

No. 843,899.

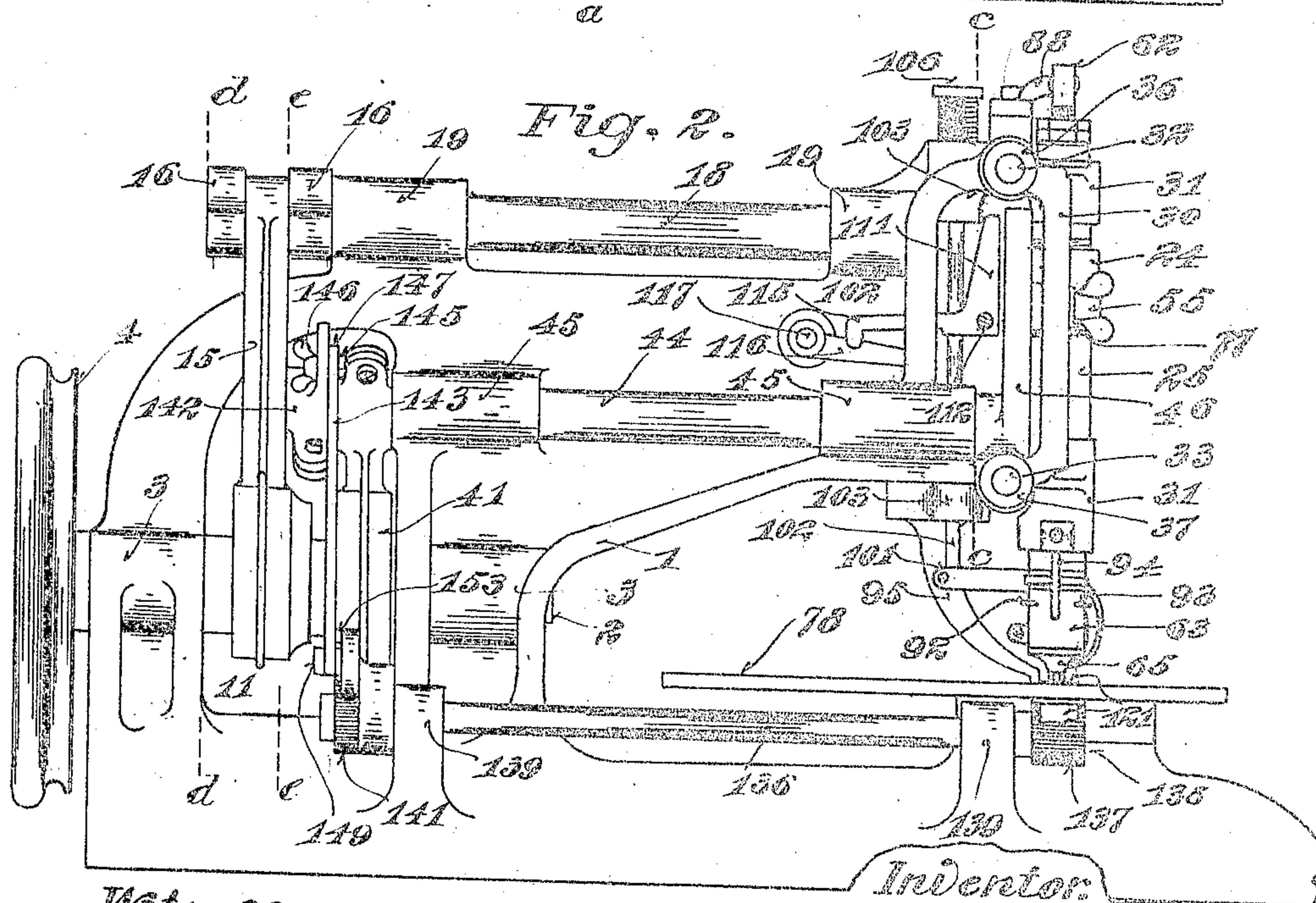
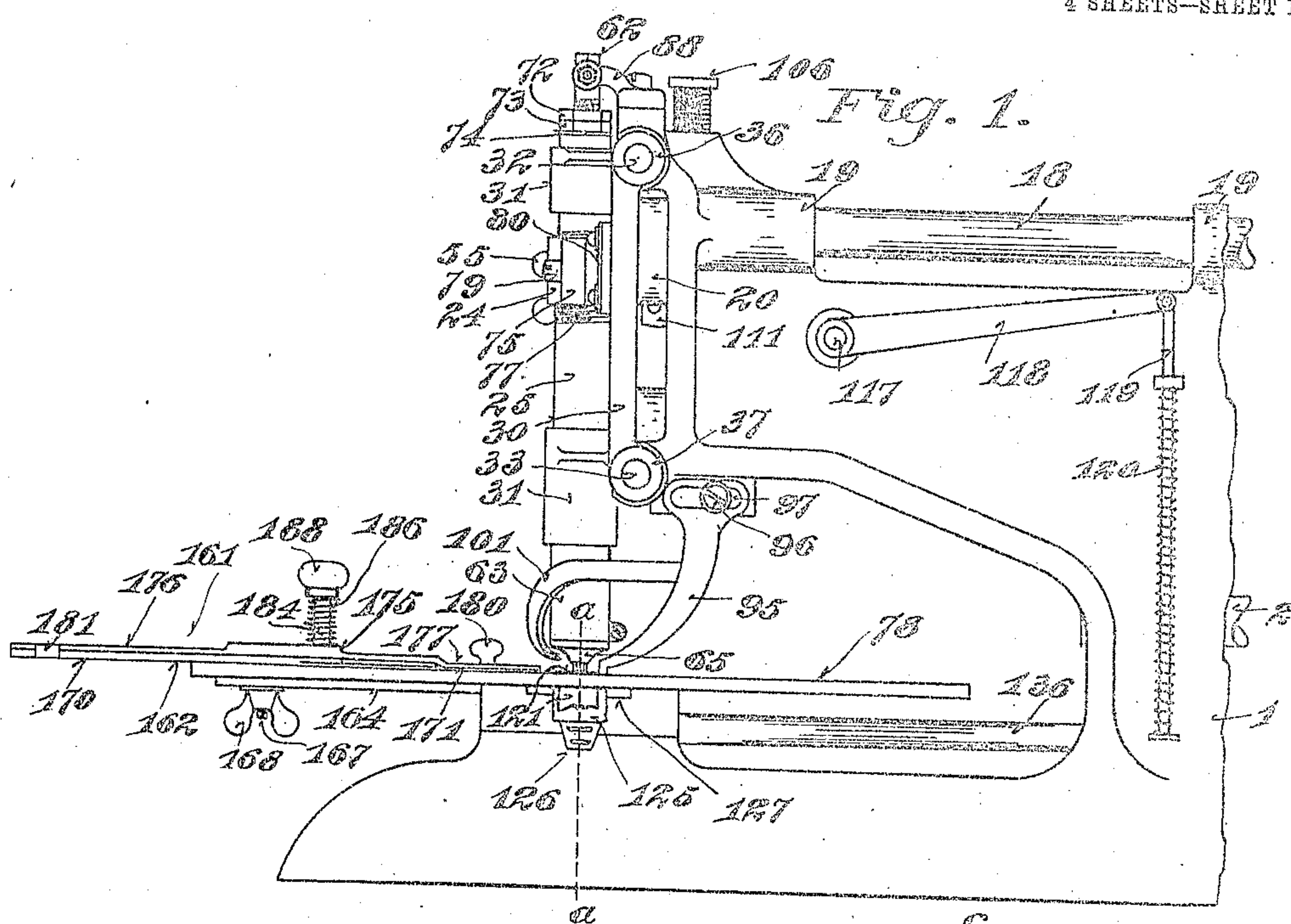
PATENTED FEB. 12, 1907.

