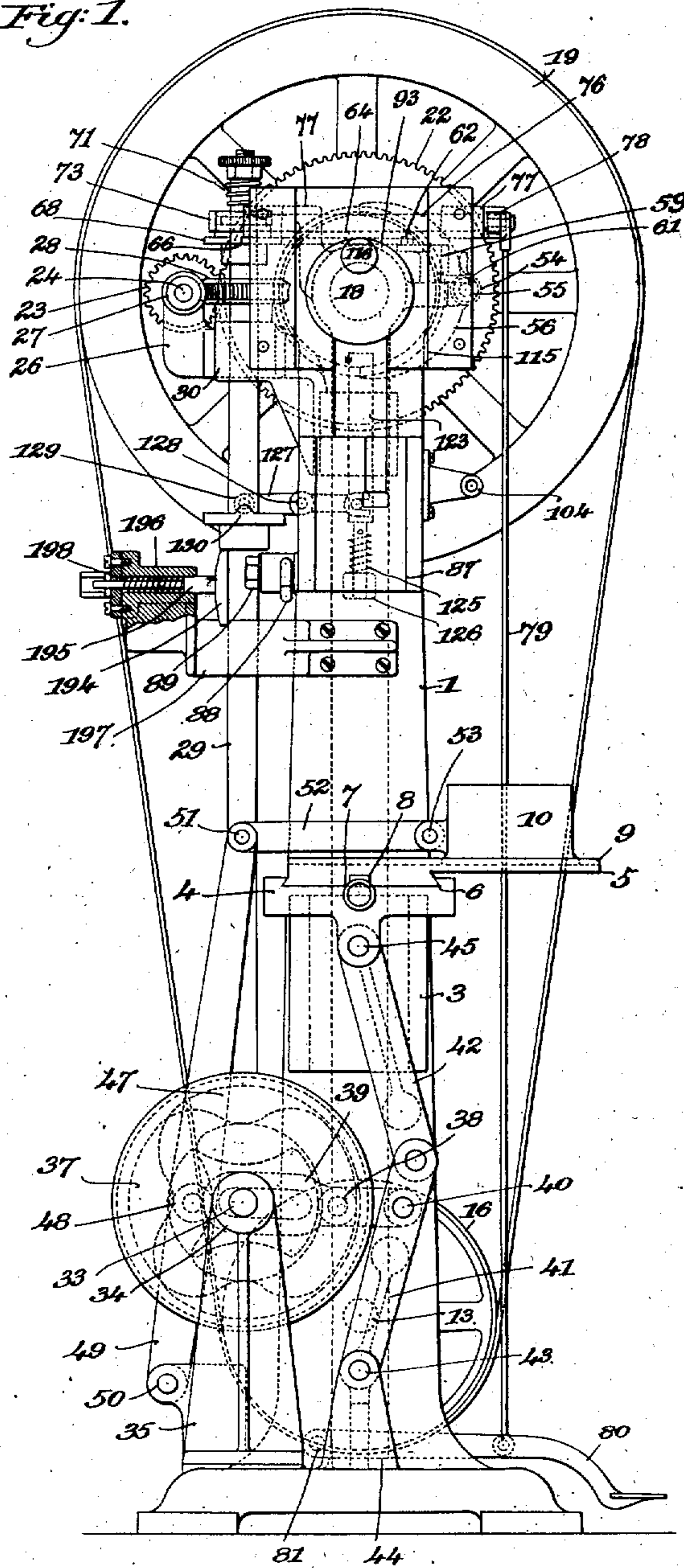


HEEL NAILING MACHINE.

Patented Dec. 20, 1910.

8 SHEETS--SHEET 1.

Fig: 1.



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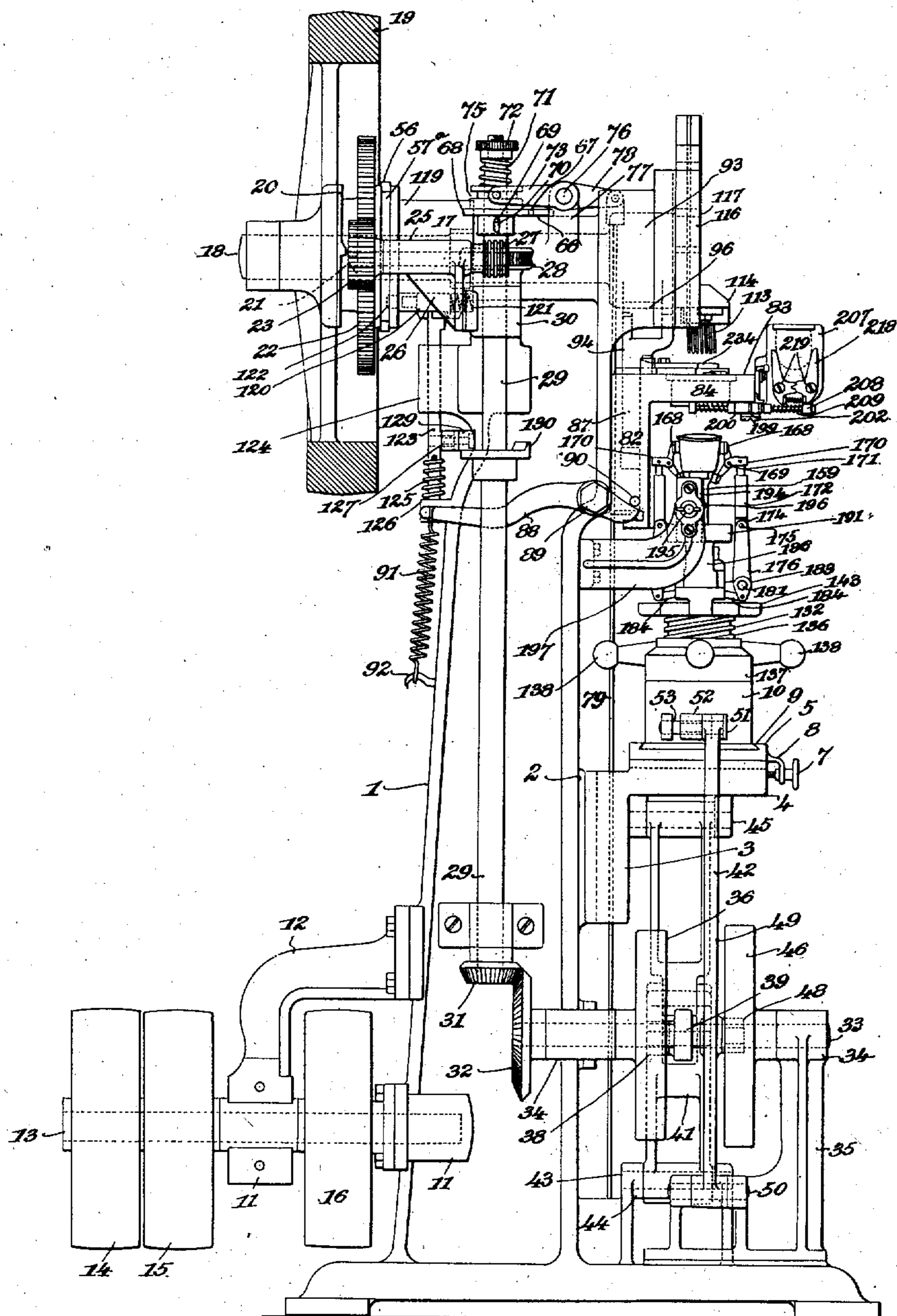
E. E. WINKLEY.
HEEL NAILING MACHINE.
APPLICATION FILED AUG. 12, 1899.

979,237.

Patented Dec. 20, 1910.

8 SHEETS-SHEET 2.

Fig. 2.



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979,237.

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HEEL NAILING MACHINE.
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Patented Dec. 20, 1910.

8 SHEETS—SHEET 4.

Fig. 4

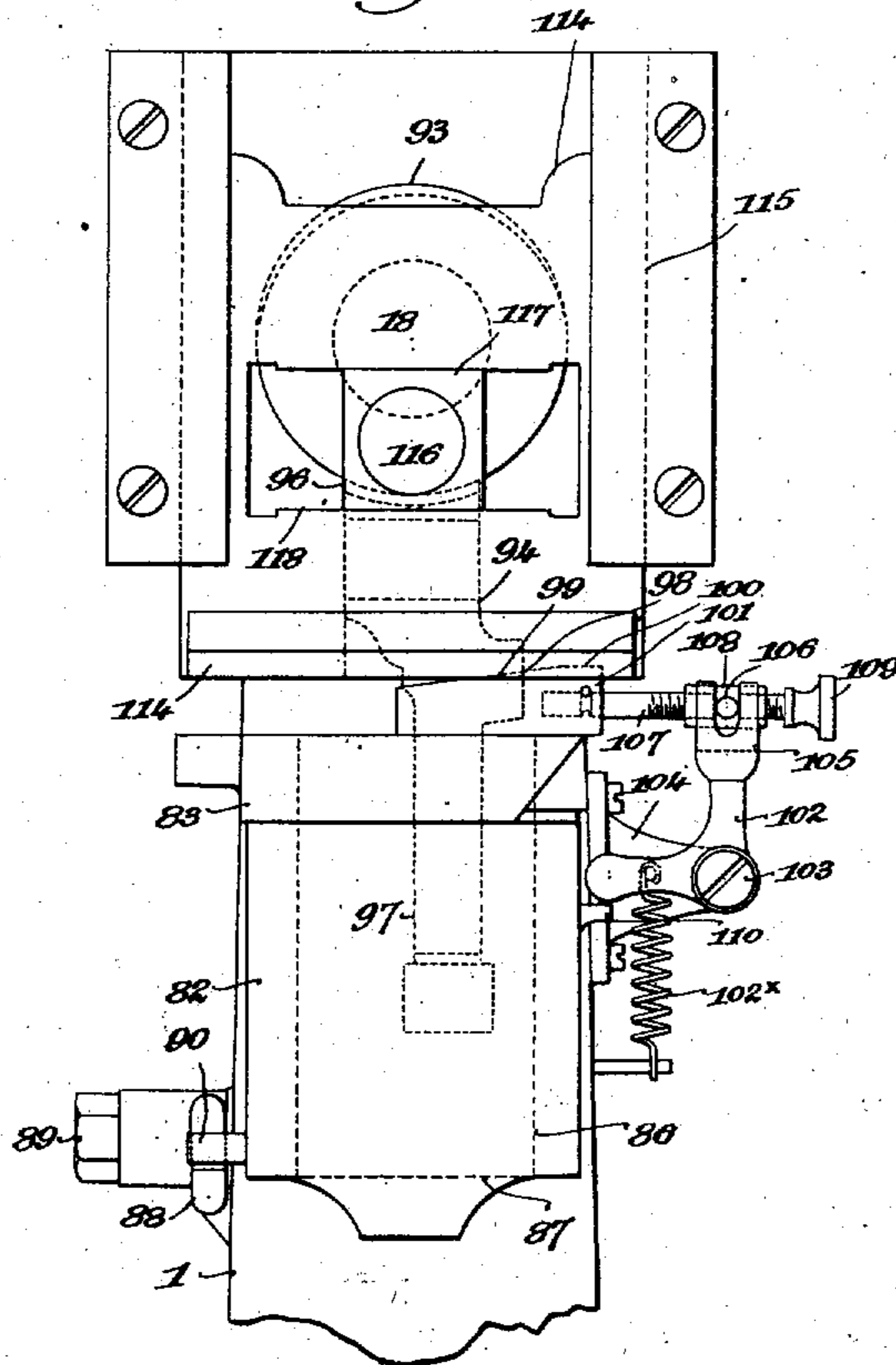
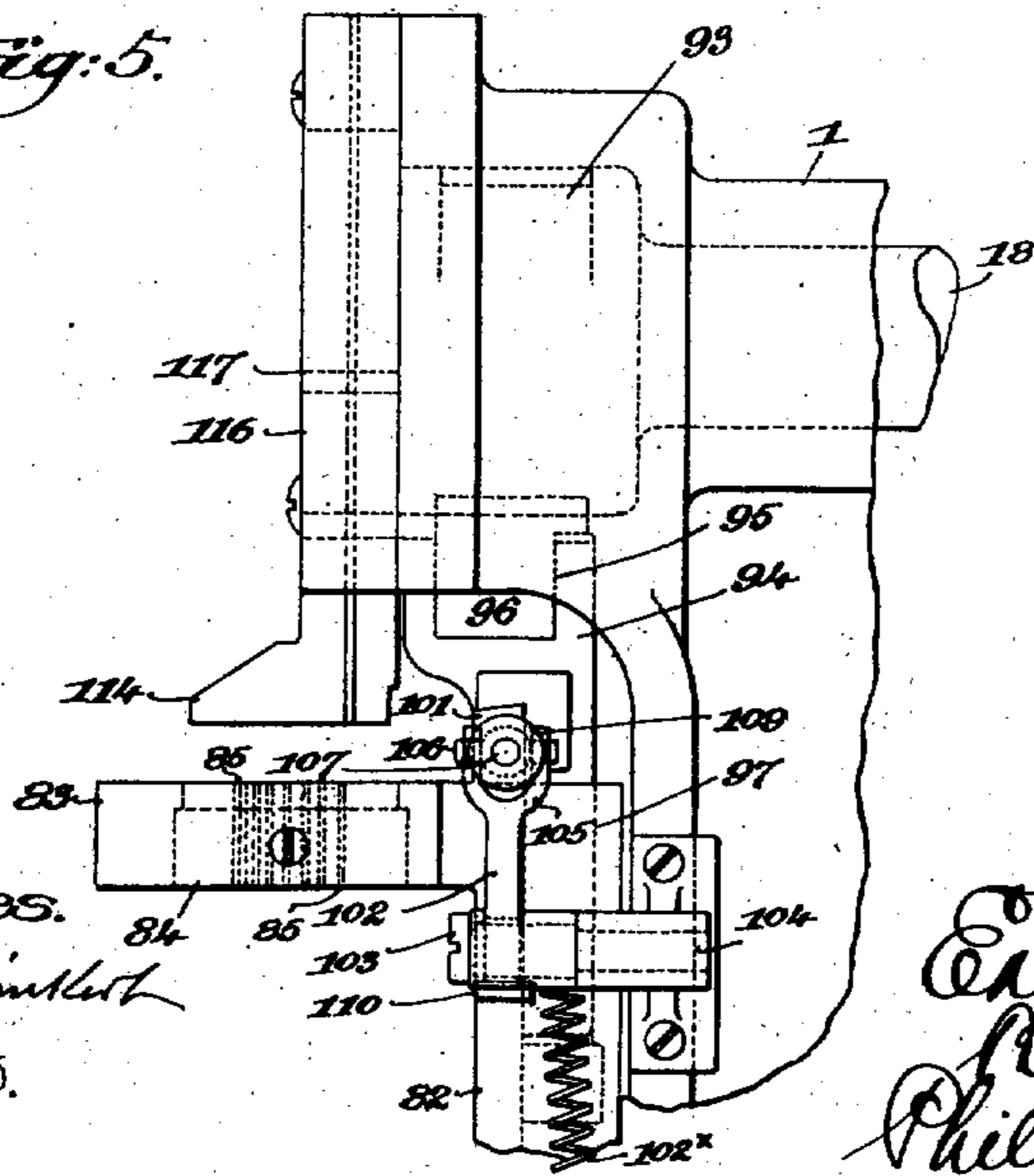


