(No Model.) 4 Sheets—Sheet 1.

F. MOLLOY.

LASTING MACHINE.

No. 486,730. Patented Nov. 22, 1892.

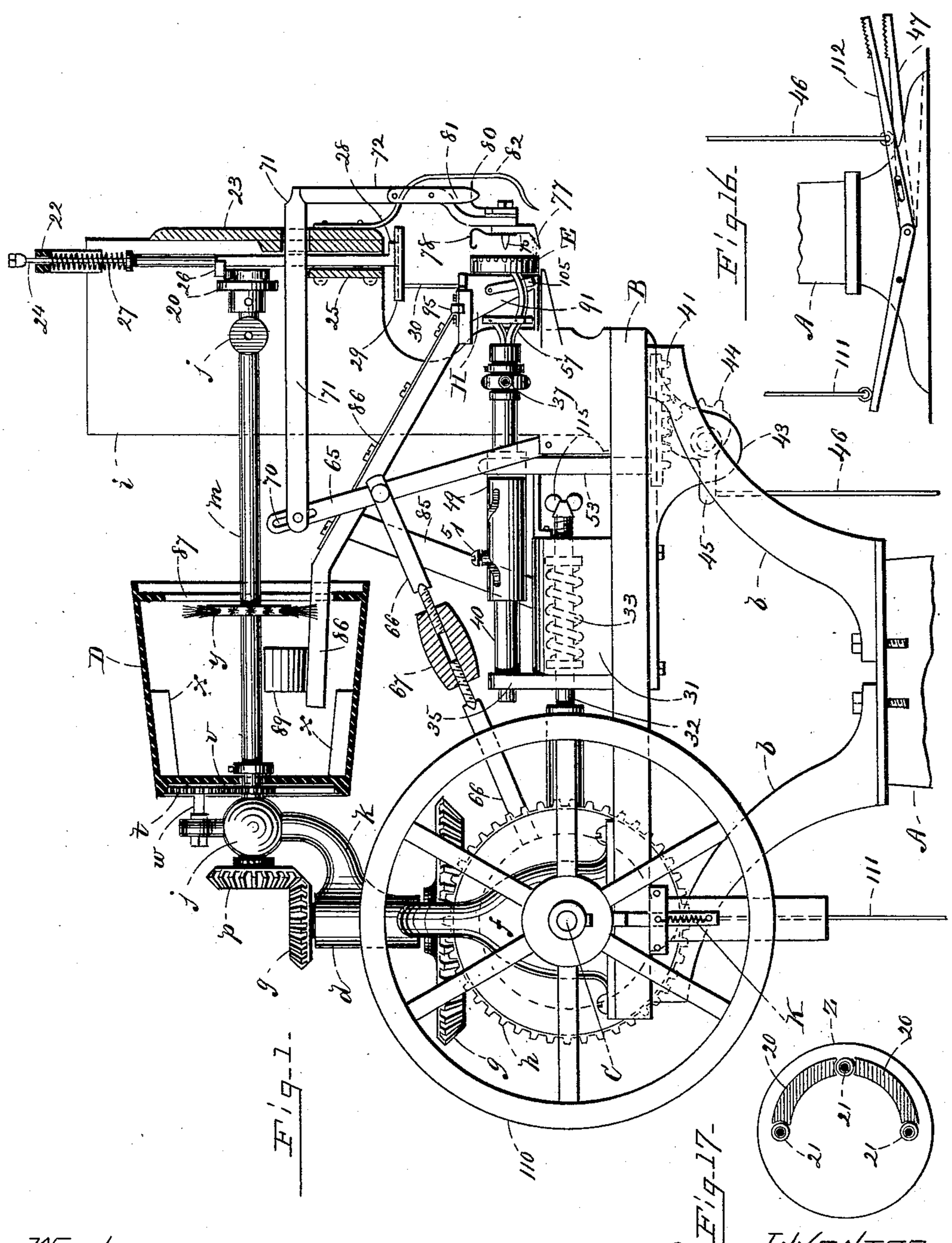

Fig. 1.

Fig. 16.

Fig. 17.

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(No Model.)

4 Sheets—Sheet 2.

F. MOLLOY.

LASTING MACHINE.

No. 486,730. Patented Nov. 22, 1892.