W. F. LAUTENSCHLAGER.

PUNCHING MACHINE.

APPLICATION FILED SEPT. 15, 1905.

4 SHEETS--SHEET 1.



Witnesses.  
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Inventor:  
William H. Luntenschlager,  
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His Attorney



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Fig. 8.

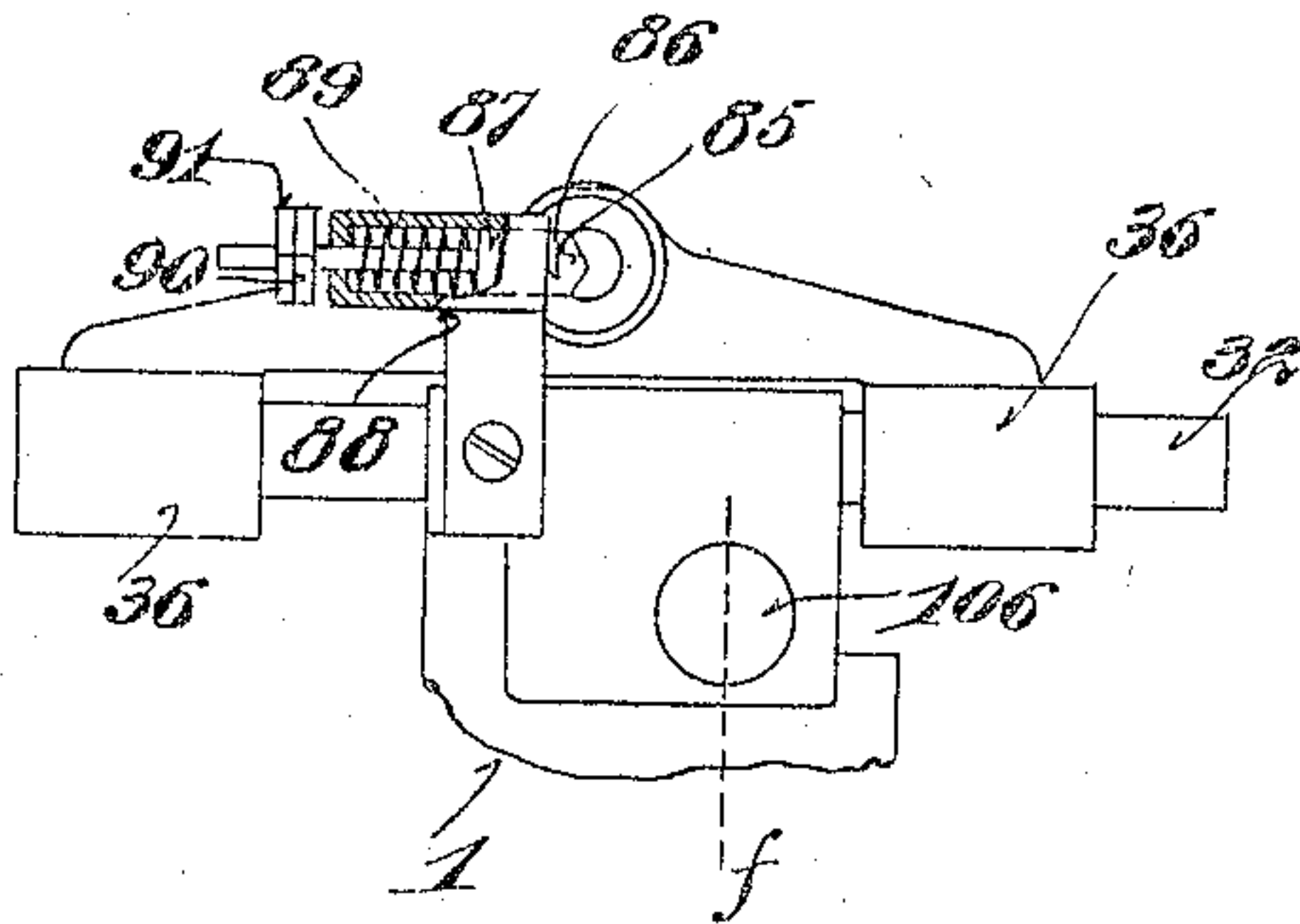


Fig. 4.