Fig. 5



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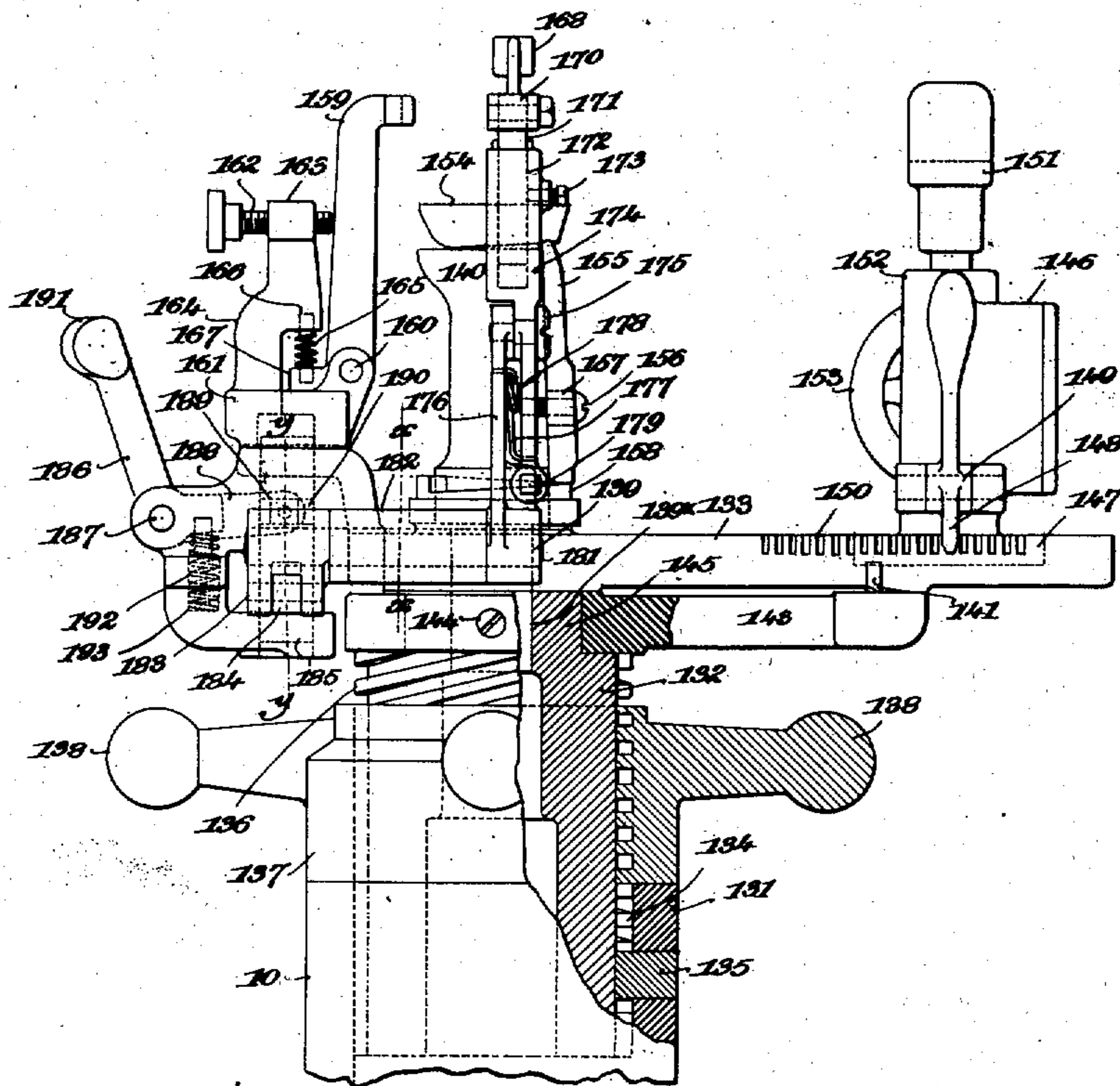
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8 SHEETS—SHEET 5.

Fig. 6.



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APPLICATION FILED AUG. 12, 1899.

979,237.

Patented Dec. 20, 1910.

8 SHEETS—SHEET 6.

Fig. 7.

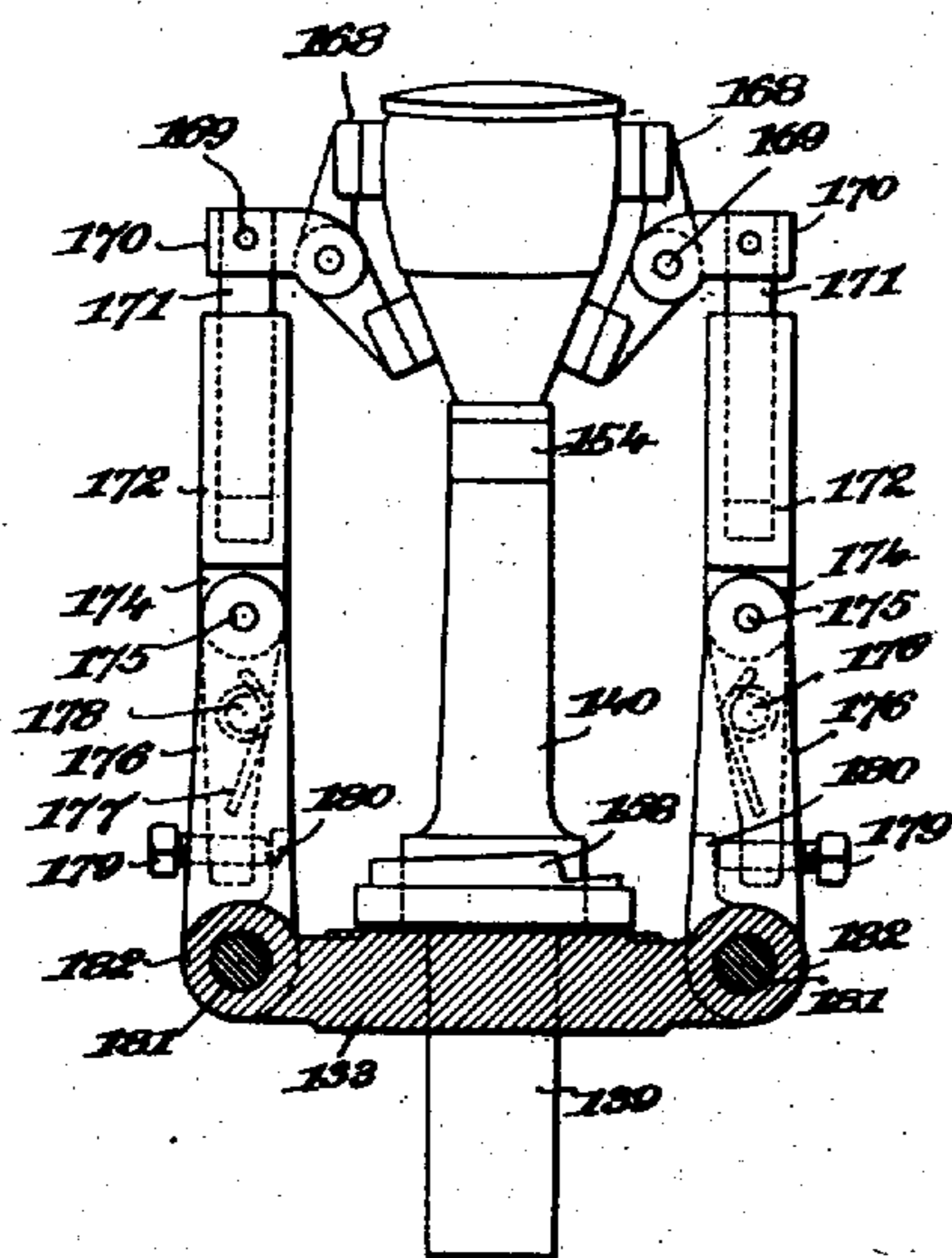


Fig. 8.

