the pair of pressure-bars 77 77^a, while the knife carrier and presser 99 is loosely mounted on the journal-stud 97 of the same coupling-plate, whereby the parts 93 99 are mounted one in rear of the other on the coupling-plate of one pair of bars, so as to be disposed on one side of the thin pressure-bar 23. The other pressure-roll 92 is journaled on the stud 97 of the coupling-plate for the pair of bars 79 79^a, and the knife carrier and presser 100 is pivotally or loosely mounted on the stud 97 of the same coupling-plate, whereby the parts 92 100 are mounted on one pair of pressure-bars, so as

to lie partly over the matrix-surface of the pattern-mold and on the opposite side of the pressure-bar 23 from the first-described elements 93 97. From this description it will be understood that the pressure-rolls 92 93 are operatively presented under yielding pressure to the work on the matrix-surfaces of the pattern-mold, whereby they assist the pressure-bar 23 in forcing the work into said matrix-surface, so as to give the desired contour and finish to one face of the leather strap or work.

The skiving-knives, which serve to reduce the leather to the required thickness in a manner well understood by those skilled in the art, are indicated by the numerals 101 102, the same being mounted in the knife-carriers 99 100, respectively. One of these knife-carriers and the skiving-knife therein is shown in detail by Figs. 7, 8, and 13 of the drawings, said Figs. 7 and 8 representing the operative and inoperative positions of said knife. The knife-carrier is cast in a single piece of metal in hollow form, the same comprising parallel plates and the transverse web, and between these plates is arranged the knife which finds a solid bearing upon the web, to which said knife is secured by screws, all clearly shown by said Figs. 7 and 8. The web of the knife-carrier is provided with a curved surface 103, disposed in eccentric relation to the axis of oscillation of the knife-carrier which is afforded by one of the journal-studs of one coupling-plate, and the sharpened operative end of the skiving-knife is arranged to project beyond the edge of the web and in advance of the eccentric surface 103. Each knife-carrier is fashioned to present a narrow front end and a broad rear end, and on this narrow front end is arranged a roller-shoe 104, the same being idly mounted on a suitable pin 105 and having its surface exposed beyond the knife-carrier, so that it will ride upon the work when said knife-carrier and the skiving-knife are adjusted to their operative positions, as shown by Fig. 7. When the carriage is traversing in the direction indicated by the arrow in Figs. 2, 3, and 7, the knife-carriers 99 100 are arranged to have their front ends lowered, so that the roller-shoes 104 will press upon the work in advance of the skiving-knives, and thereby prevent said knives from penetrating too far into the work. During the travel of the carriage and the knives in this direction said knives penetrate and skive the leather, as represented by Fig. 7; but when the carriage and the mechanisms mounted thereon travel in the opposite direction the knife-carriers 99 100 are automatically thrown by frictional contact with the work into the inoperative position of Fig. 8, whereby the surfaces 103 are brought below the knife-carrier pivots and are made to ride upon the work with considerable force, whereby the surfaces 103 constitute presser devices, so as to assist the rollers 92 93 in making the bottom surface of

the leather conform to the matrix-surface of the pattern-mold. The end portions of the pattern-mold are inclined or beveled, as at 106, thus providing clearance for the knife-carriers and allowing the same to travel with the carriage without acting on the work, whereby said knife-carriers are automatically thrown into and out of position on the starting and stopping of the carriage.

The lower end of the thin longitudinal pressure-bar 23 is provided with a series of notches 23^a, which notches increase the efficiency of the pressure-bar in its engagement with the work.