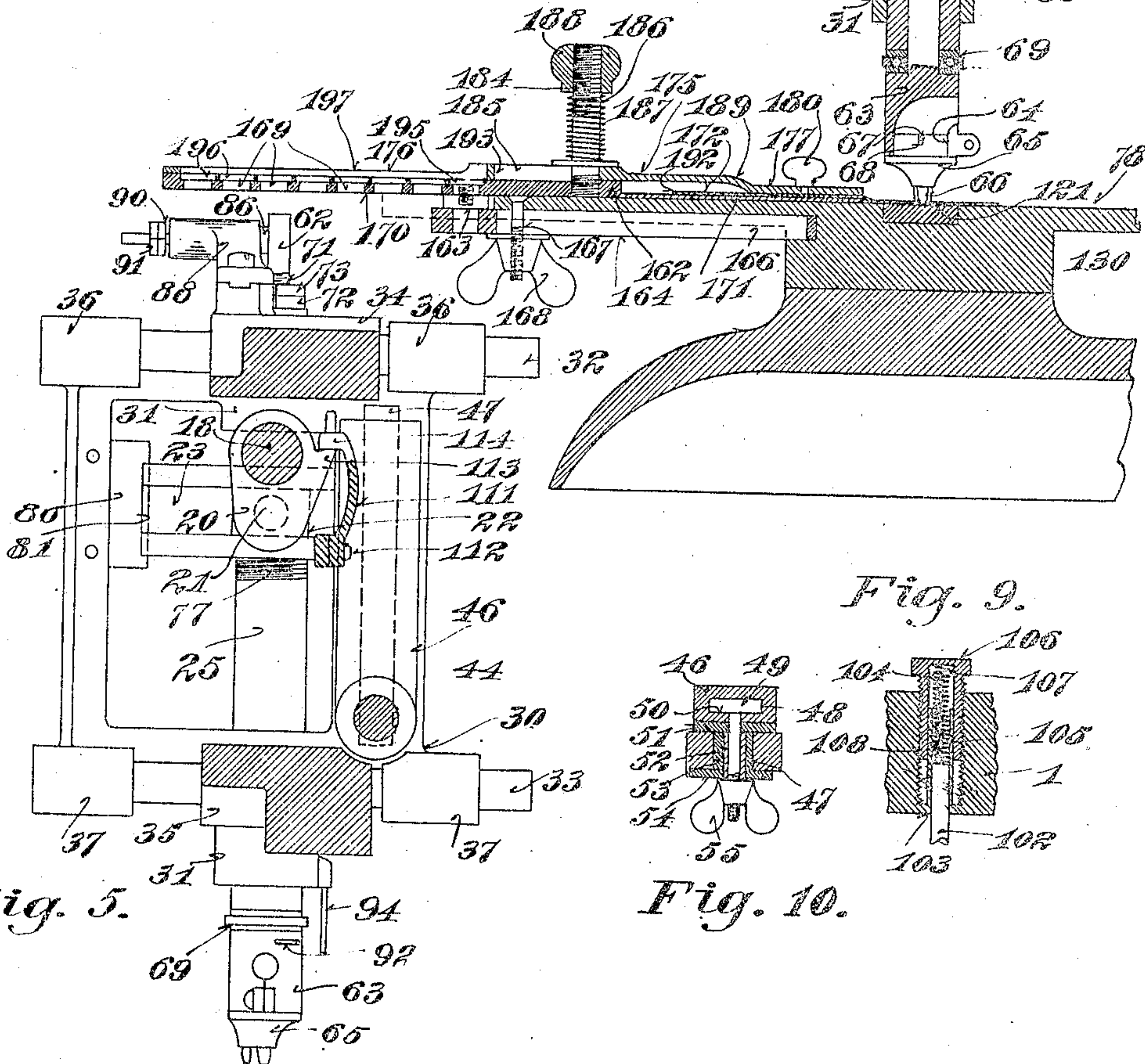


Fig. 5.

Fig. 9.

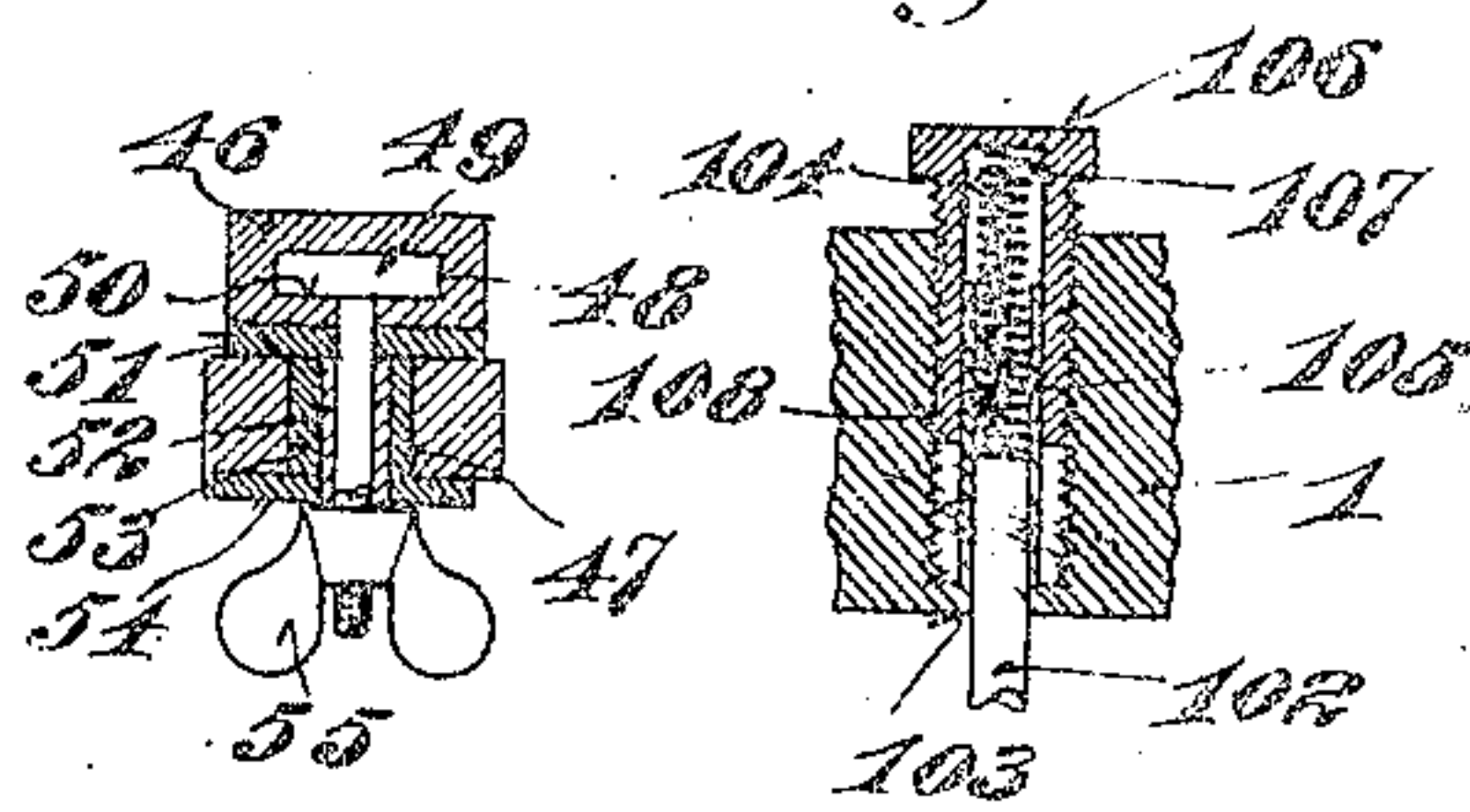


Fig. 10.