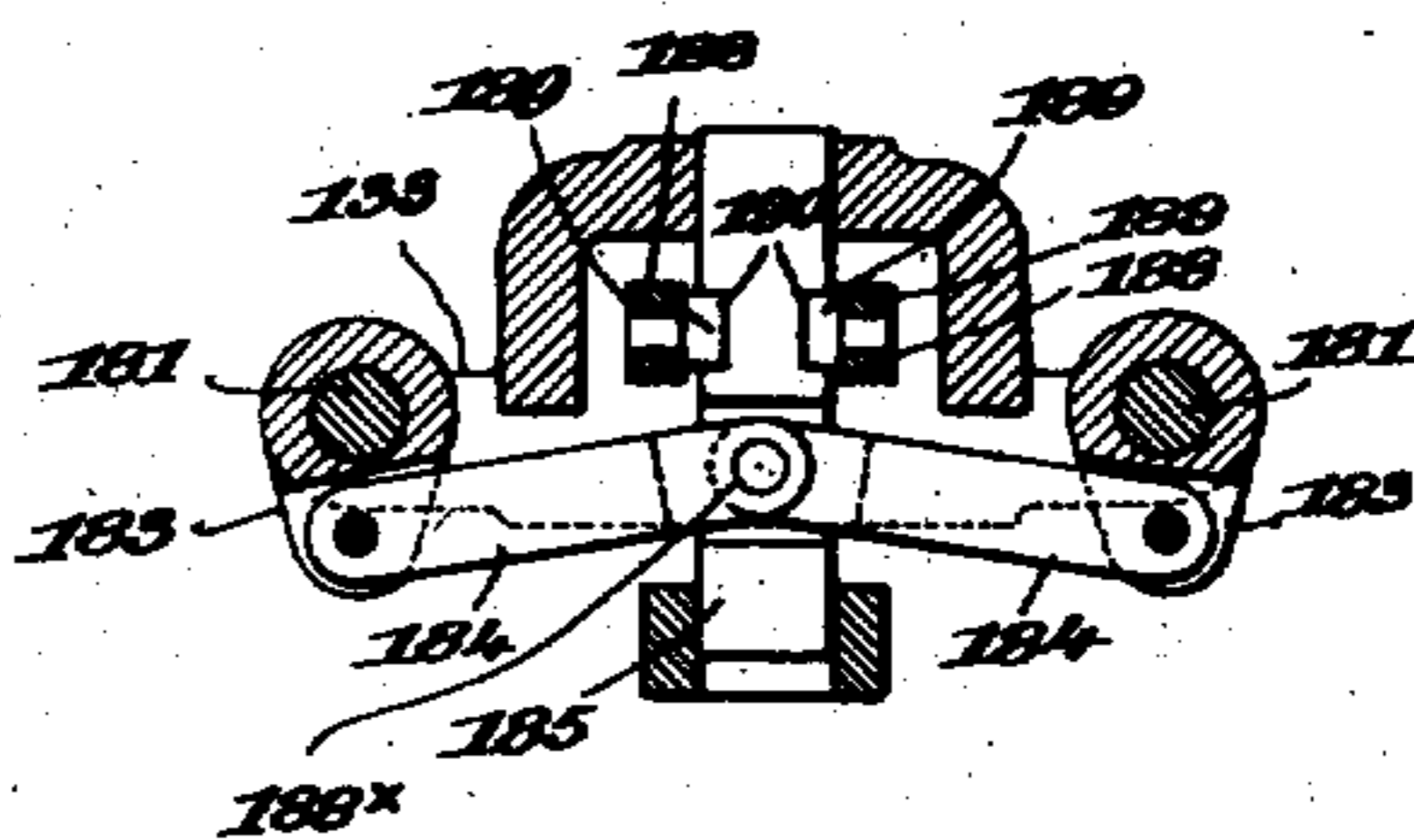


Fig. 9.

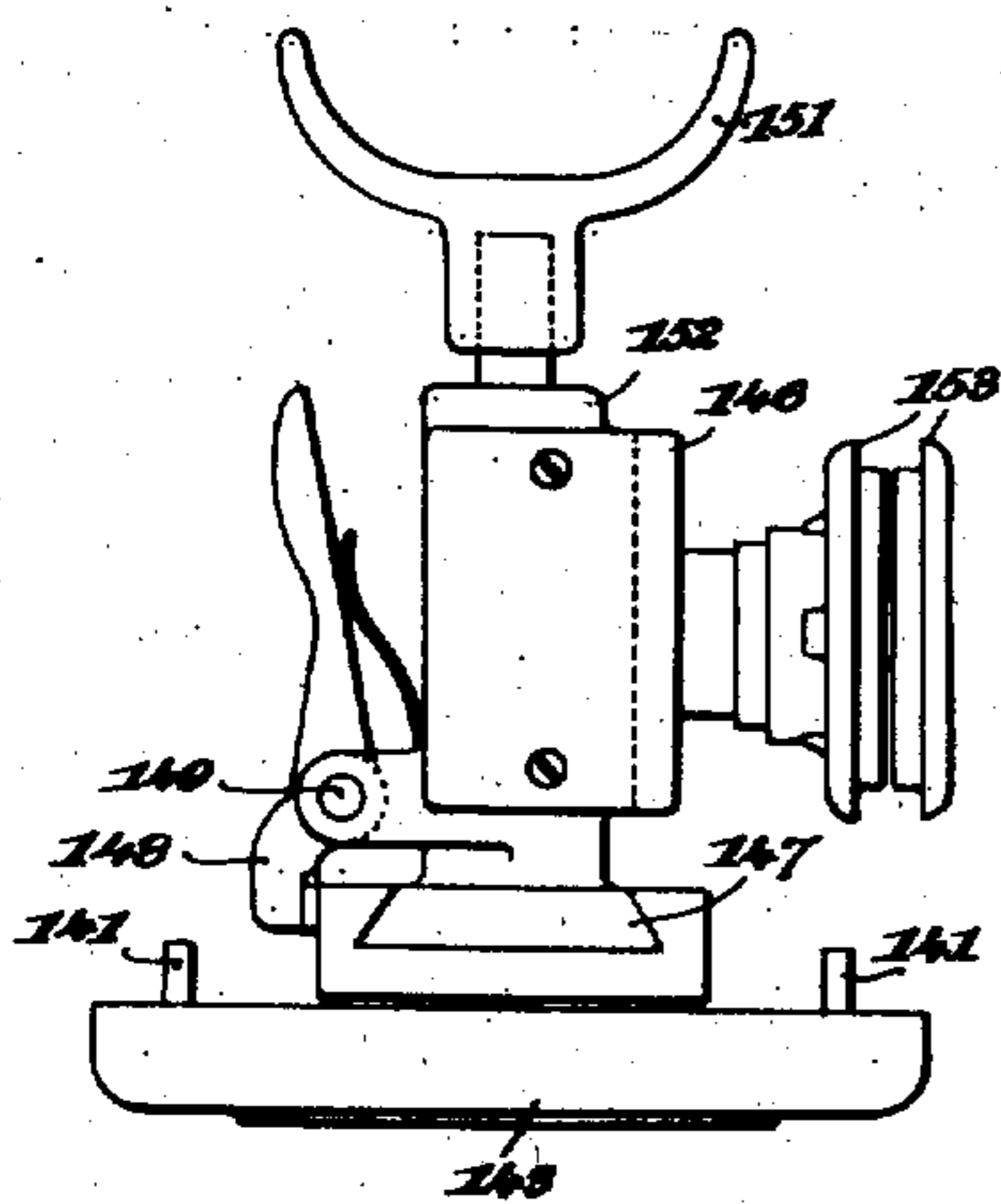
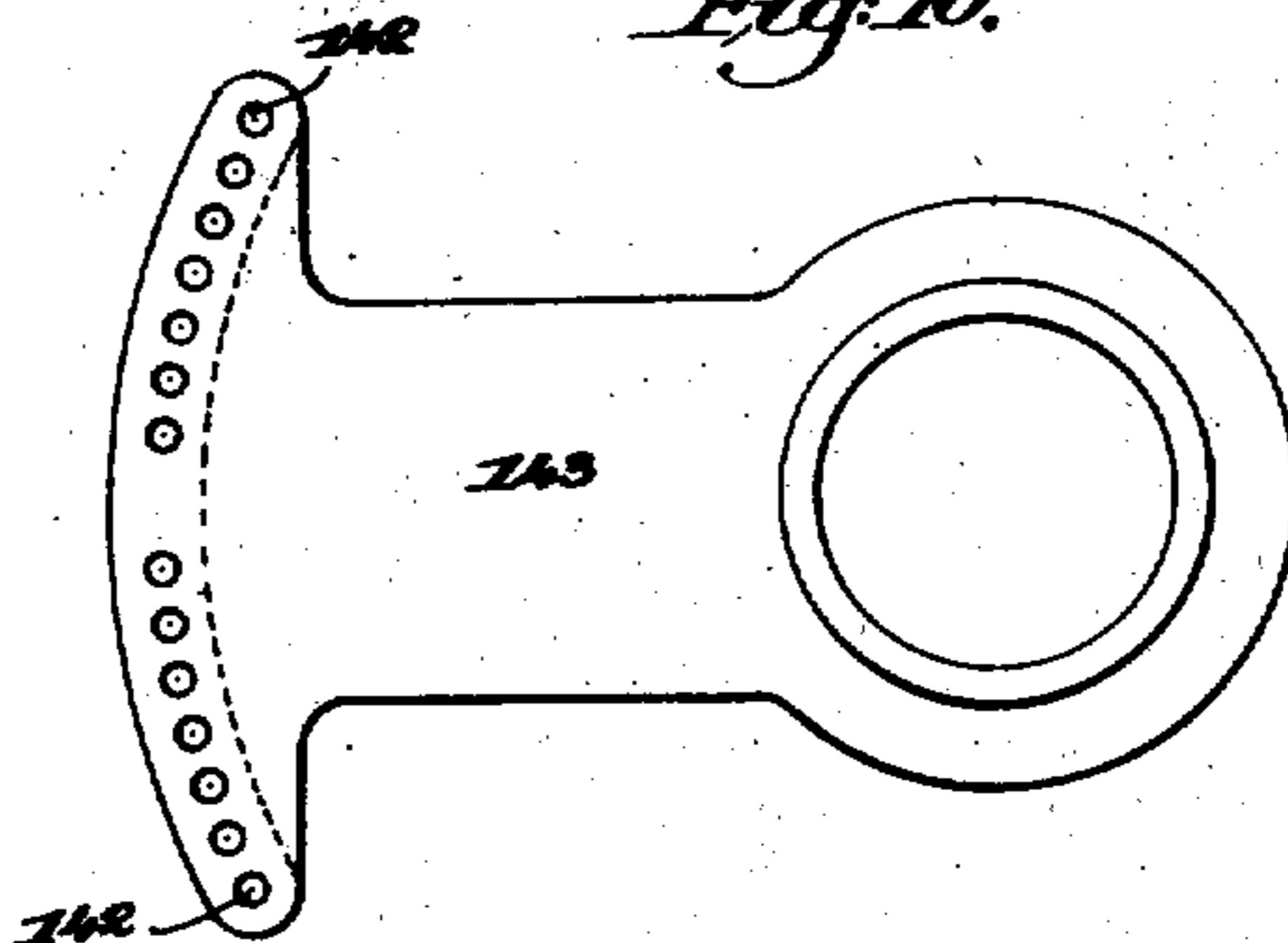


Fig. 10.



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Patented Dec. 20, 1910.

8 SHEETS-SHEET 7.

Fig. 11.