The operation of my invention may be described as follows: Assuming that the cutter-carriage is at the left-hand end of the machine shown by Fig. 1, that the slidable head 25 and the pressure-bar 23 are raised a suitable distance, that a proper pattern-mold is in operative position on the supporting-bar 13, and that the several cutter and pressure devices are in their retracted positions, the operator proceeds to first adjust the work by placing the same in a smooth condition upon the matrix-surface of the pattern-mold. The master-sprocket 33 is now rotated so as to give proper motion to the sprocket-chain and to the sprocket-nuts for the purpose of lowering the head 25, and thereby making the thin pressure-bar 23 engage centrally with the work and throughout the length of the pattern-mold. The shaft 88 is now rocked so that the springs will depress the pressure-bars, and thereby make the latter present the pressure-rolls 92 93 and the knife carriers and pressers 99 100 in operative position to bear upon the top surface of the work on the pattern-mold. The levers 73 are released for the springs 64 to press the trimming-knives inwardly toward the pattern-mold for the controllers 71 to ride against the pattern-surfaces thereof. All the parts having now been adjusted to their operative positions, the worm-shaft 43 is driven so as to propel the carriage in the direction indicated by the arrows, or from left to right on Figs. 1, 2, 3, and 7 of the drawings. During this movement of the carriage the pressure-rolls 92 93 coact with the pressure-bar 23 and force the work upon the matrix-surface of the pattern-mold. The knife-carriers 99 100 present the two skiving-knives in position for skiving the work and reducing it to the required thickness, and the controllers 71 are held in engagement with the pattern-mold, so as to shift the position of the cutting or trimming knives 69 70 and make them cut the edges of the work on both sides of the pattern-mold and on wavy or other lines corresponding to the contour of the pattern-surfaces. The carriage having traversed the required length of the pattern-mold and the work thereon having been simultaneously cut or trimmed, skived, and pressed, so as to make it present the desired ornamental appearance, the carriage is arrested at or near the right hand

end of the frame, the direction of rotation of the worm-shaft 43 is reversed, and the carriage is positively driven or moved in an opposite or backward direction, as indicated by the arrow in Fig. 8. During this reverse travel of the carriage the knife-carriers 99 100 are reversed to the positions indicated by Fig. 8, wherein the eccentric surfaces 103 are made to ride upon the top surface of the work which was previously skived by the action of the knives, thus making said surfaces of the carriers 99 100 act as pressers to assist the rolls 92 93 and the pressure-bar 23 in forcing the leather upon the matrix-surface of the pattern-mold. Furthermore, during this backward travel of the carriage the cutting or trimming knives 69 70 move idly past the pattern-mold, and the skiving-knives are, as will readily be apparent, thrown to their operative positions. When the carriage completes its backward traverse the operator again turns the master-sprocket 33, but in a direction to elevate the head 25 and the pressure-bar 23, thereby withdrawing the latter from the work and releasing the same, so as to facilitate its removal from the machine, the pressure-rolls 92 93 being also released by proper manipulation of the rock-shaft 88. A new piece of leather is now placed upon the pattern-mold, clamped as before, and the operations are repeated.

Changes within the scope of the appended claims may be made in the form and proportion of some of the parts while their essential features are retained and the spirit of the invention is embodied. Hence I do not desire to be limited to the precise form of all the parts as shown, reserving the right to vary therefrom.

Having thus described my invention, what I claim as new is—

1. In a leather-working machine, the combination of a pattern-mold provided with pattern-surfaces and a matrix-surface, a work-clamp of less width than the matrix-surface of the pattern-mold and disposed in coöperative relation thereto, a traversing cutter-carriage, and cutter devices mounted on said carriage in active relation to the pattern and matrix surfaces of said pattern-mold, substantially as set forth.

2. In a leather-working machine, the combination of a pattern-mold provided with a matrix-surface and with one or more lateral pattern-surfaces, a work-clamp comprising a thin bar arranged longitudinally and centrally with respect to said pattern-mold and in coöperative relation to the matrix-surface thereof, means whereby said work-clamp may be adjusted in parallel relation with respect to said pattern-mold, a cutter-carriage, and cutter devices mounted on said carriage in active relation to said pattern-mold, substantially as set forth.

3. In a leather-working machine, the combination of a pattern-mold provided with a matrix-surface and with pattern-surfaces, a

thin pressure-bar in operative relation to the matrix-surface and disposed longitudinally and centrally with respect to said pattern-mold, means for adjusting said pressure-bar toward or from the pattern-mold, a cutter-carriage, and cutter devices mounted on said carriage in coöperative relation to the pattern-mold, substantially as set forth.

4. In a leather-working machine, the combination of a pattern-mold, a slidable head movable relatively to said mold, a pressure-bar carried by said head and disposed centrally with respect to said pattern-mold, guide-posts on which the head is slidably mounted, an adjusting mechanism having devices engaging with said posts and movable with said head, a cutter-carriage, and cutter devices mounted on the carriage in coöperative relation to the pattern-mold, substantially as set forth.

5. In a leather-working machine, the combination of a pattern-mold, stationary guide-posts, a head slidable on said posts and carrying a pressure-bar which is disposed in coöperative relation to the mold, nuts having threaded engagement with said posts and loosely confined on the head, a driving element operatively connected with said nuts and supported on the head, a cutter-carriage, and cutter devices mounted on the carriage in coöperative relation to the pattern-mold, substantially as set forth.