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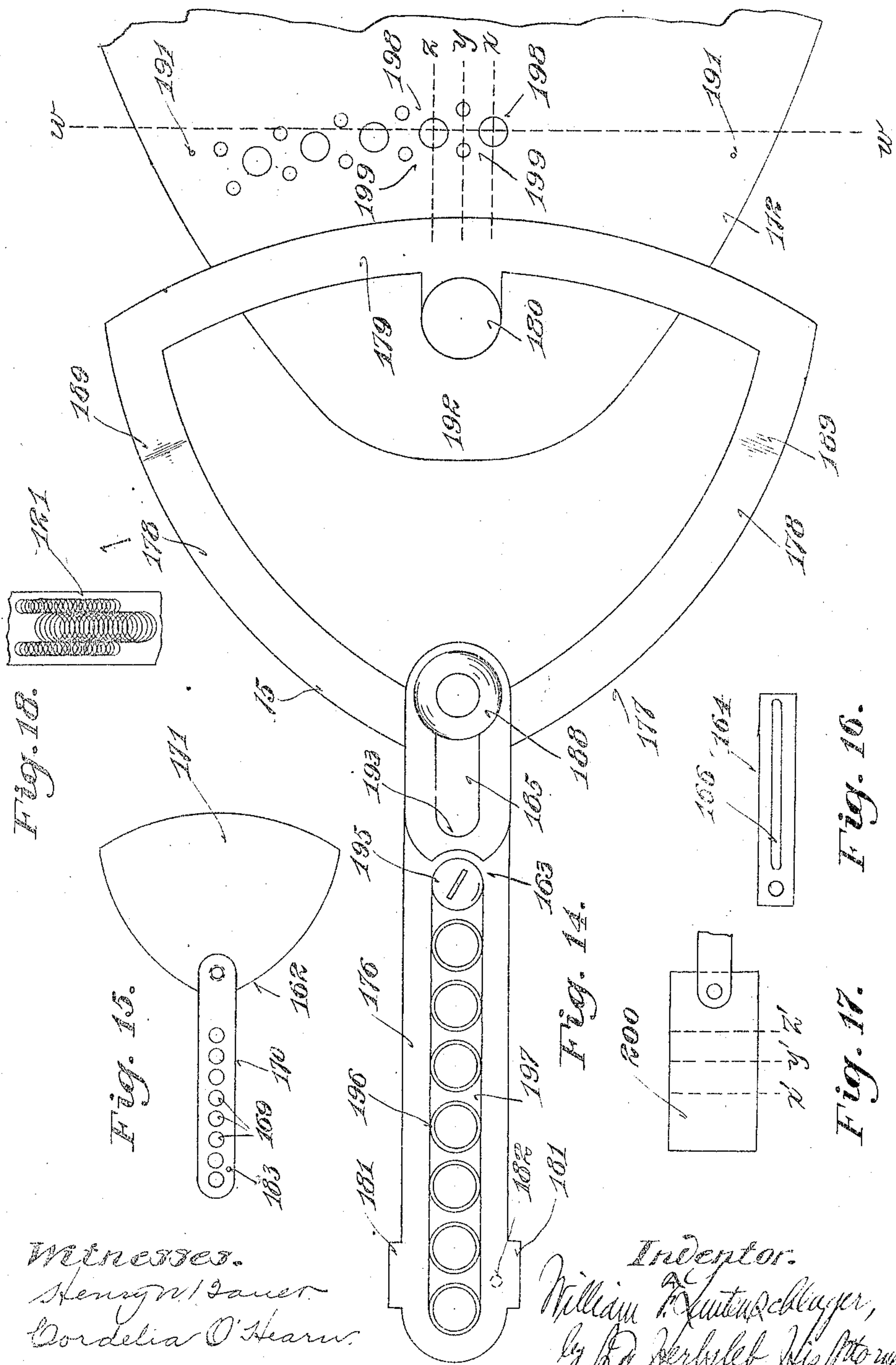
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4 SHEETS--SHEET 4.



Witnesses.  
 Henry M. Bauer  
 Cordelia O'Hearn.

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# UNITED STATES PATENT OFFICE.

WILLIAM F. LAUTENSCHLAGER, OF CINCINNATI, OHIO.

## PUNCHING-MACHINE.

No. 843,899.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed September 15, 1905. Serial No. 278,545.

*To all whom it may concern:*

Be it known that I, WILLIAM F. LAUTENSCHLAGER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Punching-Machines, of which the following is a specification.

My invention relates to punching-machines, especially adapted for providing the punchings upon boot or shoe uppers, harness, saddlery goods, and for similar purposes, and has for its object the providing in a machine of this character of novel punching operating mechanism, of means for determining and gaging the cross reciprocating of the punch, of novel means for providing a traveling cushion adapted to receive the impact of the cutting edges of the punch after piercing the material, and the providing of new and improved means for feeding stock, whereby the punching and other operations applicable for producing imitation tip-vamps for boots, shoes, slippers, and the like are accomplished, and for similar operations; and the invention will be readily understood from the following description and claims and from the drawings, in which latter—

Figure 1 is a front elevation of my improved device with its cam end broken away. Fig. 2 is a rear elevation of the same with its stock-guide broken away. Fig. 3 is a head end elevation of the same and showing the table and parts thereunder in vertical section on the line *a a* of Fig. 1. Fig. 4 is a vertical longitudinal section of the head end of the machine on the line *b b* of Fig. 3. Fig. 5 is a cross-section on the line *c c* of Fig. 2, showing the punch-ram head and punch-ram-reciprocating mechanism at the head end of the machine. Fig. 6 is a cross-section on the line *d d* of Fig. 2, showing the punch-ram-operating cam mechanism. Fig. 7 is a cross-section on the line *e e* of Fig. 2, showing the punch-ram-head cam mechanism. Fig. 8 is a detail in plan view of the punch-ram connections. Fig. 9 is a detail in vertical section on the line *f* of Fig. 8, showing the pressure-foot spring mechanism. Fig. 10 is a detail in cross-section on the line *g* of Fig. 3, showing the means for varying the cross-stroke of the punch-ram head. Fig. 11 is a bottom view of the machine-table broken away, showing the cushion-feed mechanism. Fig. 12 is a detail of the ratchet mechanism for the same. Fig. 13 is a side elevation of

the paper-guide. Fig. 14 is a plan view of the stock-guide. Fig. 15 is a plan view of the base of the same. Fig. 16 is a plan view of the shifting-bar of the same. Fig. 17 is a detail showing a shoe-feed; and Fig. 18 is a plan view of a section of the cushion-strip, showing the punch-marks thereon.

1 represents the frame of the machine, in which a driving-shaft 2 is journaled in bearings 3. The driving-shaft may be operated in suitable manner, as from a pulley 4. A cam 5 for reciprocating the punch-ram up and down is mounted on the driving-shaft. The driving-shaft may also carry a cam 6 for reciprocating the punch-ram head back and forth.