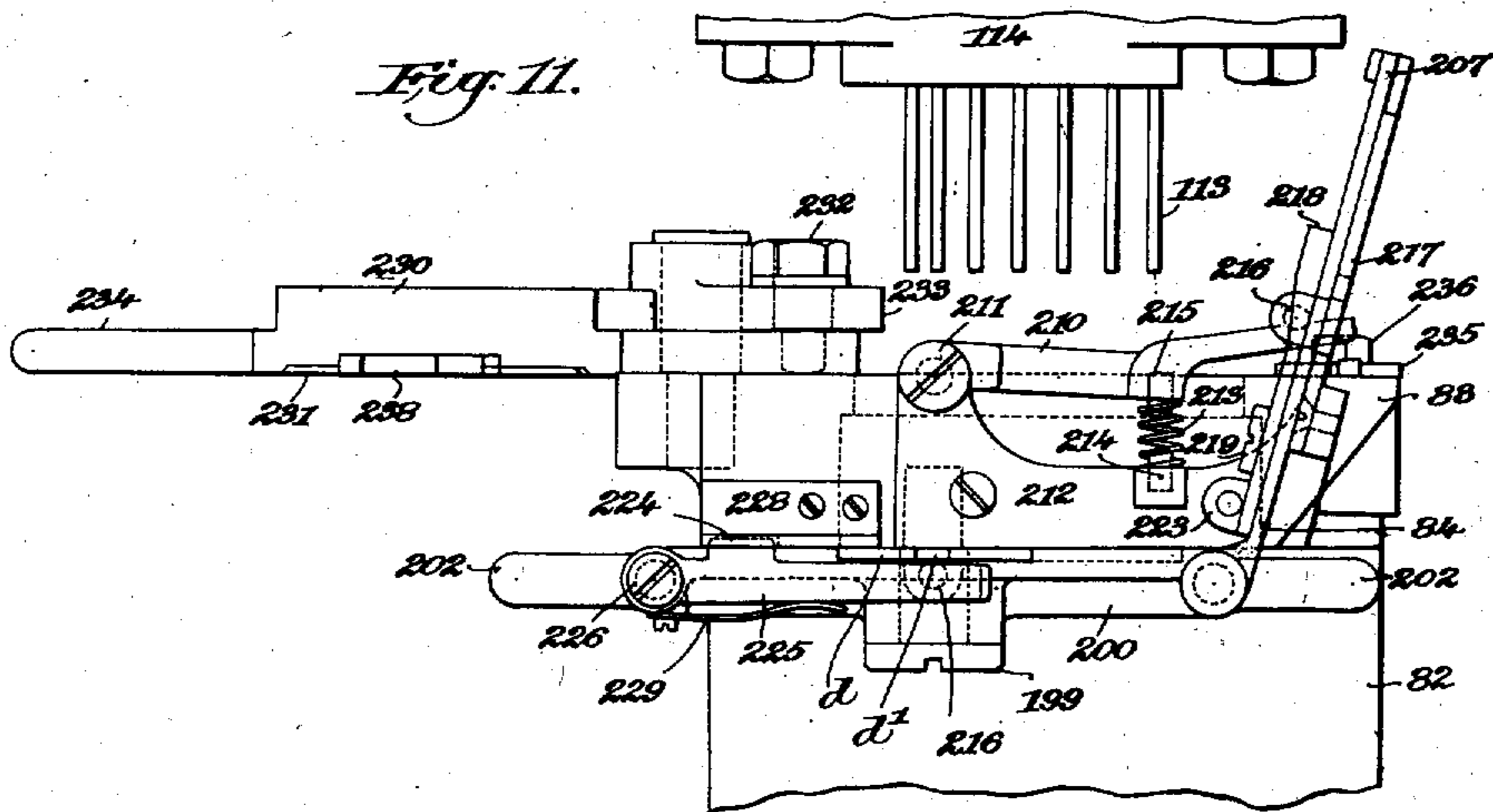
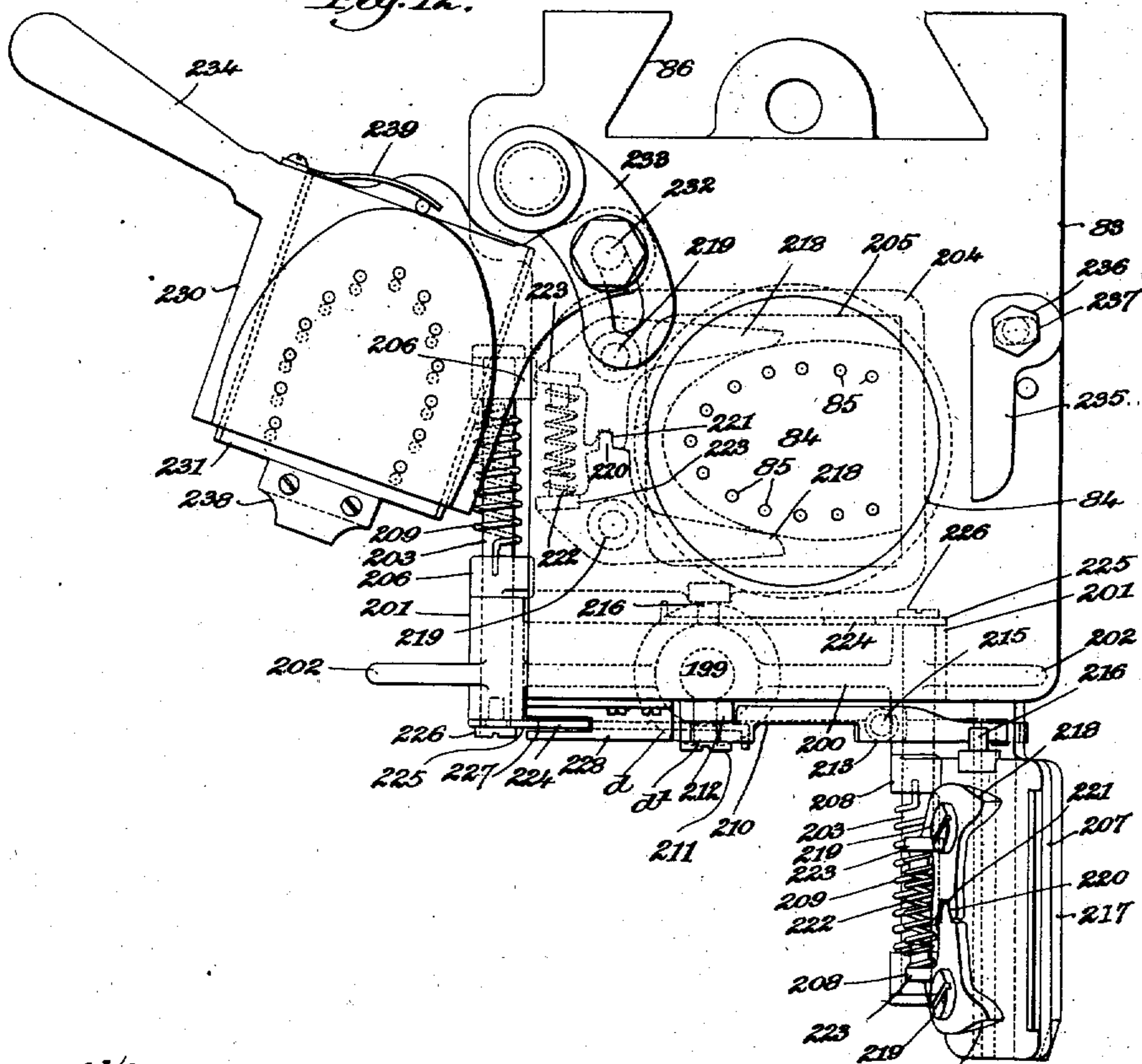


Fig. 12.



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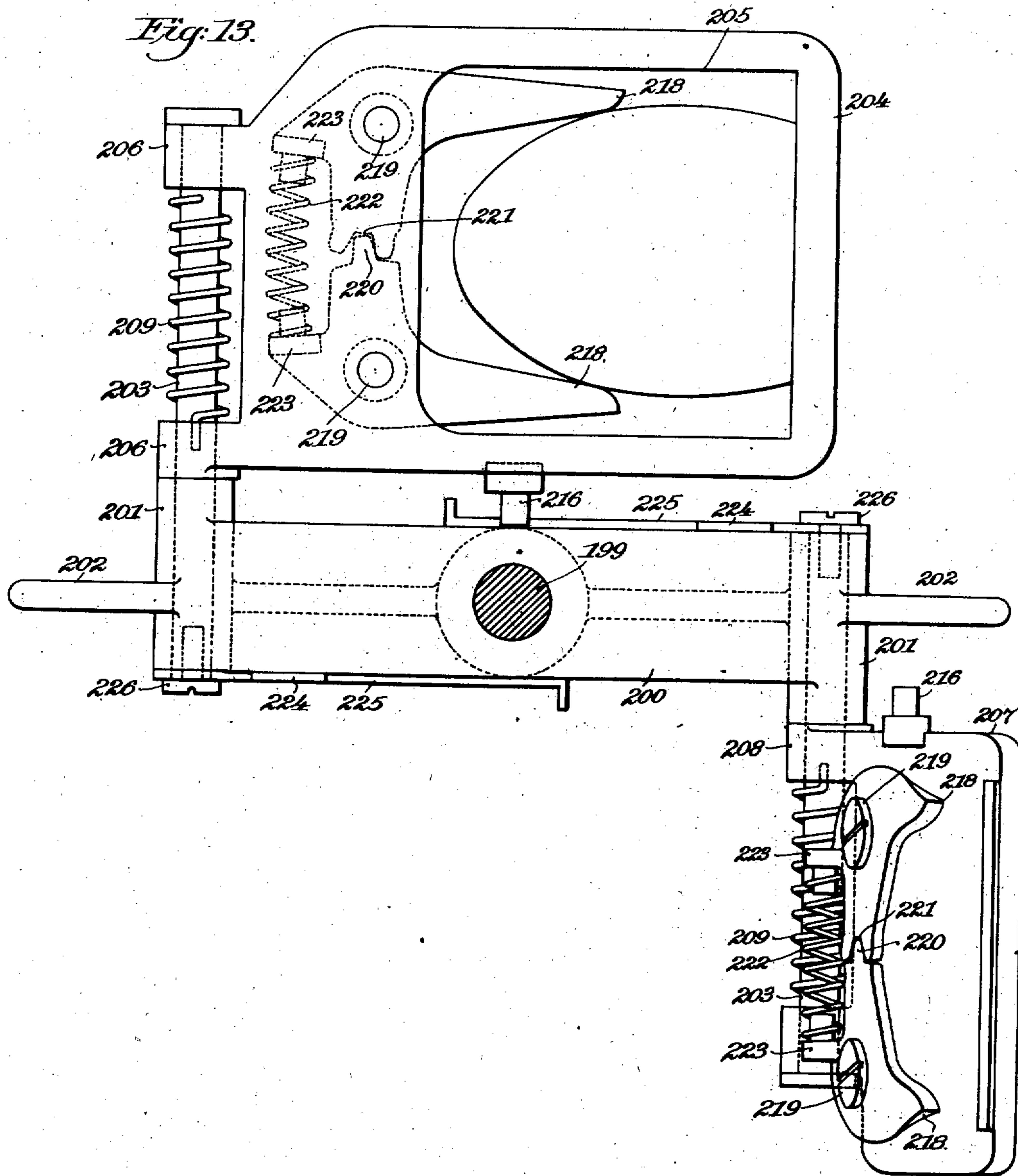
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APPLICATION FILED AUG. 12, 1898.

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UNITED STATES PATENT OFFICE.

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HEEL-NAILING MACHINE.

979,237.

Specification of Letters Patent.

Patented Dec. 20, 1910.

Application filed August 12, 1899. Serial No. 726,999.

To all whom it may concern:

Be it known that I, ERASTUS E. WINKLEY, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Heel-Nailing Machines; and I do hereby declare the following to be 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.

The present invention relates to machines for attaching heels to boots and shoes of that type in which the heels are secured by nails driven through the heel from the outside and clenched into the heel seat of the insole, and particularly to improvements in the construction, organization and mode of operation, of the heel attaching machine disclosed in Letters Patent of the United States No. 304,153, dated August 23, 1884.

The object of the present invention is to improve the operation of machines of this type, by rendering the same more automatic, particularly with regard to the positioning of the jack and shoe with relation to the heel compressing and nailing devices; to improve the clamping devices which center the jack and shoe, and render them automatic in operation; to provide automatically operating means to regulate the pressure applied to the heel in accordance with the height of said heel, and in other particulars to be hereinafter set forth, and generally improve the operation of said machine.

To the above end, the present invention consists of the devices and combinations of devices which will be hereinafter set forth and claimed.