6. In a leather-working machine, the combination of a screw-shaft, a slidable cutter-carriage engaging with said screw-shaft, a pattern-mold in fixed relation to the cutter-carriage, a work-clamp, cutting-knives mounted on the work-carriage and controllable by the pattern-mold, and skiving-knives also mounted on the work-carriage and arranged to ride upon work confined on said pattern-mold, substantially as set forth.

7. In a leather-working machine, the combination of a pattern-mold provided with a matrix-surface and with pattern-surfaces, a cutter-carriage arranged to traverse the pattern-mold, a work-clamp, cutting-knives mounted on the carriage and controllable by the pattern-surfaces of the pattern-mold, and a skiving-knife movable with the carriage and presented in coöperative relation to the matrix-surface of the mold, substantially as set forth.

8. In a leather-working machine, the combination of a pattern-mold having matrix and pattern surfaces, means for clamping the work upon said matrix-surfaces, a cutter-carriage, skiving-knives mounted on the carriage, pressure devices also mounted on the carriage and arranged to force the work upon the matrix-surface of the pattern-mold, and cutting-knives supported by the carriage and controllable by the pattern-surfaces of said pattern-mold, substantially as set forth.

9. In a leather-working machine, the combination of a pattern-mold, a clamping-bar of less width than the pattern-mold and disposed

in longitudinal coöperative relation thereto, a cutter-carriage, pressure devices supported on the carriage and arranged on opposite sides of the clamping-bar and adapted to traverse work on said pattern-mold, and skiving-knives also mounted on the carriage in coöperative relation to work on the mold, substantially as described.

10. In a leather-working machine, the combination of a pattern-mold, a cutter-carriage, a pressure device supported by the carriage and mounted to traverse the mold, means for yieldably holding said pressure devices in their operative relation to the mold, knife-carriers also yieldably mounted on the carriage and arranged to traverse the mold, and means for presenting the knife-carriers toward the mold, substantially as described.

11. In a leather-working machine, the combination of a pattern-mold, a clamping-bar disposed in coöperative relation to a matrix-surface of said pattern-mold, a cutter-carriage, pressure devices mounted on said carriage and disposed on opposite sides of the clamping-bar, skiving-knives also mounted on the carriage and arranged on opposite sides of the clamping-bar, means whereby said devices are held in operative positions, and means for moving said devices away from the mold, substantially as described.

12. In a leather-working machine, the combination of a pattern-mold, a cutter-carriage, pressure-rolls on said cutter-carriage, pivoted skiving-knives movable with the carriage and operable independently of the pressure-rolls, and means whereby said devices are kept in their operative positions, substantially as described.

13. In a leather-working machine, the combination of a pattern-mold, a thin pressure-bar disposed in coöperative relation to the matrix-surfaces of the pattern-mold, pressure devices mounted on the carriage and disposed on the opposite sides of the pressure-bar and in coöperative relation to the mold, and skiving-knives also mounted on the carriage and on opposite sides of the pressure-bar, substantially as described.

14. In a leather-working machine, the combination of a pattern-mold, a cutter-carriage, a pressure-bar opposite to the pattern-mold, pressure devices yieldably mounted on the carriage and disposed to traverse the mold in close relation to said pressure-bar, and skiving-knives pivotally and yieldably mounted on the carriage and disposed in a like relation to the pattern-mold and to the pressure-bar, substantially as described.

15. In a leather-working machine, the combination of a pattern-mold, a cutter-carriage capable of a traversing movement relative to the pattern-mold, a pivoted knife-carrier disposed on said cutter-carriage in coöperative relation to the pattern-mold and provided with a pressure-surface which is eccentric to the pivot of the knife-carrier, a skiving-knife

supported in the knife-carrier and projecting beyond the eccentric pressure-surface thereof, and means for imparting a traversing movement to the cutter-carriage and the knife-carrier mounted thereon, whereby the skiving-knife is presented in operative position on the movement of the cutter-carriage in one direction and on the opposite movement of the cutter-carriage said knife-carrier is automatically turned on its pivot and its presser-surface is arranged to act upon and to traverse the work, substantially as described.

16. In a leather-working machine, the combination with a mold, and a cutter-carriage, of a rocking knife-carrier pivotally mounted on said carriage to have a free and unrestrained movement thereon, said knife-carrier provided with a curved presser-surface which lies eccentric to the axis of motion of said carrier, and a skiving-knife attached to the carrier and projecting beyond the curved presser-surface thereof, as and for the purposes described.