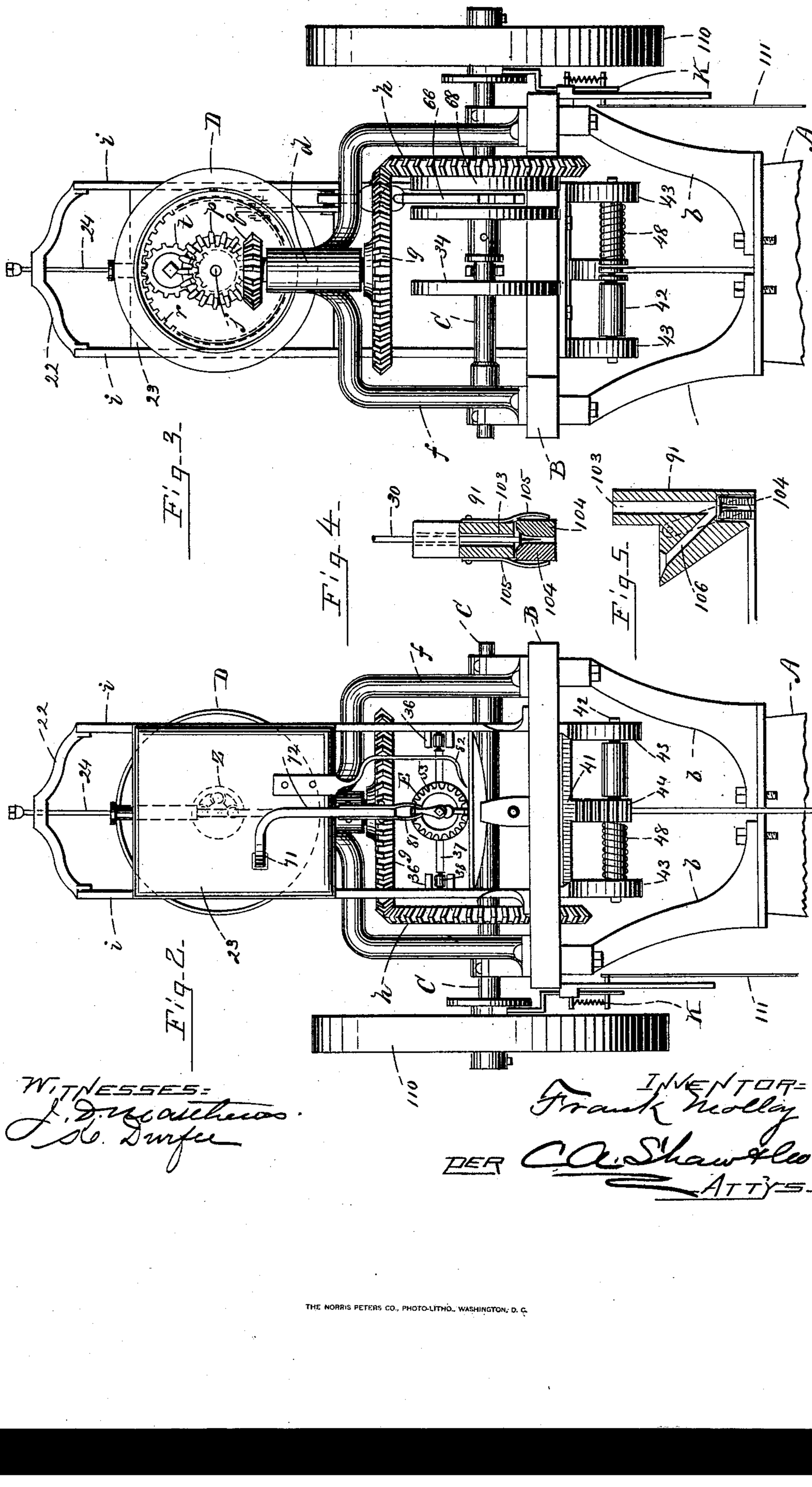

Fig. 2.

Fig. 4.

Fig. 5.

Fig. 2.

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(No Model.) 4 Sheets—Sheet 3.

F. MOLLOY.

LASTING MACHINE.

No. 486,730. Patented Nov. 22, 1892.

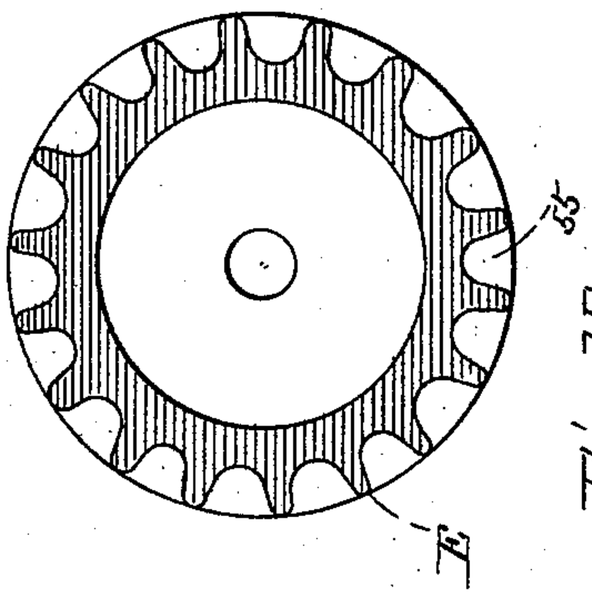

Fig. 10.