The present invention is illustrated in the accompanying drawings in which—

Figure 1 shows a front elevation of the machine with the jack and certain other parts omitted for the sake of clearness, and other parts shown in section. Fig. 2 shows the machine in side elevation looking toward the right of Fig. 1, with the pulley on the shaft which operates the heel compressing and nailing devices in section, to show underlying parts, this view also showing the jack and the holders for the heel and top-lift. Fig. 3 shows a top plan view of the machine, certain parts being omitted, and

with the pulley on the shaft which operates the heel compressing and nailing devices in section. Fig. 4 shows in front elevation a portion of the upper part of the machine, illustrating the mechanism for actuating the templet carrier and the means for securing the automatic regulation of the pressure on the heel. Fig. 5 shows in side elevation the same mechanism as shown in Fig. 4, with the lower part broken away, looking toward the left of Fig. 4. Fig. 6 shows in side elevation and partial section, the jack and mechanism for adjusting the same vertically. Fig. 7 shows the last clamping and the centering devices, the same being a section taken on the line $x-x$ in Fig. 6, looking toward the right. Fig. 8 shows portions of the actuating mechanism for the shoe centering and clamping devices shown in section taken on the line $y-y$ Fig. 6. Figs. 9 and 10 show details of the jack mechanism to be hereinafter referred to. Fig. 11 shows in front elevation the nail block or templet carrier, with the heel and top-lift holders mounted thereon; this figure also showing relative position of the nail block and nail drivers. Fig. 12 shows a top plan view of the nail block or templet carrier, and the heel and top-lift holder, the heel holder being shown in dotted lines in the position which it occupies when supporting the heel beneath the nail block or templet; and the top-lift holder in the position which it occupies for the insertion of the top-lift therein. Fig. 13 is a plan view of the heel and top-lift holders and the carrier therefor, the holders being in the same position as in Fig. 12.

Similar reference characters will be employed to designate corresponding parts throughout the specification and drawing.

In the present invention, there is provided mechanism for automatically moving the jack with the shoe thereon from a position to one side of and out of alinement with the heel compressing and attaching instrumentalities, in which position the jack is in convenient location for the removal of a shoe therefrom and the placing of another shoe thereon, to a position which will place the heel of the shoe in line with the heel compressing and attaching devices, and also automatic mechanism whereby after the jack has been moved as described to place the heel

end of the shoe in alinement with the compressing and attaching devices, to move said jack and heel compressing devices relatively to each other to place the heel end of the shoe in contact with the heel and to thereafter actuate such devices to compress the heel and spank on the top-lift, such relative movement to place the shoe in contact with the heel, in the machine of the drawing, being secured by imparting movement to the jack toward the heel compressing devices, and the relative compressing movement to compress the heel being secured by a movement of the compressing devices toward the jack, and this automatic positioning of the jack and shoe, and the relative movements of the jack and heel compressing, and top-lift attaching devices are secured by the mechanism which will now be described, such mechanism, as will appear hereinafter, being preferably constructed and arranged to impart two reciprocations to the jack, for the purpose of attaching the heel and top-lift, while the jack positioning mechanism maintains the jack in line with the heel compressing and attaching devices, after which the jack will be automatically moved out of alinement with such devices in position for the removal of the shoe the heel of which has been attached, and the replacing of another shoe thereon.

In the drawings 1 represents the main frame, comprising a vertically disposed standard supported on a suitable base, said frame being of a height, and of a size and shape to support the moving parts of the machine, and to bring the jack and other instrumentalities at such a height as to be convenient for the operator. Mounted on the front of the frame so as to have a vertical reciprocation on a suitable dove-tail, or other form of guide 2, is a plate or carrier 3, carrying at its upper end a bed or table 4, which supports the jack carrier plate 5, the jack carrier plate 5 being preferably mounted for a horizontal adjustment in a dove-tail guideway 6 formed in the upper surface of the bed or table 4, and adjusted toward and from the standard or frame 1, by means of a screw 7 carried by a bracket 8 of the jack carrier plate 5, and engaging a threaded aperture (not shown) in the bed or table 4, the arrangement being such that the jack carrier plate 5 may be adjusted to a limited degree toward and from the front of the frame 1, if necessary to secure the proper positioning of the jack with relation to the heel attaching and compressing instrumentalities. The jack carrier plate 5 is extended to one side of the bed or table 4 as shown in Fig. 1 of the drawing, and in its upper surface is provided with preferably a dove-tail guideway 9 in which is fitted the base of the jack carrier 10, and along which the jack carrier is ar-

ranged to slide for the purpose of moving the jack carrier with the jack thereon from the position shown in Fig. 1, in which position the jack and shoe will be out of alinement with the heel compressing and attaching devices, to the left as the machine is shown in Fig. 1, to place the heel of the shoe on the jack in alinement with the heel compressing and attaching devices. The vertical movement of the bed or table 4 raises the jack carrier for the purpose of placing the heel seat of the shoe sole in contact with the heel or top-lift supported beneath the nail block or templet, to be described, and the horizontal movement of the jack carrier secures the movement of the jack and shoe into and out of alinement with the heel compressing and attaching devices, as hereinbefore described, and these movements of the bed or table 4 and the jack carrier 10 are, in the machine of the drawings, secured in the following manner:—Mounted in suitable bearings 11 formed in the frame 1 and in a bracket 12 secured to the rear of the frame 1, is a driving shaft 13, upon which are mounted suitable fast and loose pulleys 14 and 15 by which said shaft is driven by a belt from any suitable source of power, and said shaft 13 carries a pulley 16 fixedly secured thereto. The frame 1 at its upper end or head carries a horizontally disposed bearing 17 in which is supported to rotate the shaft 18 which operates the nail block or templet carrier, together with the nail drivers, as will be hereinafter described.

Loosely mounted upon the shaft 18 is a pulley 19 which carries a clutch face 20 arranged to coöperate with a clutch face 21 carried by the gear 22, which gear is arranged to turn loosely on the shaft 18 and to have a sliding movement along said shaft toward and from the pulley 19, for the purpose of connecting and dis-connecting the complementary clutch faces 20 and 21 of said pulley and gear. The pulley 19 is arranged to be constantly driven by a belt from the belt pulley 16, and when the complementary clutch faces 20 and 21 are coupled together, the gear 22 will partake of the rotary movement of the pulley 19. The gear 22 meshes with and drives a pinion 23 carried by a shaft 24 mounted in a bearing 25 supported by a bracket 26 secured to the side of the frame 1. Shaft 24 at its opposite end carries a worm 27, which meshes with and drives a worm gear 28, secured near the upper end of a vertical shaft 29, arranged to rotate in suitable bearings 30 secured to the side of the frame 1. The shaft 29 at its lower end carries a bevel gear 31, which meshes with a bevel gear 32 secured to a horizontally disposed shaft 33, arranged to rotate in suitable bearings 34 carried by the frame 1, and a vertical stand-

ard 35 projecting upwardly from the base of the frame as clearly shown in Figs. 1 and 2.

Fixedly mounted upon shaft 33 is a cam 36 provided with a cam groove 37 in which is fitted a cam roll 38 carried by a link 39, which link is slotted as shown and embraces the shaft 33 for the purpose of being properly guided, and said link at its opposite end is pivotally connected at 40, to one member 41 of the toggle levers 41 and 42, the member 41 of the toggle levers being pivoted at 43 to a standard 44 rising from the base of the machine, the member 42 being pivotally connected at 45 to the under side of the bed or table 4. The shaft 33 also carries a cam 46 having a cam groove 47 in which is fitted a cam roll 48 carried by a lever 49 fulcrumed at 50, to the base of the machine, and which at its upper end is pivotally connected at 51 to a link 52, which link is pivotally connected at 53 to the jack carrier 10, the pivotal connection being such as to permit the horizontal adjustment of the jack carrier plate 5 which has been described (see Fig. 2).

The arrangement just described is such, that when the clutch faces 20 and 21 are coupled together, the rotations of the pulley 19 will be communicated to the gear 22 which will in turn drive the pinion 23, and through the shaft 24, worm 27 and worm gear 28, rotate the vertical shaft 29, which through the bevel gears 31 and 32 rotates the cam shaft 33, and the cams 36 and 46, and such cams will, by means of the lever 49, impart horizontal reciprocations to the jack carrier 10 for the purpose of moving the jack into and out of alinement with the heel compressing and attaching devices, and will by means of the toggle levers 41 and 42 impart vertical reciprocations to the bed 4 and the jack supported thereon, and the cams 36 and 46 are so constructed that the horizontal and vertical movements of the jack carrier will be so timed with relation to each other, that prior to the engagement of the heel seat of the boot or shoe with the heel supported by the heel holder beneath the templet, the horizontal movement of the jack carrier will have placed the heel seat of the shoe in direct alinement with the heel compressing and attaching devices, after which the toggle levers 41 and 42 will complete the upward movement of the jack to place the shoe in contact with the heel, and for the purpose of attaching the heel and spanking on the top-lift, while the jack remains beneath the heel compressing and attaching devices, the jack will have two vertical reciprocations to one horizontal reciprocation.

I have provided suitable mechanism under the control of the operator for moving the gear 22 along the shaft 18 toward the pul-

ley 19 for the purpose of coupling the complementary clutch faces 20 and 21, and I have also so constructed the clutch controlling mechanism, that after the gear 28 shall have made one complete rotation, to impart one cycle of operation to the mechanism actuated thereby, the gear 22 will be automatically moved away from the pulley 19 to disconnect the clutch faces 20 and 21, thus stopping the operation of such instrumentalities until the operator shall again actuate the clutch controlling mechanism, and in the machine of the drawing this mechanism is preferably constructed and arranged as follows:—Mounted in suitable bearings 54 projected from the side of the frame 1 is a shipper rod 55, which at one end carries a yoke or fork 56, engaging a groove 57^a formed in the collar or hub of the gear 22. The shipper rod 55 is moved longitudinally in its bearings 54 for the purpose of moving the gear 22 toward the pulley 19 to couple the complementary clutch faces 20 and 21, by means of a coiled spring 57 surrounding the rod 55, which at one end bears against the inner face of the front bearing 54 and at the opposite end against a collar 58 fixedly secured to said rod. The rod 55 is moved in the opposite direction in its bearings 54 against the tension of spring 57 to move the gear 22 away from the pulley 19 to disconnect the clutch faces 20 and 21, by means of the lever 59 which is fulcrumed at 60 to the head of the frame 1, one end 61 of said lever engaging the fixed collar 58 on the shaft 55, and the opposite end of the lever carrying a pin 62 which is engaged by the notched end 63 of a lever 64 fulcrumed at 65 on the head of the frame 1. The opposite end 66 of the lever 64 is arranged to be engaged by a projection 67 carried by a sleeve 68 mounted on the upper end of the vertical shaft 29, whereby as the projection 67 comes in contact with the end 66 of the lever 64, it will rock said lever about its fulcrum, causing the forked end of the lever 64 to rock the lever 59, to move the rod 55 against the tension of the spring 57, to disconnect the clutch faces 20 and 21, and such clutch faces will be held disconnected so long as the projection 67 remains in engagement with the end 66 of the lever 64.

For the purpose of removing the projection 67 from engagement with the end 66 of the lever 64, to permit the spring 57 to move the shipper rod 55 to connect the clutch faces 20 and 21, I have splined the sleeve 68 to the shaft 29, as by means of a pin 69 engaging a slot 70 in said sleeve, so that said sleeve 68 may be vertically movable on the shaft 29, thus moving the projection 67 in a plane above the plane of movement of the arm 66 of the lever 64.

The sleeve 68 is normally held depressed

with the projection 67 in the plane of movement of the lever 64, to engage the arm 66 of said lever 64, whenever the rotation of said sleeve shall bring the projection to the point shown in Fig. 3 of the drawings, by means of a coiled spring 71 surrounding the upper end of the shaft 29 and bearing at its lower end against the sleeve 68, and at its upper end against an adjustable head or screw 72 threaded on the upper end of the shaft 29. The sleeve 68 is moved vertically against the tension of the spring 71 to remove the projection 67 from engagement with the end 66 of the lever 64, by means of a fork or yoke 73, provided with pins or rollers 74 engaging a groove 75 formed in the sleeve 68, such fork or yoke 73 being fixedly secured to the end of a rock shaft 76 mounted to turn in suitable bearings 77 carried by the head of the frame 1, and said rock shaft carries at its opposite end an arm 78 which is connected by means of a rod 79 to a foot treadle 80, fulcrumed at 81 to the base of the frame 1.