17. In a leather-working machine, the combination with a pattern-mold, and a traversing carriage, of a rocking knife-carrier pivotally mounted on the carriage and provided with a curved presser-surface arranged eccentric to the axis of vibration of the knife-carrier, said presser-surface being opposite and in coöperative relation to a matrix-surface of the pattern-mold, a roller-shoe mounted on the knife-carrier beyond the front end of the eccentric surface thereof, and a skiving-knife attached to the knife-carrier and exposed between the roller-shoe and the presser-surface, the parts arranged to operate substantially as set forth.

18. In a leather-working machine, the combination with a pattern-mold, and a traversing carriage, of spring-actuated pressure-bars mounted in the carriage, pressure devices mounted on the pressure-bars, and knife-carriers also mounted on the pressure-bars, and means for giving adjustment to said pressure-bars at different points of traverse of said carriage, substantially as described.

19. In a leather-working machine, the combination with a pattern-mold, and a traversing carriage, of pressure-bars mounted in the carriage and connected in pairs, a pressure-roll and a skiving-knife individually mounted on one pair of pressure-bars and disposed in coöperative relation to said pattern-mold, means for yieldably actuating said pressure-bars to hold the pressure-rolls and skiving-knives in operative position, and a rocking shaft mounted on the carriage and having means for moving said pressure-bars, substantially as described.

20. In a leather-working machine, the combination with a pattern-mold, and a cutter-carriage, of slidable knife-blocks confined on the carriage and normally held in close relation to the pattern-mold, and cutting-knives yieldably supported on said knife-blocks and

provided with controllers which are in operative relation to the pattern-surfaces of said pattern-mold, substantially as described.

21. In a leather-working machine, the combination with a traversing carriage, of a pattern-mold having lateral pattern-surfaces, rocking knife-supports mounted on said carriage contiguous to the pattern-surfaces of said pattern-mold, cutting-knives carried by the knife-supports, and controllers engaging with the pattern-surfaces and operatively connected to the rocking knife-supports for automatically controlling the positions of the cutting-knives, substantially as described.

22. In a leather-working machine, the combination of a pattern-mold having lateral pattern-surfaces and a matrix-surface on its upper side, a traversing carriage, knife-supports slidably mounted on said carriage in the horizontal plane of the pattern-mold and having means arranged to ride against the pattern-surfaces thereof, cutting-knives carried by said knife-supports and presented thereby in cooperative relation to the pattern-surfaces of said pattern-mold, a longitudinal clamp cooperating with the matrix-surface of the pattern-mold, and skiving-knives mounted on the cutter-carriage and disposed on opposite sides of the longitudinal clamp, substantially as and for the purposes set forth.

23. In a leather-working machine, the combination of a pattern-mold having lateral pattern-surfaces, a traversing carriage, knife-supports pivotally mounted on the carriage and provided with upstanding knives which are disposed on opposite sides of the pattern-mold and close to the pattern-surfaces thereof, controllers projecting from the knife-supports and arranged to ride against the pattern-surfaces, and retractors for holding the knife-supports and controllers in their operative positions, substantially as described.

24. In a leather-working machine, the combination of a pattern-mold having lateral pattern-surfaces, a traversing carriage, knife-blocks slidably fitted in the carriage, cutting-knives mounted on said knife-blocks and having means controllable by the pattern-surfaces, and means for presenting said knife-blocks in their operative positions, substantially as described.

25. In a leather-working machine, the combination of a pattern-mold, a traversing carriage, knife-blocks slidably fitted in the carriage, springs for impelling said knife-blocks toward the pattern-mold, means for individually retracting the knife-blocks against the pressure of their springs, and cutting-knives supported on the knife-blocks and having means controllable by the pattern-surfaces of said pattern-mold, substantially as described.

26. In a leather-working machine, the combination of a pattern-mold provided with matrix and pattern surfaces and having beveled ends, a thin pressure-bar disposed in cooperative relation to the matrix-surface, a cutter-carriage, pressure-rolls yieldably mounted on the cutter-carriage and disposed on opposite sides of the pressure-bar and in cooperative relation to the matrix-surface, skiving-knives pivotally supported on said carriage and also disposed on opposite sides of the pressure-bar and in cooperative relation to the matrix-surface, and trimming-knives yieldably mounted on the carriage and having means arranged to ride against the pattern-surfaces of said pattern-mold, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

HENRY BRUNO MALDEIS.

Witnesses:

H. T. BERNHARD,

T. MYNARD.