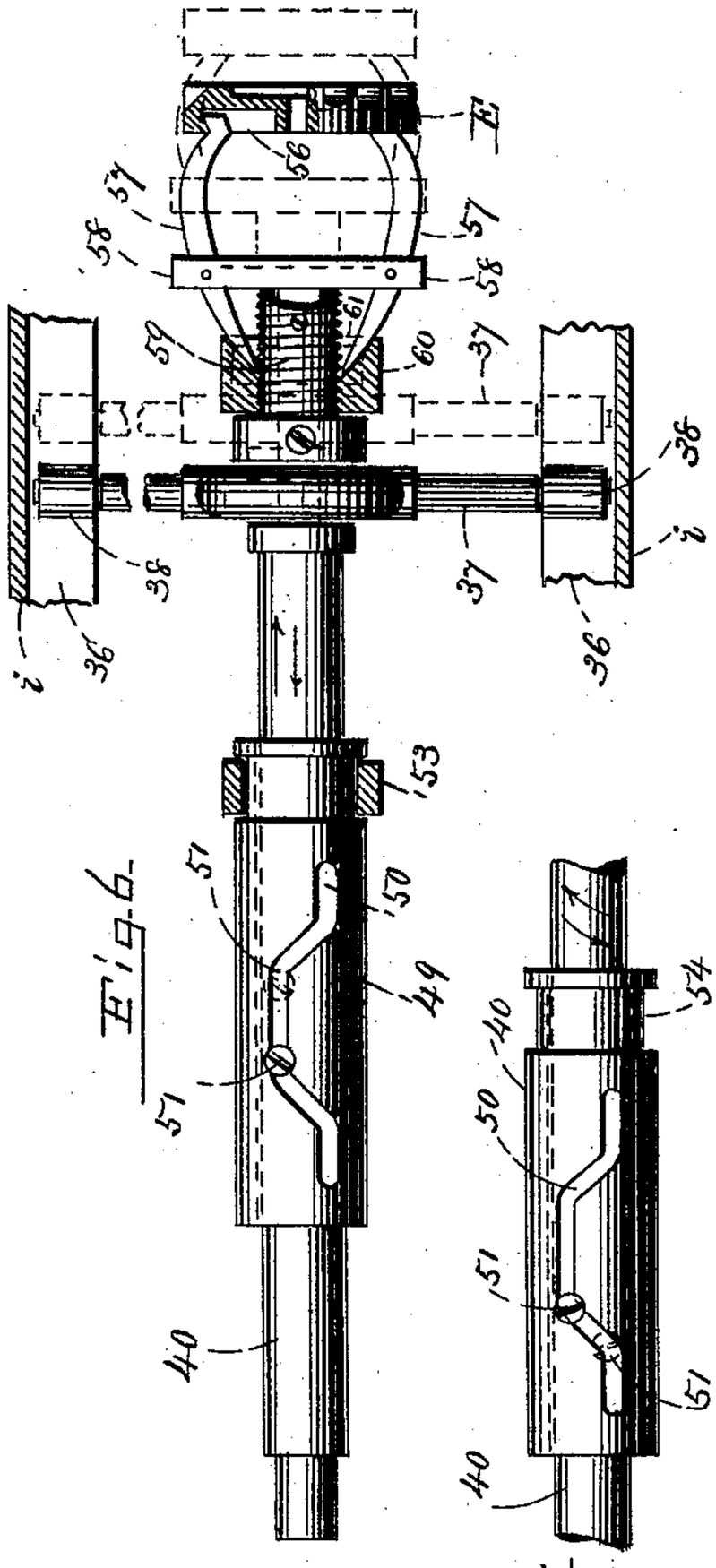

Fig. 5.

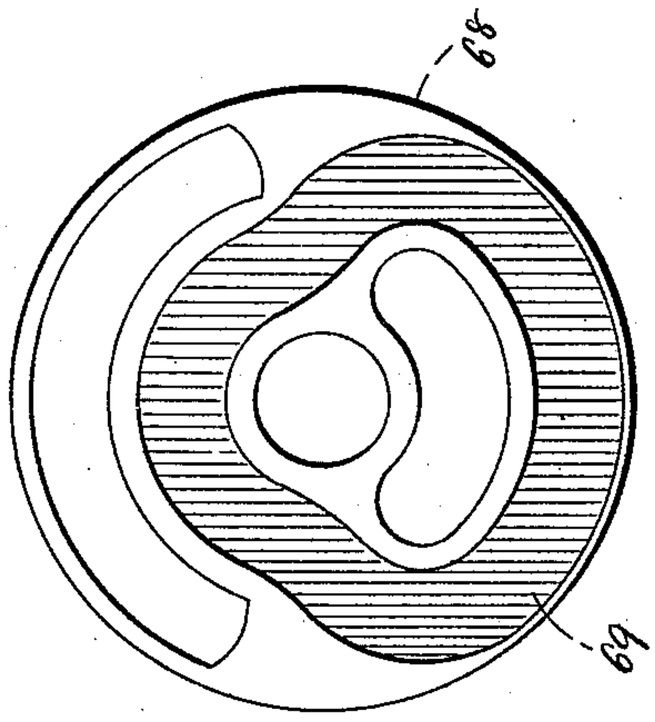

Fig. 4.

Fig. 6.

Fig. 7.