The operation of the mechanism is described as follows:—The parts being in the position shown in Figs. 2 and 3 of the drawings with the clutch faces 20 and 21 disconnected, the operator by placing his foot upon the foot treadle 80 and depressing said treadle will, by means of the rod 79, rock the rock shaft 76, which by means of the fork 73 will raise the sleeve 68 against the tension of the spring 71, and remove the projection 67 carried by said sleeve from engagement with the arm 66 of the lever 64, whereupon the spring 57 will move the shipper rod 55, which by means of the fork 56 will move the gear 22 toward the pulley 19 connecting the clutch faces 20 and 21, thus imparting a rotary motion to the gear 22, which will in turn through the connecting mechanism which has been hereinbefore described, rotate the shaft 29, imparting the movements which have been described to the jack, and the operator having removed his foot from the treadle, permitting the spring 71 to depress the sleeve 68, whenever said sleeve shall have completed one rotation with the shaft 29, the projection 67 will again engage the arm 66 of the lever 64, and cause the lever 59 to move the shipper rod 55 in the opposite direction against the tension of the spring 57, disconnecting the clutch faces 20 and 21 and stopping the rotation of the gear 22 and the mechanism actuated thereby.

The heel compressing and attaching instrumentalities of the machine of the drawings comprise a suitable slide 82 carrying a horizontally disposed templet or nail block carrier 83, in which is fitted a templet or nail block 84 in any suitable manner, and of any suitable or preferred construction, such

templet or nail block, as in machines of this general type, being provided with a series of nail receiving apertures or pockets 85. The slide 82 is arranged to have vertical reciprocations along the front of the frame 1, it being provided with a dove-tail groove 86, which engages a dove-tail guide 87 formed on the front of the frame 1. The slide 82 is normally held elevated in an intermediate or counterbalanced position by means of a lever 88, which is fulcrumed at 89 to the side of the frame 1, the forward end of the lever 88 engaging a pin or other suitable projection 90, on the side of the slide 82, and its rear end being connected to one end of a coiled spring 91, the opposite end of which is connected to a hook or other suitable device 92, secured to the fixed frame 1. After the jack and shoe have been moved upward so as to place the heel seat of the shoe in contact with the heel supported beneath the templet or nail block 84, by suitable heel holding devices, to be hereinafter described, the slide 82 will be moved downward for the purpose of applying pressure to the heel, compressing the lifts of such heel prior to the driving of the attaching nails.

In the present machine, I have provided suitable mechanism for imparting the heel compressing movement to the templet or nail block, constructed and arranged so that the pressure applied to the heel will be uniform whether such heels be high or low, and this adjustment of the actuating mechanism is automatically secured according to the height of any given heel. The mechanism for actuating the templet to compress the heel and for securing the automatic adjustment of the pressure is, in the machine of the drawings, constructed and arranged as follows:—Upon the forward end of the shaft 18 is an eccentric 93, which eccentric is arranged to engage and depress a plunger 94, the upper end of the plunger being preferably yoke-shaped or formed with a recess 95, as shown in Fig. 5 of the drawings, in which recess is fitted a wear block 96, with which the eccentric is arranged to engage to depress the plunger 94. The plunger 94 extends downwardly as shown in dotted lines Fig. 4, and the lower end thereof is guided in a bearing 97 formed in the dove-tail guide 87 of the frame 1. The plunger is provided with an undercut projection 98 having an inclined face 99 (see Fig. 4 of the drawing) and the inclined face of this undercut projection rests upon the inclined face 100 of a wedge block 101, which wedge block rests upon and is free to move along the upper surface of the slide 82 carrying the templet or nail block 84.

It will be observed that the horizontal adjustment of the wedge block 101 will effect

a vertical adjustment of the templet 84 adjusting said templet up or down with relation to the plunger 94 according as the wedge block is moved in or out, and causing the distance from the under face of the templet and the surface of the wear block, which engages the eccentric, to be varied, and thus varying the compressive movement of the templet according as the heel to be compressed is high or low and securing a uniform pressure on all heels.

As has hereinbefore been described, the vertical movement of the jack brings the heel seat of the shoe in contact with the heel or top lift supported beneath the templet, and during this vertical movement, after the heel seat has been brought in contact with the heel or top lift, the further upward movement of the jack will carry with it the slide and templet, and I have arranged the wedge block 101 to be moved in or out by the rise and fall of the templet, and preferably by the mechanism shown in the drawings. This mechanism comprises a bell crank lever 102 which is fulcrumed at 103 to a bracket 104, projected from the side of the frame 1, one arm of the bell crank lever carrying a fork 105 which engages a stud 106 carried by a block 108 mounted on a threaded adjusting rod 107 secured so as to be capable of turning in the end of the wedge block 101, and provided with a suitable head 109 whereby the said rod may be turned to adjust the block 108, which carries the stud 106 along the rod 107, said block being provided with a threaded bearing engaging a threaded portion of the rod 107, as clearly shown in Fig. 4 of the drawing. The opposite end of the bell crank lever 102 rests upon a fixed lug 110 projected from one side of the slide 82, so that an upward movement of said slide will rock the bell crank lever 102 to move the wedge block outward or to the right as the machine is shown in the drawing. The bell crank lever is rocked in the opposite direction by means of a spring 102*, which at one end is secured to such lever and at its opposite end to a fixed portion of the frame and thus forces the wedge block into a position beneath the plunger 94 according to the position to which the counter-balancing lever 88 moves the templet carrier. By connecting the lever 102 to the rod 107 by means of the pin and slot and recessing the end 105 of such lever, as shown in dotted lines Fig. 4, the wedge block may move downward with the templet carrier when applying pressure. It will thus be seen that the upward and downward movements of the slide 82 will, by means of the bell crank lever 102 and the rod 107, move the wedge block 101 along the upper surface of the templet carrier and such movement will

adjust the templet with relation to the plunger 94 to raise or lower such templet according as the wedge block is moved in or out.

From the foregoing it will be seen that after the shoe has been placed in contact with the heel or top-lift supported beneath the templet, a rotation of shaft 18 will, by means of the eccentric 93 and plunger 94 and the interconnecting instrumentalities which have been described, impart a downward compressive movement to the templet, and that such compressive movement will be rendered uniform on all heels whether said heels be high or low. As hereinbefore described, the templet is provided with the usual nail receiving pockets 85, and while it is held down by the eccentric maintaining the heel under pressure, these nails are driven from the nail pockets through the heel and clenched in the insole. Any suitable nail driving devices may be employed, those shown in the drawing comprising a gang or group of nail drivers 113 supported by a plunger or cross-head 114, said cross-head being arranged to have a vertical reciprocation in a suitable guideway 115, formed in the front of the head of the machine, and this plunger 114 is reciprocated by means of a crank pin 116, carrying a block 117 fitted in a recess 118 formed in the plunger 114, which crank pin 116 is carried at the front of the eccentric 93, it being so located relatively to the throw of the eccentric that it will impart a downward movement to the gang or group of drivers after such eccentric has imparted the heel compressive movement to the templet or nail block.

The rotation of the shaft 18 is produced by the rotations of the pulley 19 which is loose on said shaft, by means of a clutch collar 119, which is fast on the shaft 18 and which is provided with a bolt 120 fitted in a recess or bearing in the collar 119, and normally forced outward by means of a spring 121, seated in said recess and acting against the rear end of the bolt 120, arranged to project said bolt from the recess in the collar 119 to engage a recess 122 in the hub of the gear 22, the arrangement being such that when the bolt 120 is projected into the recess 122, the collar 119 will turn with the gear 22 and pulley 19, thus rotating the shaft 18 and actuating the heel compressing and nail driving instrumentalities. The bolt 120 is withdrawn from the recess 122 to disconnect the collar 119 to stop the rotations of the shaft 18 by means of a rod 123 arranged to slide vertically in a bearing 124 in the frame 1, and having at its upper end a beveled end or shoulder arranged to engage a complementary beveled shoulder on the bolt 120 to withdraw said bolt.

In order that the shaft 18 may be rotated to actuate the heel compressing and nail driving instrumentalities in proper time relation to the jack positioning and elevating instrumentalities, that is, after the jack positioning and elevating instrumentalities have properly positioned the jack and raised the shoe thereon in contact with the heel supported beneath the templet, I have, in the machine of the drawing, provided connecting mechanism, whereby after the jack has been positioned and elevated as described, the bolt 120 will be thrown into the aperture 122 to rotate the shaft 18 to impart to the heel compressing and nail driving instrumentalities their compressing and driving movements, and such connecting mechanism in the machine of the drawing is arranged as follows:—The rod 123 is normally elevated and held with its beveled shoulder in position to engage the beveled shoulder of the bolt 120 to withdraw such bolt by means of a coiled spring 125 which bears at one end against a suitable step or lug 126 and at its other end against a shoulder on the rod 123. To depress said rod against the tension of the spring 125, said rod is connected near its lower end to a lever 127 (see Fig. 1 of the drawings) fulcrumed at 128 to the rear of the frame 1, and which at its outer end carries a cam roll 129 resting upon and engaging a cam 130, fixed to the vertical shaft 29, the throw of the cam 130 being so positioned that after said shaft has been turned by the mechanism hereinbefore described a sufficient distance to cause the cams 36 and 46 to position and elevate the jack and bring the shoe thereon in contact with the heel supported beneath the templet, said cam 130 will rock the lever 127 and move the rod 123 downward removing the beveled shoulder thereof from engagement with the beveled shoulder on the bolt 120, thus permitting the bolt to engage the aperture 122 of the gear 22, and through the collar 119 rotate the shaft 18 and actuate the heel compressing and nail driving instrumentalities. After the throw of the cam 130 has passed the cam roll 129 on the lever 127, the spring 125 returns the rod 123 to its normal position with its beveled shoulder in the path of movement of the beveled shoulder of the bolt 120, so that after the collar 119 has made one revolution, the bolt 120 will be withdrawn, disconnecting the collar 119 from the gear 22 and stopping the shaft 18.

From the foregoing description it will be noted that the present invention comprises automatic means for positioning the jack and shoe with relation to the heel compressing and attaching instrumentalities, and automatic means thereafter imparting a relative movement to the jack and heel com-

pressing instrumentalities to seat the heel on the shoe; automatic adjusting means controlled by the relative movement of the jack and heel compressing instrumentalities in bringing the heel and shoe together, and connected mechanism, whereby after the shoe has been positioned, and the heel seated as described, the heel compressing and nail driving instrumentalities will be automatically actuated to compress the heel and drive the heel attaching nails to secure the heel to the shoe.

In machines of this type as heretofore constructed, the jacks have usually been provided with a jack post carrying a spindle to take in to the socket in the last, and the shoe has been centered or clamped on the jack by clamping jaws or levers, which have usually been so constructed and arranged as to be thrown in contact with the sides of the heel end of the last by means of screw threaded rods, or other manually operated devices, and in such devices inasmuch as the last was positioned by the immovable pin which fitted into the last socket and therefore could have no movement with relation to its support, it required considerable care and skill on the part of the operator to position the jack to place the heel end of the shoe in proper alinement with the heel compressing and attaching instrumentalities. In the machine of the drawing, I have so constructed my last supporting and clamping devices, that when the jack support 10 is moved as hereinbefore described, from the position to one side of the heel compressing and nail driving instrumentalities, to a position beneath such instrumentalities, the shoe will be automatically centered with relation to the heel supported by the templet, and the compressing and attaching devices, and the clamping devices automatically actuated to clamp the last with the shoe thereon, and maintain it in proper position during the operation of attaching the heel. The mechanism whereby this is accomplished in the machine of the drawing is as follows:—The jack support 10 (see Fig. 6) is preferably provided with a bearing 131 in which fits the stem 132 which supports the bed or table 133 of the jack. The stem 132 is provided with a groove 134 in which is projected a pin 135 carried by the jack support 10, permitting the stem 132 to have a vertical adjustment in the jack support 10, but preventing it from turning therein. This vertical adjustment is secured by forming the stem 132 with a coarse exterior screw thread 136, which is engaged by a threaded sleeve 137 which rests on the upper surface of the jack support 10, and which is provided with means, such as the handles 138, whereby the sleeve may be turned and thus impart a vertical adjustment of the stem 132 in the jack support 10.