A cam-block 11 takes about the cam 5 and has contact-faces 12 13, with which the cam 5 engages. The cam-block also has a slot 14, the walls of which take against the shaft 2 during reciprocation of the cam-block. The cam-block has a link 15, which has articulation with a crank-arm 16, as by connecting with the same by means of pin 17. The crank-arm 16 is secured to a rock-shaft 18, journaled in bearings 19 in the frame and carrying a crank 20, on which there is a crank-pin 21, having journal connection with a slide-block 22, reciprocating in slideway 23 of an operating-block 24, secured in manner hereinafter described to the punch-ram 25 for reciprocating the punch-ram up and down for performing the punching operation.

The punch-ram is mounted on a punch-ram head 30 in bearings 31. This punch-ram head is preferably supported on rods 32 33, secured in bearings 34 35 of the frame, about which respective rods bearings 36 37 on the punch-ram head respectively take, the punch-ram head preferably reciprocating back and forth upon said rods in manner hereinafter described.

A cam-block 41 takes about the cam 6 for being operated thereby. It has cam contact-faces 42 43. This cam-block is pivoted on a rock-shaft 44, journaled in bearings 45 in the frame, and carries an arm 46, which arm is reciprocated by the rock-shaft and communicates its motion to the punch-ram, preferably by providing the punch-ram head with a slot 47, the arm 46 having a T-slot 48, in which a T-bolt 49 is adjustably placed. The head of the bolt 49 takes to inside the walls 50 of the slot 48, a washer 51 taking against the outer faces of said walls, a sleeve 52 taking about said bolt against said washer,



a block 53 being journaled about said sleeve and having sliding connection in slot 47, a plate 54 taking about said bolt and against said sleeve and loosely pinned to said block, a nut 55 taking about bolt 49 and against plate 54 for clamping the bolt and sleeve in desired position longitudinally of the arm 46. The bolt 49 and parts carried thereby are permitted longitudinal movement with relation to the slots, respectively, in the arm 46 and in the punch-ram head for imparting reciprocations of different lengths to the punch-ram head. Thus the nearer the bolt is secured toward the rocking axis of the rock-shaft 44 the less will be the length of stroke of cross reciprocation of the punch-ram head, and the farther from said axis the articulating means between said arm and rock-shaft are located the greater will be the length of stroke of said cross reciprocation. A slight movement between the articulating means and one of said slots is permitted after adjustment, owing to the fact that the arm 46 swings along an arc while the cross-travel of the punch-ram head is along horizontal lines. Adjacent the slot 48 there is a scale or gage 56, a finger 57 being on the plate 54 for registering with the markings of said gage in order to locate the articulating connection along said gage, and thereby impart desired length of cross reciprocation to the punch-ram head.

The punchings made with a machine of this character are of different lengths, and the feed is desired to be of the requisite length to properly space the various punchings. Thus some punches require a very small length of feed. Others require a maximum length of feed. I desire to divide the scale into degrees of given numbers representing the given travels of feed and to correspondingly mark the punches, so that the operator upon seeing the number of the punch may at once know that if the finger is set to a corresponding number on the gage the correct cross travel of the feed will be obtained.

In the form shown the punch-ram preferably comprises a casing 61, movable up and down in the bearings 31 on the punch-ram head. A punch-ram shank 62 has a punch-head 63, having a socket 64 for receiving a punch 65, and for locating the punching part 66 correctly about the longitudinal axis of the punch-ram I provide the head with a pin 67, taking into a slot 68 in the punch. The punch-shank is preferably permitted to rock with relation to the casing, as by having ball-bearing 69 between the punch-head 63 and the casing, the end of the shank being threaded, as shown at 71, for receiving set-nut 72 and lock-nut 73, a washer 74 being interposed between the set-nut and end of the casing. This construction permits adjustment of the rocking bearing of the shank.

The forward or initial part of the punching part 66 is preferably coincident with the rocking axis of the punch, the major part of the punch being to rear of said axis. For adjusting the punch-ram longitudinally in the head the operating-block 24 is provided with a clamping member 75 about an internally-threaded bore 76, taking about the outer threaded face 77 of the casing. Turning the casing raises or lowers the same with relation to the operating-block for bringing the cutting-face of the punch closer to or farther from the top plane of the table, the table being shown at 78. A set-screw 79 locks the parts in adjusted position. For preventing turning of the block relatively to the punch-ram head said head is provided with a plate 80 taking into a slot 81 in said block.

The punch-ram shank is provided with a preferably V-shaped recess 85, the walls of which are adapted to engage a correspondingly-shaped finger 86, the shank 87 of which is mounted in a bracket 88, secured to the frame, a spring 89 taking between the end of the shank and the bracket, suitable means being provided to prevent turning of the finger and nuts 90 91 limiting the outward movement of the finger. The punch-ram is also provided with stems 92 93, adapted to contact with a stop 94 on the punch-ram head for limiting the rocking motion of the punch-ram and preventing the recess 85 being thrown out of range with the finger 86. A stock-gage 95 is adjustably and releasably secured to the frame, as by having a set-screw 96 take into the frame through a slot 97 in said gage.

A pressure-foot 101 is mounted on a rod 102, reciprocating in bearings 103 in the frame, a spring 104 taking against the upper end of the rod and being seated in a recess 105 in upper bearing 103. A bolt 106 has a recess 107 for receiving the upper end of the spring and has threaded connection 108 with the frame for adjusting the tension of the spring. The rod has a bracket 111 adjustably secured thereto, as by a set-screw 112, the crank 20 having a finger 113 thereon taking against a shoulder 114 on the bracket 111 for automatically raising the pressure-foot 101 during operation of the machine. The bracket has an extension 115, under which a finger 116 is arranged to take for manually raising the pressure-foot, the finger 116 being mounted on a rock-shaft 117, having an arm 118 secured thereto, to which a link 119 connects, the link preferably extending below the frame of the machine into suitable position for carrying a suitable foot-plate for operating the pressure-foot with the foot, a spring 120 taking about the link against the arm 118 for aiding in automatically returning the pressure-foot into depressed position, the arm 118 being usually employed if it is



desired to raise the pressure-foot by hand. In the construction described the punch is given a cross reciprocation for feeding the material and a reciprocation up and down for performing the punching function.