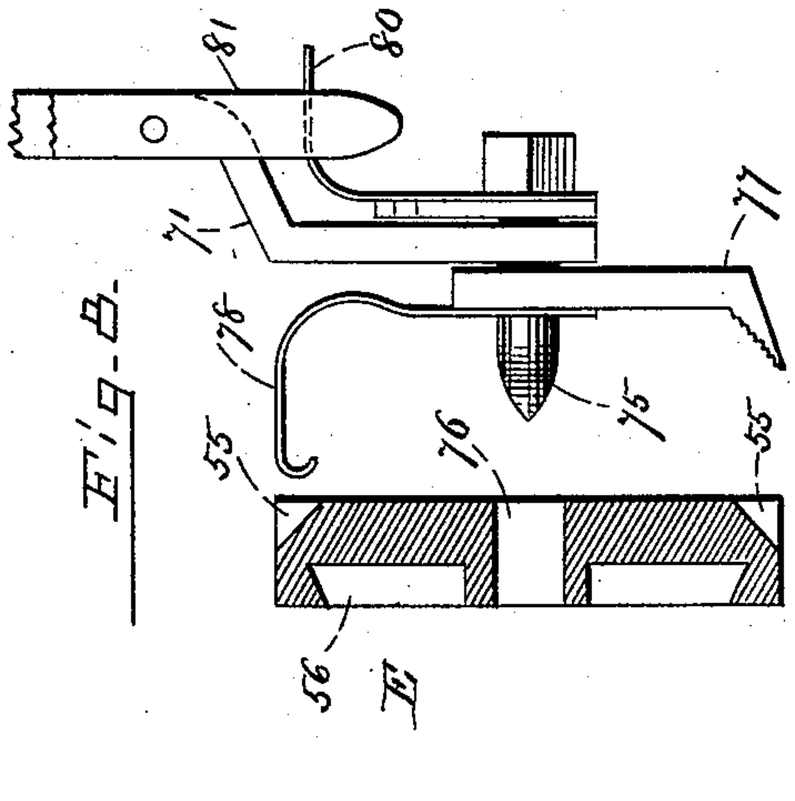

Fig. 8.

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4 Sheets—Sheet 4.

F. MOLLOY.

LASTING MACHINE.

No. 486,730. Patented Nov. 22, 1892.

Fig. 15.

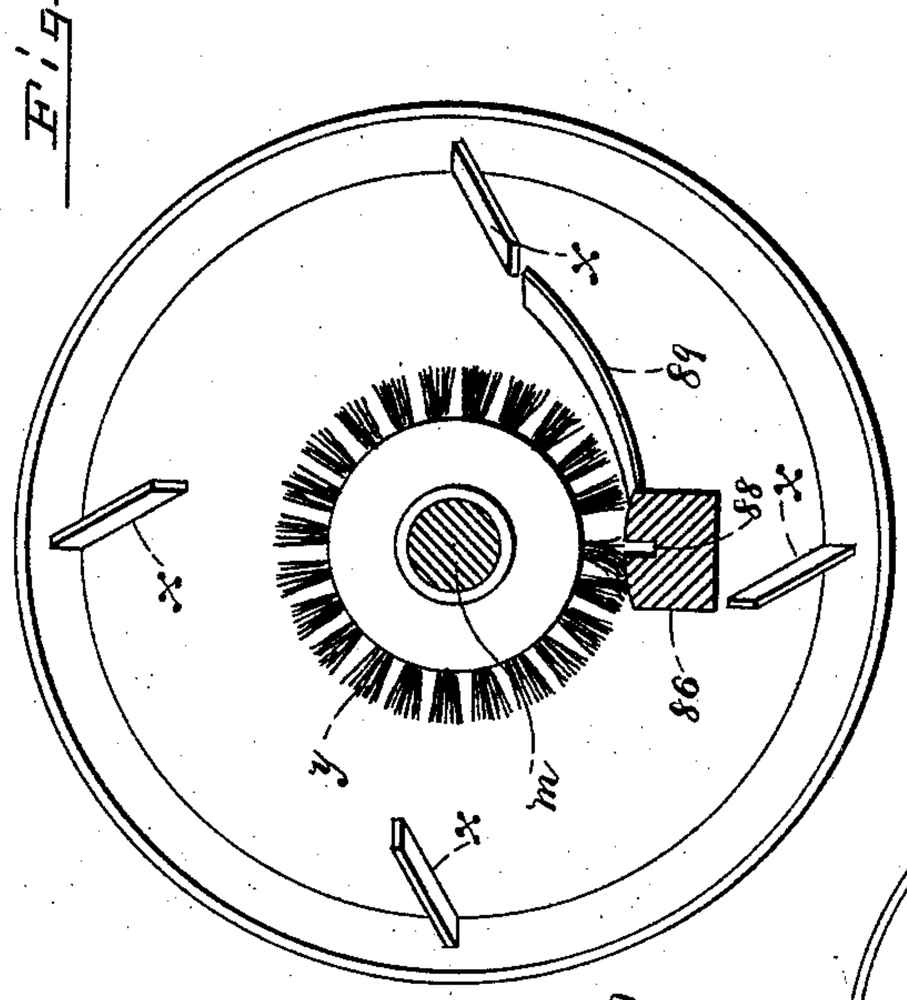

Fig. 14.