The table 133 which supports the jack is fitted with a post 139 which is located in substantial vertical alinement with the heel supporting post 140 of the jack, as clearly shown in Fig. 6 of the drawing, and which fits a cylindrical bearing 139* in the stem 132. The table 133 therefore may be turned slightly laterally in order to adjust the heel end of the shoe for rights and lefts, according to the difference in swing between right and left shoes, and this lateral adjustment of the table 133 is limited and controlled by adjustable stops or pins 141 arranged to be positioned in holes 142 formed in the forward end of an arm 143 fixedly secured by means of a screw or other suitable devices 144 to the reduced portion 145 of the spindle 132.

The toe support 146 may be of any usual or preferred construction, that shown in the drawing being substantially like the toe support in the jack disclosed and claimed in my pending application, Serial No. 43,592, filed January 17, 1901, comprising a suitable post 147 arranged to have a longitudinal adjustment along a guideway formed in the upper surface of the table 133 and positioned at varying distances from the heel support according to the size of shoe being operated upon, by means of a latch 148 pivoted at 149 to the toe support and arranged to engage notches or recesses 150 formed along one side of the table 133. The toe support proper 151 is preferably formed with a yoke to receive the forward part of the shoe and is arranged to be vertically adjusted in the post or casing 152 of the toe support, it being raised and lowered by means of a pinion and rack mechanism (not shown) such as disclosed in the application hereinbefore referred to, and controlled by the hand wheel 153 whereby the toe support 151 may be raised and lowered, all as disclosed in said application.

The heel supporting post 140 carries at its upper end a block 154 which is arranged to rest loosely on the upper end of the post 140 and upon which the "comb" of the last rests and over which the last is free to have a sliding movement for the purpose of properly positioning the last and the shoe on the jack as will be hereinafter described. This block 154 rests at its forward end upon a vertically adjustable support 155 which is secured to the spindle or post 140 by means of a screw 156 passing through the slot 157 in the adjustable support, the lower end of the adjustable support resting upon a cam ring 158 which may be turned by the operator for the purpose of raising or lowering the support 155 to raise or lower the forward end of the block 154.

In the present invention I have provided the jack with a back-gage or abutment against which the rear end of the last is

placed when the shoe is positioned in the jack, and this stop or abutment in the machine of the drawing is carried by the upper end of a lever 159 which is fulcrumed at 160 to an upwardly projecting portion 161 of the table 133, the upper end of the lever 159 being projected forward to engage the rear or counter of the heel portion of the last with the shoe thereon. The said lever 159 is adjustable about its fulcrum 160 to move the stop nearer to or farther away from the heel post 140 by means of an adjusting screw 162, which is threaded into the bearing 163 carried by an upwardly projecting arm 164, and the lever 159 is held in engagement with the end of the adjusting screw by means of a spiral spring 165, which at one end engages a stud 166 carried by the arm 164 and at its other end bears against the inturned arm 167 of the lever 159.

From the foregoing, it will be noted that no matter at what point the usual spindle hole may be bored in the last, or how much said hole may vary with regard to the rear end of the last, the adjustment of the last in the jack will not be affected, as in the present machine the last being supported by a block upon which the "comb" of the last rests, the said last may be freely moved by the operator over said block until the rear or back of the heel portion thereof engages the back-stop 159, and that having once secured the proper adjustment of the back-stop, the throw of the jack being uniform, or, in other words, the jack being always brought to the same position beneath the heel compressing and nail driving devices, all the shoes of a given size will be uniformly centered, notwithstanding there may be variations in the positioning of the spindle sockets in the lasts, and this I consider to be a very important feature of my invention.

The jack clamping mechanism consists of clamps 168 which, as shown in Fig. 7, are arranged to engage the rear end of the last, and preferably at a point near the bottom of the last and also near the "comb" of the last, and these clamps are pivotally mounted by studs 169, in holders 170, which holders are provided with cylindrical shanks 171, fitted in bearings 172 and arranged to be adjusted therein to properly position the clamps 168, and in which they are secured by means of set screws 173 arranged to engage with the cylindrical shanks 171. The bearings 172 are carried at the upper ends of levers 174 pivotally mounted at 175 to arms 176, the lower end of each of the levers 174 being connected to one end of a coiled spring 177, the coil of which surrounds a stud 178 carried by the arm 176 and the opposite end of which is secured to said arm. In the lower end of each lever 174 there is

fitted an adjustable stop 179 shown as a threaded stud tapped into the threaded bearing in said lever and arranged to be brought in contact with a projection 180 formed on the arm 176 for the purpose of adjusting the levers 174 about the pivots 175 and thus adjust the clamps 168. The clamps 168 are forced in engagement with the shoe by means of the arms 176 which, at their lower ends are fixedly secured to rock shafts 181 arranged to turn in suitable bearings 182 carried by the table 133, said shafts at their opposite ends carrying cranks 183, which are pivotally connected with toggle levers 184 (see Fig. 8 of the drawings). A downward movement of the toggle levers 184 will rock the shafts 181 to throw clamps 168 in contact with the last and shoe, and an upward movement of said toggle levers will move the clamps away from the shoe. These toggle levers at their union are pivoted by a stud 188* to a vertically reciprocating plunger 185, which is forced downward to actuate said toggle levers to cause the clamps to clamp the shoe by means of a bell crank lever 186 fulcrumed to the table 133, the inner arm 188 of said lever being forked and carrying blocks 189 which engage with recesses 190 formed in the plunger 185. The opposite end of the lever 186 carries a rounded head 191, to be engaged by an actuating device, to be hereinafter described, whereby said lever 186 will be rocked about its fulcrum 187 to actuate the toggle levers 184 to rock the shafts 181 to throw the clamps 168 in contact with the last and shoe. The lever 186 is rocked in the opposite direction by means of a spring 192 seated in a recess 193 and bearing at its upper end against the arm 188 of said lever, and said spring normally acts to hold the lever in the position in which it is shown in Fig. 6 of the drawings, to maintain the clamping devices 168 open, whereby the last may be readily inserted in the jack.

As hereinbefore stated, the clamps 168 are automatically actuated to grip the shoe and last as the jack is moved by the cam actuated mechanism hereinbefore described, from the position shown in Fig. 1, to a position which will place the heel end of the jack in line with the heel compressing and nail driving devices, and this automatic closing of the clamps is secured by a plate 194 carried by a spring sustained plunger 195 fitted to have a sliding movement in a bearing 196 supported by a bracket 197 fixedly secured to the frame 1. The plunger 195 is surrounded by a coiled spring 198 fitted in the bearing 196 which engages at one end against the shoulder of such plunger, and at its opposite end against the closed end of the bearing. The plate 194 is so located that as the jack is moved to a position to place the shoe

in alinement with the heel compressing and nail driving devices, the head 191 of the lever 186 will come in contact with such plate 194 and rock the lever 186 about its fulcrum 187 actuating the heel clamping devices to clamp the shoe, as hereinbefore described.

As hereinbefore explained, the jack and shoe will have two reciprocations toward and from the templet, while the jack carrier holds it beneath or in line with said templet, and in order to permit this vertical movement, while maintaining the clamping devices in their clamping position, the head 191 of the lever 186 is provided with a rounded face as shown in the drawing, and the plate 194 is elongated vertically and preferably provided with a smooth face, whereby during the vertical movement of the jack, the rounded head 191 may move freely over the face of the plate 194, while the clamps are maintained in contact with the shoe.

In the present machine as shown in the drawings, the heel is attached in the manner common to many machines of the prior art, that is, the securing nails are driven through the heel and clenched into the insole of the boot or shoe, the drivers being of such a length relatively to the depth of the templet, as to drive the heel attaching nails, leaving their upper ends projecting a short distance beyond the surface of the heel blank, and thereafter the top lift is "spanked" on to the projecting ends of the heel attaching nails. In the present machine, there are provided heel blank and top lift holders, so supported that when one of said holders shall have been moved to a position beneath the templet, the other holder will be projected in front of the templet and turned up in convenient position for the operator to insert the heel blank or top lift therein, according as the heel blank or top lift holder shall be in the loading position.

In Figs. 11 and 12 of the drawing there is shown in enlarged views the preferred arrangement of mechanism for supporting and actuating the heel blank and top lift holders, such views illustrating the heel blank holder supporting the heel beneath the templet and the top lift holder in position to be supplied with a top lift, or the loading position.

Pivotally mounted upon a stud 199 supported in the under face of the templet carrier, is a revolving carrier 200, which, at its opposite ends is provided with bearings 201 and preferably with projecting finger pieces 202, whereby the revolving carrier may be turned about the stud 199 to alternately place the top lift holder and heel blank holder beneath the templet. Mounted in the bearings 201 are shafts 203 which pro-

ject, as clearly shown in Fig. 12, in opposite directions from the carrier 200. The heel blank holder comprises a skeleton plate 204 cut out as shown at 205, which, at its rear end is provided with bearings 206 supported on one of the shafts 203, whereby said holder may be turned about said shaft to place it in a horizontal position, as when supporting a heel blank beneath the templet, as shown in Figs. 11 and 12 of the drawings, and whereby it may be turned up into the position which the top lift holder occupies as illustrated in Fig. 11. The top lift holder 207 consists of the usual spanking plate, and like the heel holder it is provided along its lower end with bearings 208, supported on the other shaft 203, and arranged to be turned on said shaft in a manner similar to the heel blank holder. The top lift and heel blank holders are arranged to be automatically thrown to the position which the top lift holder occupies in Fig. 11, (the loading position), whenever the revolving carrier 200 shall be turned to bring said holders in front of the templet carrier 83, and for this purpose each of the shafts 203 is surrounded by a torsional coiled spring 209, one end of which is fixedly secured to the shaft, and the opposite end to one of the bearings of the heel blank and top lift holders, respectively, the tendency of the springs 209 being such as to throw said holders when brought to the front of the templet carrier into the position which the top lift holder occupies in Fig. 11.

In order to limit the throw of the heel holder or the top lift holder, and maintain them in preferably a slightly inclined position as shown in Fig. 11 of the drawing, the bracket 212 is preferably extended laterally as shown in Fig. 11 and at its rear end carries an inclined supporting plate 217 against the face of which the top lift or heel blank holder is arranged to be supported while the operator places therein the top lift or the heel blank, as the case may be. There is also provided an elastic buffer or stop, which in the machine of the drawing, consists of a lever 210 fulcrumed at 211 to the bracket 212 secured to the front of the templet carrier 83, which lever is supported intermediate of its ends by a coiled spring 213, one end of which is seated on a stud 214 carried by the bracket 212, and the other end of which engages a stud 215, carried by the lever 210. The opposite end of the lever is projected beyond the spring in position to be engaged by a stud 216 projected from the inner side of the heel blank and top lift holders respectively.

From the foregoing description, it will be observed that when the parts are in the position shown in Figs. 11 and 12 of the drawing, the heel blank holder will be projected

beneath the templet and will support the heel as shown in dotted lines Fig. 12, in position beneath the nail pockets in said templet, and that after the heel has been attached as hereinbefore described, the top lift holder will be turned down against the tension of the spring 209 in order to place it in substantially a horizontal position, and the carrier 200 turned in order to move the top lift holder beneath the templet and the heel blank holder to the front, to the position which the top lift holder occupies, as shown in the drawing. For the purpose of maintaining the heel and top lift holders in a horizontal position during the turning of the carrier 200 to place such holders beneath the templet and until such holders shall reach a point in front of and close to the front of the templet carrier 83, there is provided a retaining device, shown as a disk d fixedly secured to the stud 199 above the carrier 200 and provided at the front with a notch d' , permitting the studs 216 to be moved to a plane beneath the disk d , thus holding the holders down while the carrier 200 is being turned and permitting such holders to be swung up when the studs reach the notch d' .

Each of the holders is provided with suitable gripping jaws which may be of any usual or preferred form to grip the heel blank or top lift, such jaws in the machine of the drawing being shown as substantially bell crank levers 218, pivotally secured by studs 219 to the under face of the holders, and preferably having complementary intermeshing notches and teeth 220 and 221, and being rocked about their pivots 219, by means of springs 222, interposed between their rear ends 223, whereby the forward ends of the gripping devices will engage the heel blank or top lift as the case may be.