In order to provide a clean-cut punching or perforation by the punch and to save wear upon the cutting-faces of the punch, I provide a traveling cushion to receive the final impact of the cutting-faces of the punch. In order to economize in the amount of cushion employed, I give this cushion only a slight feed with relation to the feed of the stock being operated upon. Thus 121 represents a strip of this cushion, which in practice is softer than metal and of such material as not to injure the punch and is preferably a narrow strip of paper fed to the machine from a suitable roll mounted on a suitable stud of the stand upon which the machine may be set. The cushion-strip preferably passes a tension member 122, which is shown as a spring-plate 123, secured to the bottom of the machine-table by screws 124 and for convenience having a lug 125, the paper passing between the plate and the under surface of the table and the lug permitting ready withdrawal of the spring from contact with the table for permitting insertion of the cushion-strip.

126 is a strip-guide, preferably comprising a plate 127, secured to the bottom of the machine-table and provided with slots 128 of different lengths to accommodate different widths of the cushion-strip. The cushion-strip then passes through a slot 129 in the table and over a bed-block 130, which is located under the punch and is preferably of hard material, as hardened steel, and forms an anvil for backing up the cushion-strip. The cushion-strip then passes through a slot 131 in the table and a strip-guide 132, similar to the strip-guide 126, the strip-guides at front and rear of the anvil guiding the strip in correct alignment with relation to the punch. The strip is then operated on by feeding device 135. In the form shown this comprises a feed-shaft 136, having on it a feed-wheel 137, which is preferably a toothed wheel engaging the feed-strip and so arranged that its contact with the latter communicates its motion to said strip, the cushion-strip preferably passing between the feed-wheel and an impact part 138 of the table. The feed-shaft is journaled in bearings 139. For operating the feed-shaft in the form shown it is provided with a ratchet-wheel 141. Said ratchet-wheel is operated from a rocker-arm 142, shown as secured to the rock-shaft 44 and having a link 143 articulated therewith in adjustable position thereon. Thus the rocker-arm is provided with a slot 144. A stud 145 is slidable in said slot and secured therein in suitable positions by means of a nut 146, the link 143 having a bearing 147 about

said stud. The lower end of the link has ratchet connection with the ratchet-wheel 141, as by having a ratchet-housing 148 rocking upon the feed-shaft 136, articulated with the link by means of a stud 149 and provided with ratchets 150, the said ratchets being spring-pressed toward the ratchet-wheel by means of springs 151 in slots 152 of said housing and alternately engaging said teeth. A plate 153 holds the ratchets in said slots. While one ratchet engages a given tooth the other ratchet is riding upon another tooth, and vice versa, for permitting the teeth to be made coarser and stronger than if only one ratchet were employed. The nearer the stud 145 is placed to the rocking axis of the shaft 44 the less will be the motion of the ratchet-housing 148, and consequently the less will be the circumferential travel of the feed-wheel, whereas the farther the stud 145 is placed away from the rocking axis of the rock-shaft 44 the greater will be the circumferential travel of the feeding-surface of said feed-wheel and the consequent feed of the cushion-strip. The relations of parts are such that preferably an appreciably less feed is imparted to the feed-strip than the distance of cross-feed of the stock, and while the punchings upon the stock follow one another the punch-marks upon the cushion-strip need be relatively advanced only substantially the distance of the width of a single cutting edge of the punch-tube, which in practice is very slight, and the relative travel of the stock with relation to the travel of the cushion-strip may be only, for example, the ratio of one inch or less travel in the cushion-strip to the travel of one foot in the stock, thus effecting a material saving in the amount of cushion-strip employed. In Fig. 18, for instance, I have shown the relative impressions left upon the cushion-strip by the punch, from which it will be seen that successive impressions by the punch upon the cushion-strip overlap each other, while by reference to Fig. 14 it will be seen that the successive impressions upon the stock are wholly in advance of one another.

The cushion-strip in practice may be a strip of comparatively thin paper—say of one-hundredth of an inch in thickness—and is especially useful in a punch-feeding punching-machine of the character of that herein shown and described, as the rearward cross-feed of the punch takes place while the punch points or tubes are embedded in the stock after and during a slight rise in the punch, the cushion-strip insuring that such embedding shall be definitely effected, so that the punch may carry the stock with it in its rearward cross reciprocation without fail. Thus the relation of the rock-shaft 18 to the crank-pin 21 is such that at its initial descent the punch-ram is forced downwardly to its full extent when the crank-pin 21 is



vertically under the rocking axis of the rock-shaft 18, the rock-shaft, however, continuing its rocking motion slightly beyond this center in order to slightly raise the crank-pin, and thereby slightly raise the punch sufficiently, preferably to allow it to clear the cushion-strip in its rearward crosswise travel, while, however, being still embedded in the stock for feeding the stock in such cross-travel, the slide-block 22 remaining stationary in such slightly-raised position during said rearward cross travel of the punch which now takes place for performing its feeding function. The crank-pin then rocks in reverse direction past its lowermost position for raising the punch out of the stock, the cam 6 then causing retraversing of the punch-ram head forwardly to initial position. The pressure-foot and its connections are so timed that the pressure-foot contacts the stock from the end of the feeding operation until the punching operation takes place. In the meantime if imitation tip-vamps are being punched or similar operations performed the stock is being swung about its pivotal support in the manner now to be described.

161 is a stock-guide especially applicable for use in punching or performing other operations on imitation tip-vamps and for similar purposes of guiding stock in the manner described. Imitation tip-vamps are provided with punchings, and upon each side of said punchings concentric therewith they are provided with a row of stitching to imitate the stitching in genuine tip-vamps, a false strip of suitable material being placed under the punchings for hiding the inner lining of the shoe. The punching is performed by the reciprocating tool herein shown, as the punch and the sewing upon this and other similar work is performed by the reciprocating tool exemplified as a needle.

The stock-guide comprises a base 162, swinging upon a pivot 163, mounted on a bar 164, adjustably attached to the table 18 of the machine, as by having a slot 166, through which a bolt 167 on the table takes, a nut 168 taking over the bolt and clamping the bar 164 in adjusted positions to the table. The base is provided with a series of apertures 169, into any of which the pivot 163 is arranged to take. The base preferably comprises a rearwardly-extending bar 170, in which the apertures 169 are provided, and a widened stock-supporting platen 171. This platen is preferably very thin, so that the stock represented at 172, showing an imitation tip-vamp, may be carried thereby without being raised appreciably from the level of the table-top.

175 is a clamp which has a rearwardly-extending bar 176 and a widened clamping part 177, preferably comprising side extensions 178 and an arc connection 179, having a

button 180 for raising or moving the same. The clamp has lugs 181, arranged to take against the side faces of the bar part 170 of the base, and has a finger 182, arranged to take into a depression 183 in the base for positioning the clamp. A bolt 184 projects from the base through a slot 185 in the clamp, a spring 186 normally forcing the clamp toward the base. A washer 187 may be interposed between the spring and clamp and a nut 188 provided for adjusting the tension of the spring. Preferably the reciprocating tool end only of the clamp takes against the stock, as shown by the bend 189 in the clamp.