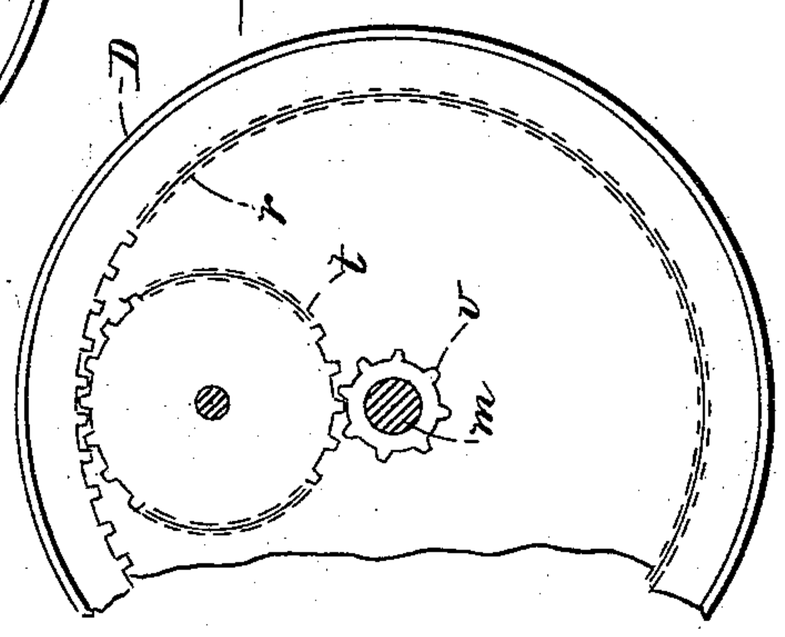

Fig. 11.

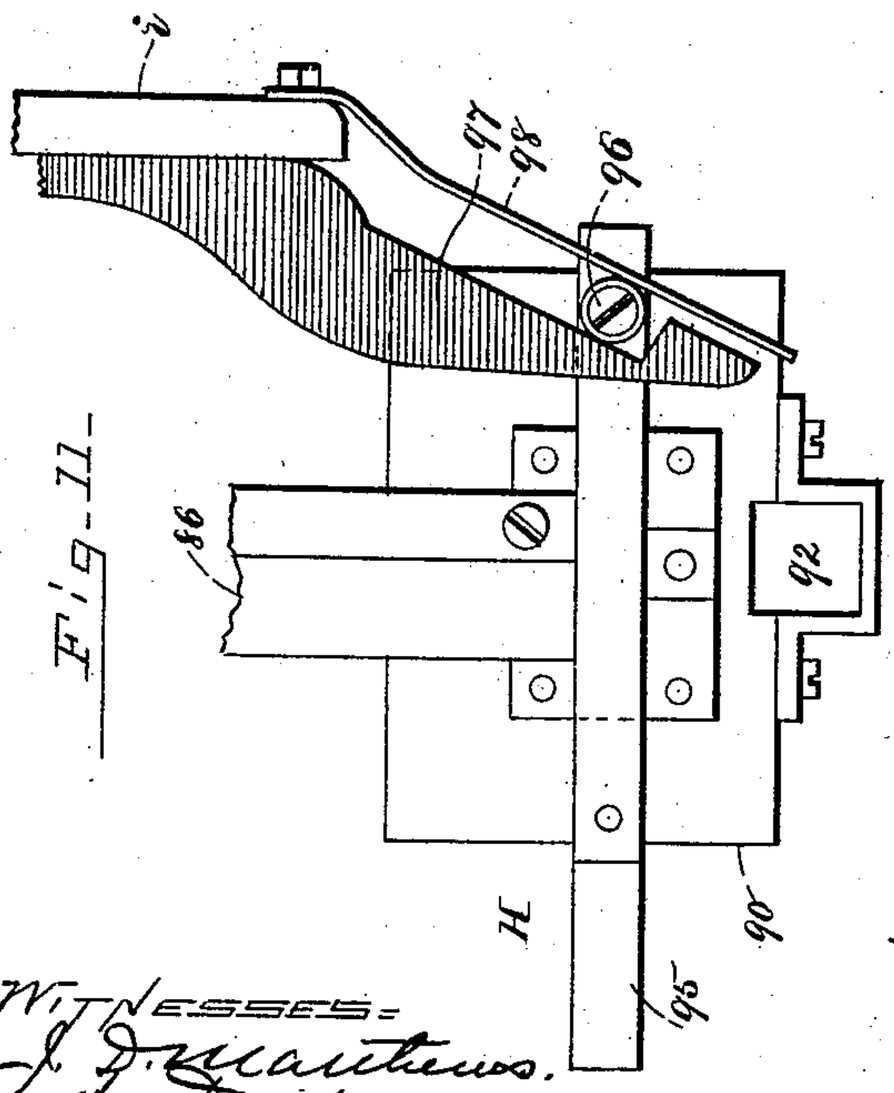

Fig. 12.