In practice the vamp or other stock before being operated on by the reciprocating tool is provided with small points or marks (indicated at 191) to indicate to the operator the distance from the outer end of the stock at which the perforations or other operations are to be made by the machine. In employing my improved stock-guide the stock is placed upon the base with its outer end 192 toward the pivot 163. The clamp 175 is shoved inwardly, thereby bringing the outer end 193 of the slot 185 against the bolt 184. The stock is then adjusted so that the points 191 will be substantially coincident with the inner face of the arc connection 179, which brings the stock into correct relation to the vertical plane of the reciprocating tool to receive the same in proper position. The clamp 175 is then raised while the stock is held in position and shifted for bringing the inner end of slot 185 against the bolt 184 and then released, thereby holding the stock in position for receiving its operations and out of the way or range of the action of the reciprocating tool. The stock and base are swung upon the pivot 163 for bringing the stock into proper position for receiving the operations by the reciprocating tool, the machine automatically feeding the stock about the pivot 163 until the operation is completed, whereupon the stock is released and a fresh piece inserted for repeating the operation. In raising or moving the clamp the operator usually rests the ball of his hand on the nut 188 while manipulating the button 180 with his thumb and fingers, thereby preventing displacement of the base off its pivot; but, if desired, the pivot may have a retaining-screw 195, whose head takes into recesses 196 adjacent to the apertures 169, for preventing accidental displacement of the base, and the bar 176 may have a slot 197 for convenience in getting at the screw 195. In setting the stock-guide the diameter of circle upon which the operation is to be performed by the reciprocating tool is first determined, this circle varying with different size and style of vamps or other work. Each of the apertures 169 represents a center of different circle of swing. Thus the inner aperture may represent a thirteen-inch circle and the



outer aperture a twenty-inch circle, the other apertures representing intermediate circles, or the apertures may have any other value or there may be any number of apertures.

5 Assuming now that it is desired to punch upon a fifteen-inch circle, the machine having previously been set to punch upon a different circle, the nut 168 is relieved for permitting shifting of the bar 164, the base-

10 piece is raised away from the pivot and again placed about the pivot, with the third aperture from the inner end of the series of apertures registering with the pivot. The clamp is then slid inwardly for causing the

15 outer end 193 of the slot 185 to contact the bolt 184. The vamp to be punched is then placed under the punch in proper position for receiving the punches on the correct line and the inner edge of the clamp caused to

20 register with the points 191 upon the vamp. The nut 168 is then turned and slotted bar 164 clamped to the table, thereby positioning the base and clamp for subsequent operations, and the clamp slid back out of range of

25 the punch a sufficient distance preferably to also accommodate the pressure-foot between the punch and the clamp. The inner end of the clamp is preferably on the arc of the smallest circle accommodated by the swinging base.

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In the construction shown the punch in feeding rocks upon its rotary axis and is automatically returned to initial position at the beginning of the punching stroke. As

35 the punch-ram moves rearwardly for feeding the stock it swings the vamp upon the pivot 163 and at the same time rocks about its rotary axis for accommodating changing positions of the holes in the vamp during its

40 swing, it being understood that during such rearward reciprocations of the punch for performing the feeding action the punch-ram does its traveling in a straight line, (indicated by the line *ww* in Fig. 14,) the punch-ram also

45 rocking slightly upon its rotary axis. In order to approximate this rotary shifting of the punch due to the swinging of the clamp as nearly as possible with the right line of travel of the punch-ram head, I mount the

50 pivot 163 to one side—that is, in rear of the lateral plane in which the initial or toe part of the punching part of the punch is located while descending for performing its punching function. Thus in Fig. 14 the dotted line *x*

55 represents the lateral plane in which the initial or toe part of the punching part of the punch moves in its descent for performing the punching action, and the dotted line *y* represents the lateral plane of the pivot 163.

60 I have found that an advisable distance between these lateral planes is one-fourth inch for usual work in punching vamps, although it is of course readily understood that I do not restrict my invention to any particular

65 distance. In this manner it will be noted

that the distance of feeding action in the example of punching shown in the drawings is represented by the distance between the respective toes 198 of the respective punchings 199 on the vamp 172 and that the feed of the

70 punching just performed will be from the line *x*, representing the lateral plane of the beginning of the feeding operation, to the line *z*, representing the lateral plane of the ending of that feeding operation, the lines *x z* representing the limits of the feeding operation,

75 and that the pivot 163 is located in a lateral plane intermediate of the limits of feeding action of the punch—that is, said lateral plane is between the beginning and the end of the

80 feeding action for the punching just performed—and this is preferably the case whether the feeding action is performed by the punch itself or by an ordinary feeding-shoe, the strain upon the stock during said

85 feeding action being thereby reduced to the minimum.

In Fig. 17 I have shown an ordinary shoe-feed, in which 200 represents the feeding-block, reciprocated in any ordinary or well-

90 known manner, the feeding block or shoe usually having an upper roughened surface for contacting against the under face of the stock, a pressure-foot operated in suitable manner taking against the stock above the

95 feeding-block and moving rearwardly with it for causing impingement of the stock against the block for feeding the stock. In this exemplification *y'* represents the lateral plane of the rocking axis of pivot 163. *x'* represents

100 the beginning, and *z'* the ending, of the feeding stroke.

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

105

1. In an imitation-tip-vamp punch-feeding punching-machine, the combination with a feeding-punch, of a cushion-strip thereunder, a pivoted vamp-support, means for automatically feeding said punch for causing the

110 punches on the vamp to follow one another, and means automatically feeding said cushion-strip for causing the punch-marks thereon to overlap one another, for the purpose specified.

115

2. In an imitation-tip-vamp punch-feeding punching-machine, the combination with a feeding-punch, of a cushion-strip thereunder, a pivoted vamp-support, a clamp thereon comprising a vamp-gage, means for shifting

120 said gage beyond said support for positioning the vamp and retracting said gage when clamping the vamp, means for automatically feeding said punch for causing the punch-

125 marks on said vamp to follow one another, and means automatically feeding said cushion-strip for causing the punch-marks thereon to overlap one another, for the purpose specified.

3. In an imitation-tip-vamp punch-feed-

130



ing punching-machine, the combination with a feeding-punch, of a cushion-strip thereunder, a vamp-support, a pivot on which the latter swings, means for automatically feeding said punch for causing the punch-marks on the vamp to follow one another, and means automatically feeding said cushion-strip for causing the punch-marks thereon to overlap one another, said pivot located in a transverse plane between the transverse planes of the limits of feeding motion of said punch, for the purpose specified.

4. In a punch-feeding punching-machine, the combination with the frame, punch-ram head, and slideway between said frame and punch-ram head, of a rocker-arm having articulation with said punch-ram head in substantially the vertical plane of said slideway, said articulation being adjustable lengthwise of said rocker-arm for adjusting the length of transverse reciprocation of said punch-ram head, substantially as described.

5. In a punch-feeding punching-machine, the combination with the frame, punch-ram head, and slideway between said frame and punch-ram head, of a rocker-arm, and means adjustable along said rocker-arm and up and down on said punch-ram head for articulating said rocker-arm to said punch-ram head for combined movement, said rocker-arm and last-named means being in substantially the vertical plane of said slideway, substantially as described.

6. In a punch-feeding punching-machine, the combination with the punch-ram head, of a rocker-arm, and means adjustable along said rocker-arm for uniting said rocker-arm and punch-ram head for combined movement, and a gage at said uniting means for determining the point of said uniting.

7. In a punch-feeding punching-machine, the combination, with the punch-ram head, of a rocker-arm having a guideway extending along said rocker-arm, said punch-ram head having a guideway, articulating means between said rocker-arm and punch-ram head adjustable along said guideways, and a gage along one of said guideways for indicating the desired position of said articulating means, substantially as described.

8. In a punching-machine, the combination, with a punch-ram head and punch-ram, of a cushion for the punch of said machine, means for automatically feeding the stock in a direction transverse of the longitudinal axis of said punch-ram, and means for feeding said cushion a substantially less distance than the distance of feed of said stock.

9. In a punching-machine, the combination, with the punching means, of automatic step-by-step feeding means for the stock, a cushion under said stock, automatic means for feeding said cushion, said feeding means for said stock feeding said stock across the face of said cushion, the distance of feeding

of said stock being materially greater than the distance of ultimate feed of said cushion.

10. In a punch-feeding punching-machine, the combination, with a punch-feeding punch having cross-reciprocation, and a cushion under said punch having automatic travel of materially less extent than the distance of cross-reciprocation of said punch.

11. In a punch-feeding punching-machine, the combination, with a punch-ram head and punch-ram, of means automatically cross-reciprocating said punch-ram head and reciprocating said punch-ram up and down, of a cushion-strip under said punch-ram at its downward reciprocation, and means for automatically feeding said cushion-strip a less distance than the distance of cross-reciprocation of said punch, for the purpose specified.

12. In a punch-feeding punching-machine, the combination with a punch-ram head and punch-ram, of means automatically cross-reciprocating said punch-ram head for feeding the stock, means for automatically reciprocating said punch-ram up and down, of a cushion-strip, and means for automatically feeding said cushion-strip, the resulting feeding of said cushion-strip being materially less than the resulting cross-feeding of said stock, substantially as described.

13. In a punching-machine, the combination with a punch, of a cushion-strip thereunder, means for automatically reciprocating said punch, means for automatically feeding the stock in step-by-step movements, means for automatically feeding said cushion-strip under said punch in step-by-step movements of less distances than the distances of the step-by-step movements of feed of said stock, for causing successive punch-marks of said punch upon said cushion-strip to overlap and for causing successive punch-marks of said punch upon said stock to follow one another, for the purpose specified.

14. In a punching-machine, the combination, with a punch-ram head and means for feeding the stock, of a cushion-strip, a feed-wheel acting thereon, a rock-shaft and rocker-arm, a link having connection with said feed-wheel for operating the same, means for articulating said link adjustably along said rocker-arm, and tensioning means for said cushion-strip, said tensioning means acting in advance of said punch-ram head upon said cushion-strip for the purpose specified.

15. In a machine having a reciprocating tool for operating on the stock, the combination of a swinging supporting-plate for stock, and a tension-clamp acting on said stock swinging therewith and independently of said reciprocating tool, substantially as described.

16. In a machine having a reciprocating tool for operating on the stock, the combination of a swinging stock-supporting plate, a tension-clamp for the stock mounted on and



swinging with said plate, and means for shifting said clamp on said plate toward and from the vertical plane of said tool, substantially as described.

5 17. In a punching-machine, the combination, with a punch-ram head, of a step-by-step feeding means for the stock, a swinging support for the stock being fed, a clamp thereon for said stock, a pivot on which said support swings, said pivot being located in transverse plane between the limits of said step-by-step feeding motion of said feeding means, substantially as described.

15 18. In a machine having a reciprocating tool for operating on the stock, the combination of a swinging support for the stock, a pivot therefor, means for adjusting said pivot laterally toward and from the vertical plane of said tool, means for adjusting the pivotal position of said pivot on said support, a stock-clamp on said support moving therewith, said stock-clamp having a guide edge adjacent the vertical plane of said tool, and means permitting movement of said stock-clamp for shifting said guide edge laterally beyond said support for guiding the positioning of said stock on said support and for returning said clamp to clamping position, substantially as described.

20 19. In a punching-machine, the combination, with a punch-ram head and punch-ram, of a swinging support for the stock, a pivot therefor, means for adjusting said pivot laterally toward and from the vertical plane of said punch-ram, means for adjusting the pivotal position of said pivot on said support, a stock-clamp having a guide edge adjacent the vertical plane of said punch-ram and means permitting movement of said stock-clamp for shifting said guide edge laterally beyond said support for guiding the positioning of said stock on said support and for returning said clamp to clamping position, substantially as described.

erally beyond said support for guiding the positioning of said stock on said support and for returning said clamp to clamping position, feeding means for the stock traveling within limits, the said pivot being located in lateral plane intermediate of the lateral planes of said limits of travel of said feeding means.

20. In a punch-feeding punching-machine, the combination, with the punch-ram head and punch-ram of means for automatically cross-reciprocating said punch-ram head, means automatically reciprocating said punch-ram up and down, an anvil under said punch at its downward reciprocation, a cushion-strip above said anvil under said punch, means for automatically feeding said cushion-strip, the resulting feeding of said cushion-strip being materially less than the feed imparted to the stock by said punch, a swinging stock-support, an adjustable pivot therefor, a stock-clamp on said support having a stock-gage adjacent the vertical plane of the punch-ram position, means for shifting said clamp for bringing said gage beyond said support and for permitting retraction of said gage to initial position, and constructed and arranged for feeding the stock in an arc described from said pivot above said cushion-strip and causing the punch-marks on said stock to follow one another and the punch-marks on said cushion-strip to overlap, substantially as described.

In witness whereof I have signed my name hereto in the presence of two subscribing witnesses.

WILLIAM F. LAUTENSCHLAGER.

Witnesses:

HENRY N. BAUER,  
CORDELLA O'HEARN.