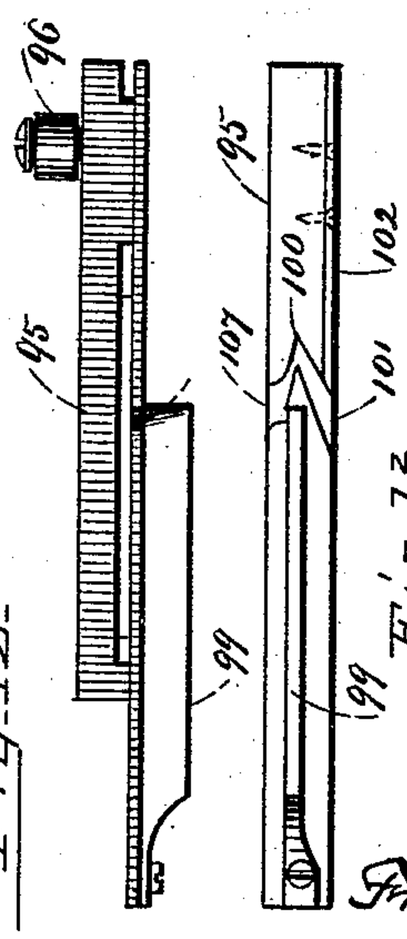

Fig. 13.

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UNITED STATES PATENT OFFICE.

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LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 486,730, dated November 22, 1892.

Application filed July 20, 1891. Serial No. 400,013. (No model.)

To all whom it may concern:

Be it known that I, FRANK MOLLOY, of Haverhill, in the county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Lasting-Machines, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my improved lasting-machine; Fig. 2, a front elevation of the same; Fig. 3, a rear elevation; Figs. 4 and 5, sectional elevations of the tack-guide; Fig. 6, a top plan view, partly in section, of the cam, crimping-wheel, and connecting mechanism; Fig. 7, a plan of the cam; Fig. 8, a side elevation of the clamping claw or finger and adjunctive mechanism, the crimping-wheel being shown in vertical transverse section; Fig. 9, a side elevation of the main cam-wheel; Fig. 10, a front elevation of the crimping-wheel; Fig. 11, a top plan view of the tack-separator mechanism; Fig. 12, a front elevation of the separating-bar; Fig. 13, a bottom plan view of the same; Fig. 14, a rear elevation of the tack barrel or hopper, a portion being shown as broken away; Fig. 15, an elevation showing the interior of the same from the front; Fig. 16, an elevation of the base of the standard, showing treadles; and Fig. 17, a front elevation of the hammer-cam.

Like letters and numerals of reference indicate corresponding parts in the different figures of the drawings.

My invention relates to machines for lasting boots or shoes; and it consists in certain novel features hereinafter fully set forth and claimed, the object being to produce a simpler, cheaper, and more effective device of this character than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation.

In the drawings, A represents the standard or body of the machine, on the top of which the horizontal bed B is mounted by arms *b*. A horizontal drive-shaft C is journaled on the bed at the rear. In a sleeve *d*, supported by vertical arms *f* at the rear of the machine, a vertical stub-shaft is journaled, said shaft bearing a beveled gear *g*, which meshes with a similar gear *h* on the drive-shaft. At the front of the bed B two vertical supporting-plates *i* are mounted. In bearings *j j*, respectively supported by said plates and a bracket *k* on the sleeve *d*, a horizontal rotary shaft *m* is journaled, said shaft running longitudinally of the machine. Said shaft bears a beveled gear *p*, which meshes with a similar gear *q* on the stub-shaft.

A pail-shaped tack-hopper D is fixed on the shaft *m*, said hopper being provided in its bottom with an interior gear *r*, (best shown in Fig. 14,) which is connected by an intermediate gear *t* with a pinion *v* on the shaft *m*, said gear *t* being supported by a stub-shaft *w* on the bracket *k*. Within the hopper are inwardly-projecting flanges *x*, and fastened to said shaft within said hopper there is a rotary brush *y*. The shaft *m* bears on its forward end a cam-wheel *z*, (shown in Fig. 17,) which actuates the hammer or tack mechanism of the machine. Said cam-wheel has two segmental cams 20 on its outer face, at the ends of which and between which friction-rolls 21 are disposed. The plates *i* are connected at their upper ends by a cross-bar 22 and intermediately by a laterally-arranged plate 23. A vertical plunger-bar 24 is fitted to slide in the cross-bar 22 and a sleeve 25, formed on the plate 23. Said plunger-bar is provided with an arm 26, (see Fig. 1,) which engages the cams 20 on the wheels *z* and is pushed downward by a spring 27, interposed between said cross-bar and a shoulder on said plunger. The plunger is also provided at its lower end with a beveled foot 28, on which a dovetailed block 29, provided with a hammer-bar 30, is fitted to slide.

A hollow block 31 is fitted to slide longitudinally on the bed B in suitable ways, and a connecting-rod 32, tensioned by a spring 33 within said block, is actuated by a cam 34 on the drive-shaft C. Said block has at its rear end a vertical arm 35.

The plates *i* are provided with longitudinal

ways 36, in which a cross-bar 37, mounted on friction-rolls 38, is fitted to slide. A rocking sliding cam-shaft 40 is journaled in the arm 35 and in said cross-bar 37.

Below the bed B a horizontal rack 41 is mounted. A shaft 42, journaled in lugs 43, pendent from said bed, bears a segment-gear 44 on arm 45, on which it is connected by a rod 46 with a treadle 47, (see Fig. 16,) pivoted at the foot of the machine. A torsion-spring 48 acts to reciprocate said gear when moved by said treadle. On the cam-shaft 40 a sleeve 49 is mounted, said sleeve being provided with a cam-groove 50, through which a stud or screw 51 on the shaft 40 projects, conforming the motion of said shaft to said cam as said shaft is moved by the connecting-rod 32. The cam-sleeve 49 is held by a vertical arm 53, connected with the rack 41 and forked to astride a groove 54 in said sleeve, as best shown in Figs. 6 and 7.

The crimping-wheel E is mounted on the outer end of the shaft 40, said wheel being provided with a series of graded flutes or indentations 55 in the edge of its outer face, as best shown in Fig. 10. The rear face of the wheel is recessed or provided with an undercut groove 56. Pivoted levers 57 on a cross-bar 58, secured to the forward end of the shaft 40, project into said grooves 56 and support the crimping-wheel E. A screw-sleeve 59 is mounted on said shaft 40, and a nut 60 (see Fig. 3) is turned onto said sleeve. The inner ends of the levers 57 project into said nut, which is recessed at 61 to receive them. By turning said nut the levers 57 may be spread or released to loosen or clamp said crimping-wheel. The lever 65 (see Fig. 1) is pivoted to one of the vertical plates *i*. A sectional rod 66 is pivoted to the lever 65, the sections thereof being connected by a nut 67, whereby they may be adjusted. The rear end of the lever 66 is forked to astride the shaft C and is actuated by a cam 68 on the inner face of the beveled gear *h*, said cam being best shown in Fig. 9, in the track 69 of which a projection on said lever works. The outer end of the lever 65 is slotted at 70, and a horizontally-arranged angle-lever 71, having a pin projecting through said slot, passes through the front plate 23 and vertically downward at 72. A horizontal shaft 75 is mounted in the lower end of the lever 71 (see Fig. 8) in alignment with an axial opening 76 in the crimping-wheel E. On said shaft a serrated clamping finger or claw 77 is mounted, and secured vertically to said finger there is a "feeler" 78, adapted to enter one of the flutes 55 on said wheel and center the finger. On the shaft 75 an arm 80 is mounted and is engaged at opposite sides by centering-springs 81, secured to the lever 71. From the front plate 23 a guard or rest 82 for the shoe projects vertically downward beside the clamping-finger. A vertical arm 85, secured to the sliding box 31, supports the tack-chute 86. Said chute projects through an opening 87 in the front of the hopper D, and has a tack-track 88, (see Fig. 15,) which is passed laterally by the brush *y*. The inner end of the chute is provided with vertically-curved runs 89 for conducting tacks to said grooves as they fall from the wings or flanges *x* in the rotating hopper. At the lower end of the chute and directly behind the crimping-wheel the tack-holder and separating mechanism H (see Figs. 5, 11, 12, and 13) are disposed. This mechanism comprises a horizontal plate 90, from which the holder 91 is pendent between the crimping-wheel clamps 57. Said plate has an opening 92, Fig. 11, through which the hammer-bar 30 plays. Across the mouth of the chute a separator-bar 95 plays, said bar being actuated as the chute is reciprocated, as hereinafter described, by a roll 96 thereon engaging a cam-bar 97, (see Fig. 11,) secured to a standard *i*, said roll being retained by a spring 98, secured to said standard. The separator-bar 95 is provided on its bottom with a longitudinally-arranged cut-off plate 99, at the inner end of which an approximately-**V**-shaped tack-way 100 (shown in Fig. 13) is formed. The mouth 101 of said way is adapted to register with the mouth of the chute 86, and at the side of said mouth opposite the cut-off plate a yielding finger or spring 102 is secured. The purpose of said spring is to compensate for variation in the size of tacks centering said way. The tack-holder 91 (see Fig. 5) is provided with an opening 103 for the hammer-bar 30 in alignment with the opening 92 in the plate 90. In the bottom of said opening two spreading-blocks 104 are disposed and cushioned laterally by springs 105, secured to the body of said holder. A vertically-inclined duct 106 in the holder leads into the opening 103 above the blocks 104, its upper end being in position to register with the discharge 107 of the **V**-way 100 in the separator-bar 95. A spring-clutch mechanism K, of any suitable construction locks the pulley 110 to the drive-shaft, and is connected by a rod 111 with a treadle 112, whereby said pulley may be released, as described. The tension of the connecting-rod spring 33 in the sliding box 31 may be adjusted by a nut 115.

In use the hopper D is rotated on the shaft *m* by its connecting-gears. Tacks therein are directed by the plates 89 onto the chute 86, and a portion fall point downward into the groove 88. The remainder are thrown back into the hopper by the brush *y*. The chute is reciprocated as the box 31 is driven by the connecting-rod. As the chute advances, the separator-bar is driven from right to left, as viewed in Fig. 1, and a tack from the chute enters the mouth of the **V**-way as they register. On the return of the chute the bar 95 is driven in the opposite direction, the cut-off plate 99 closing the mouth of the chute and the tack in the **V**-way entering the other arm 107 thereof, from which it is discharged into

the holder-duct 106. Through said duct it drops between the spring-pressed holder-blocks 104, by which it is supported until struck by the hammer-bar 30. The last is held against the rest 82, the edge of the upper being disposed by the operator between the crimping-wheel E and the clamping-finger 77. Said finger is drawn back by its cam-actuated levers into engagement with the crimping-wheel and clamping the upper thereto. The stud 75 enters the opening 76 in said wheel and its feeler 78, engaging a flute 55, rides over said wheel, at the same time directing the finger 77 into an opposite flute. The cam-sleeve 49, being in the position shown in Fig. 6, the projection 51 on the shaft 40 reciprocates in the straight portion thereof. The cam-actuated connecting-rod driving the block 31 forward carries with it the shaft 40, which drives the crimping-wheel forward and draws the upper tightly onto the last. The tack-holder advances conjointly therewith. The cam 20 on the shaft *m* has meanwhile forced the plunger 24 upward, and is so timed that when the holder has advanced, as described, said plunger is released and driven downward by its spring 27. The tack is thus driven downward between the holder-blocks 104 onto the last. The shaft 40 reciprocating releases the upper, the last being removed by the operator to enable a new hold to be taken by the serrated finger and crimping-wheel. By depressing the lever 47 the segment 44 is moved, throwing the rack 41 and sliding the cam 49, so that the shaft projection 51 plays in the inclined portion of its track 50. A rocking motion is thus imparted to the shaft 40 as it is reciprocated longitudinally, causing the crimping-wheel to more closely gather or plait the upper, and is employed especially in lasting the toe and heel portions. The flutes at the lower portion only of the wheel are in action. Said flutes being graded in size, as described, by changing the position of the wheel on its levers 57 flutes suitable to various qualities of work may readily be brought into position. By pivoting the finger 77 on the shaft 75 sufficient play is afforded to enable it to slide laterally into the flutes. The crimping-wheel and actuating mechanism are cushioned by the tension-spring 33 to prevent them from tearing the leather.

In the tack-separator the construction of the V-way and cut-off plate render it practically impossible for more than a single tack to enter the holder, at the same time preventing choking of the same and imperfect work.

Having thus explained my invention, what I claim is—

1. In a lasting-machine, a fluted crimping-wheel mounted on a longitudinally-reciprocating shaft and mechanism, substantially as specified, for clamping the upper against said wheel.

2. In a lasting-machine, the fluted crimping-wheel and clamping-finger, in combination with mechanism for conjointly actuating said finger and wheel, substantially as described.

3. In a lasting-machine, the combination of a shaft journaled on the frame, a crimping-wheel thereon, mechanism for reciprocating said shaft longitudinally, a sleeve on the shaft provided with a cam-groove, adjusting mechanism for said sleeve, and a projection on said shaft working in said groove, substantially as and for the purpose set forth.

4. In a lasting-machine, a fluted crimping-wheel and mechanism for reciprocating the same, in combination with a pivoted clamping-finger and mechanism for forcing said finger into engagement with said wheel, substantially as set forth.

5. In a lasting-machine, the fluted crimping-wheel E and shaft, in combination with the drive-shaft and the spring-tensioned connecting-shaft whereby said crimping-shaft may be reciprocated longitudinally, as described.

6. The combination of the drive-shaft and spring-tensioned connecting-rod with the sliding crimping-shaft, the crimping-wheel, the pincher and actuating mechanism, the cam-sleeve and shaft projection, and treadle-actuated mechanism for adjusting said cam-sleeve, substantially as set forth.

7. The reciprocating crimper-shaft, in combination with the fluted crimping-wheel E, provided with grooves 56, the clamping-levers 57, and locking mechanism, substantially as described.

8. In a lasting-machine, a spring-tensioned shaft and mechanism for reciprocating the same longitudinally, in combination with a cam-sleeve on said shaft, a shaft projection working in a cam-groove on said sleeve, a crimping-wheel on said shaft, a pincher actuated conjointly therewith, a treadle-actuated sector-gear, and a sliding rack meshing therewith and secured to said sleeve, substantially as described.

9. In a lasting-machine, the drive-shaft, in combination with the pivoted finger 77 and feeler-spring 78, and a cam-actuated series of levers pivoted to the machine-frame and connecting said shaft and finger, substantially as set forth.

10. The drive-shaft, sliding block, and spring-tensioned connecting-rod, in combination with the shaft 40, mounted on said block and provided with the projection 51, the non-rotatable cam-sleeve 49 on said shaft, adjusting mechanism therefor, and a detachable crimping-wheel mounted on said shaft, substantially as described.

11. In a lasting-machine, the spring-pushed hammer-plunger, in combination with a rotary shaft, a cam-wheel mounted thereon, segmental cams on said wheel for elevating said plunger, and friction-wheels interposed between said cam, substantially as described.

12. In a lasting-machine, the hammer-

wheel *z*, provided with segmental cams, as 20, and friction-rolls 21, in combination with the shaft *m* and the spring-pushed plunger-bar provided with a projection for engaging said cams, arranged substantially as set forth.

13. The fluted crimping-wheel E, in combination with the shaft 40, provided with the screw 59, the recessed nut 60, and the clamping-levers 57, pivoted on said shaft and locked by said nut, substantially as described.

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