For the purpose of maintaining the carrier 200 in position with the heel blank holder or top lift holder beneath the templet, I have provided suitable locking devices which, in the machine of the drawing, consist of latches 224, carried by levers 225 pivoted, respectively, at 226 to the opposite ends of the carrier 200, and arranged to engage with a slot 227 in a locking plate 228 fixed to the front of the templet carrier 83, and said latch levers are normally held pressed upwardly to cause the latches 224 to engage the recess 227 by means of leaf springs 229, which are secured to the carrier 200, the forward ends engaging the latch levers 225.

The latch levers are depressed to remove the latches 224 from engagement with the slot 227 by the movement of the heel blank holder or top lift holder, as the case may be, into a horizontal position, and for this purpose the latch levers are projected some distance beyond their pivots 226 and are ar-

ranged to be engaged by the studs 216, carried by said holders, whereby as the holders are turned down as described, they will depress the latch levers 225 and remove the latches 224 from the slot 227, after which the carrier 200 may be turned to place the heel blank holder or top lift holder, as the case may be, beneath the templet, and when the carrier has been turned to the position shown in Figs. 11 and 12, the holder which may then be to the front, will be automatically turned up into a loading position, and one of the latches 224 will engage the slot 227 and maintain the holder in that position during the operation of attaching the heel and spanking on the top lift as the case may be.

Any suitable device may be provided for loading the templet or nail blank with nails, that shown in the machine of the drawings comprising the well known "skimmer" 230, which, as common in such devices, is provided with a sliding plate 231, arranged to retain the nails in such "skimmer". The "skimmer" is adjustably connected at 232 to a slotted arm 233 pivoted to the upper surface of the templet, and it is provided with a handle 234, whereby it may be turned from the position shown in Fig. 12, in which position the operator loads the skimmer with nails, to a position which will bring such skimmer over the templet 84 with the holes in such skimmer, registering with the nail pockets in the templet. To automatically slide the plate 231 to bring its holes into register with the holes in the skimmer for the purpose of permitting the nails in such skimmer to drop into the pockets of the templet, there is provided a stop 235 adjustably secured by means of a stud and slot 236 and 237 to the upper surface of the templet carrier 83 against which the projecting end 238 of the sliding plate 231 is arranged to contact to force said sliding plate backward against the tension of the spring 239, and thus release the nails and permit them to drop into the nail pockets of the templet, after which the skimmer 230 will be moved to the position shown in Fig. 12 and there remain during the operation of driving the heel attaching nails and spanking on the top lift.

The operation of the machine of the drawings is described as follows:—The shoe having been placed on the jack in an inverted position with the heel end thereof against the positioning stop 159, and the toe resting on the toe rest 151, and the templet having been loaded with nails and the heel holder and top lift holder provided with a heel blank and top lift, and the carrier 200 moved to the position shown in Figs. 11 and 12, with the heel holder supporting the heel beneath the templet, the operator places his

foot upon the treadle 80 and by means of the rod 79 rocks the shaft 76, thus raising the sleeve 68 and removing the projection 67 from contact with the arm 66 of the lever 64 and permitting the spring 57 to slide the rod 55 in its bearings, moving the gear 22 toward the pulley 19 and coupling the clutch faces 20 and 21. The gear will now be rotated by the pulley 19 and impart a rotary movement to the shaft 29, which by means of the beveled gears 31 and 32, will rotate the cam shaft 33 causing the cam 36 to move the jack from the position shown in Fig. 1 to a position which will bring the heel end of the shoe in line with the heel compressing and nail driving devices. This movement of the jack has caused the head 191 of the lever 186 to be brought in contact with the plate 194 carried by the plunger 195, and the lever 186, by the instrumentalities which have been hereinbefore described, will automatically throw the last clamping devices in contact with the sides of the last. After the last has been positioned and clamped as described, the cam 46 will have completed, by means of the toggle levers 41 and 42, the upward movement of the jack and shoe, bringing the heel end of the sole of the shoe against the heel supported beneath the templet, and the contact of the shoe with such heel, will have positioned the templet carrier so as to automatically adjust the pressure applied by such templet carrier to the heel, as has been hereinbefore fully set forth. When the heel of the shoe has been brought in contact with the heel as described, the cam 130 on the shaft 29 will come in contact with the roll 129 on the lever 127, rocking said lever and withdrawing the rod 123, permitting the bolt 120 to engage the recess 122, thus coupling the collar 119 to the gear 22 and causing a rotation of the shaft 18. The rotation of the shaft 18 will, by means of the eccentric 93 and the inter-connecting mechanism which has been hereinbefore described, impart a downward movement to the slide 82 of the templet carrier 83, causing the desired amount of pressure to be applied to the heel, and while the slide and templet are held down with the heel under pressure the crank 116 operates the nail drivers 113 which descend and drive the nails out of the pockets in the templet, through the heel and into the insole of the boot or shoe, after which the drivers rise and the pressure on the templet is released, and it is raised slightly by means of the counter-balancing lever 88, and the cam 46 will impart a slight downward movement to the jack carrier bed, after which the machine will stop. The operator now turns the carrier 200 to place the top lift holder beneath the templet 83 and again places his foot

upon the treadle 80 when the operation of the clutches just described will "spank" the top lift on to the projecting ends of the nails, and the continued operation of the machine will cause the jack to be moved to its lowermost position, and the cam 36 will move the jack to the position shown in Fig. 1, thus releasing the last from the clamping devices, after which the machine will stop with the parts in the position shown in Fig. 1, with the jack in convenient position for the removal of the shoe therefrom and the replacing of another shoe therein, and this completes the operation of the machine.

Having thus described my invention, I claim as new and desire to secure by Letters Patent of the United States.

1. The combination with a shoe supporting jack and heel attaching devices comprising a templet, of a carrier pivotally secured thereto, a heel holder and a top lift holder mounted on said carrier and arranged to be alternately positioned beneath and projected in front of the templet, and means for moving said holders into a loading position when projected to the front of the templet, substantially as described.

2. The combination with heel attaching devices and a shoe supporting jack, relatively movable into and out of alinement with each other, of means acting automatically to relatively actuate said devices and jack to bring the jack in alinement with the heel attaching devices, means for moving the jack toward the heel-attaching devices to contact the heel and shoe, and connected mechanism to thereafter actuate the heel attaching devices to compress and attach the heel, substantially as described.

3. The combination with a shoe supporting jack, and a pressure applying templet, means for actuating said templet to apply pressure to the heel of a shoe supported on the jack, and automatic mechanism actuated by the templet carrier for adjusting the pressure applying mechanism, substantially as described.

4. The combination with a shoe supporting jack, of a pressure applying templet arranged to be positioned by the contact of the shoe on said jack with the heel supported beneath the templet, and automatic mechanism actuated by the movement of the templet for regulating the pressure applied to the heel by said templet, substantially as described.

5. The combination with a pressure applying templet, of a shoe supporting jack, means to move the jack toward the templet to bring the heel seat of the shoe supported thereon in contact with the heel to be attached, a plunger for actuating the templet to apply pressure to the heel, an adjusting wedge arranged to slide over the templet

carrier and interposed between the plunger and said carrier, and means controlled by the movement of the templet carrier for automatically moving said wedge to adjust the pressure applied to the heel, substantially as described.

6. The combination with heel attaching devices and a shoe supporting jack, movable into and out of alinement with each other, of last centering clamps, and means for automatically actuating said clamps to clamp the last as said jack and heel attaching devices are brought into alinement with each other, substantially as described.

7. The combination with heel attaching devices and a shoe supporting jack, of means for automatically moving said jack into and out of alinement with the heel attaching devices, last centering clamps, and means for automatically actuating said clamps to clamp the last when the jack is moved into alinement with the heel attaching devices, substantially as described.

8. The combination with heel attaching devices, of a shoe supporting jack movable into and out of alinement with said heel attaching devices, of last centering clamps, and means to automatically actuate said clamps to clamp the last when the jack is brought into alinement with the heel attaching devices, constructed and arranged to permit a reciprocating movement of said jack and clamps while the clamps remain in engagement with the last, substantially as described.

9. The combination with heel attaching devices, and a shoe supporting jack movable into and out of alinement with said heel attaching devices, of last centering clamps, a lever and connecting devices for actuating said clamps, and means supported by the frame of the machine in position to engage said lever when the jack is brought into alinement with the heel attaching devices to actuate said clamps to clamp the last, substantially as described.

10. The combination with heel attaching devices and a shoe supporting jack movable into and out of alinement with said heel attaching devices, of last centering clamps, and automatically operating, yielding mechanism for causing said clamps to clamp the last when the jack is brought into alinement with the heel attaching devices, substantially as described.

11. The combination with a heel compressing templet and a shoe supporting jack, of means for actuating said templet, to apply pressure to the heel, means for automatically adjusting the templet actuating mechanism to regulate the pressure applied to the heel, and means for preliminarily adjusting the templet actuating mechanism, substantially as described.

12. The combination with heel attaching devices, of a shoe supporting jack movable into and out of alinement with the heel attaching devices, a last support on said jack
5 arranged to permit a free movement of the last thereon, a stop for positioning the last on the last support, means for holding the last in position and means for actuating the jack, substantially as described.

10 13. The combination with heel attaching devices, of a shoe supporting jack, comprising suitable heel and toe supports, the heel support having a block upon which the comb of the last rests, a stop for engaging
15 the back of the last for positioning it upon the block, and means for relatively actuating the jack and heel attaching devices to attach the heel when the last has been positioned, substantially as described.

20 14. The combination with heel attaching devices, of a shoe supporting jack comprising a heel post, a block on said heel post for supporting the comb of the last, means for adjusting said block to conform to the comb
25 of the last, and means for relatively actuating the jack and heel attaching devices to attach the heel when the block has been adjusted, substantially as described.

30 15. The combination with heel attaching devices, of a shoe supporting jack, last centering clamps carried by said jack, rock shafts actuating said clamps, a plunger and connecting toggle levers for rocking said
35 rock shafts, a bell crank lever for actuating said plunger and means for relatively actuating the jack and heel attaching devices to attach the heel when the last has been centered, substantially as described.

40 16. The combination with heel attaching devices, of a shoe supporting jack, clutch mechanism under the control of the operator for positioning the jack and imparting
45 thereto a movement toward the heel attaching devices, and means controlled by the jack actuating mechanism to actuate the heel attaching devices, substantially as described.

50 17. The combination with a shoe supporting jack and heel attaching devices comprising a templet, of a carrier, a heel blank holder supported by said carrier, means
55 whereby the carrier and heel blank holder may be moved beneath the templet, and means for permitting the heel blank holder to move in a plane at right angles to the movement of the carrier to place the heel blank holder in position for receiving a heel blank, substantially as described.

60 18. The combination with a shoe supporting jack and heel attaching devices comprising a templet, of a carrier pivoted thereto to turn beneath the under face of the templet, a heel holder supported by the carrier to
move in a plane at right angles to the plane

of movement of the carrier, substantially as described. 65

19. The combination with a shoe supporting jack and heel attaching devices comprising a templet, of a carrier pivotally supported thereon, a heel blank holder, pivotally secured to the carrier to turn about an
70 axis at right angles to the axis of the carrier, substantially as described.

20. The combination with a shoe supporting jack and heel attaching devices comprising a templet, of a carrier pivotally supported near one edge thereof, a heel blank holder and a top lift holder pivotally secured to opposite ends of the carrier, and
75 arranged to be moved alternately into and out of position beneath the templet, and means for automatically moving said holders when moved out of position, in a plane at right angles to the plane of movement of the carrier to place said holders in a loading position, substantially as described. 85

21. The combination with a shoe supporting jack and heel attaching devices comprising a templet, of a carrier movably supported thereon, a heel blank holder and top lift
90 holder mounted on the carrier, means for moving said holders in a plane at right angles to the movement of the carrier and a rest for supporting said holders in the loading position, substantially as described. 95

22. The combination with a shoe supporting jack and heel attaching devices comprising a templet, of a carrier movably supported thereon, a top lift holder and a heel holder mounted on the carrier and movable in a
100 plane at right angles to said carrier, and a latch for holding the carrier with either the heel blank holder or top lift holder beneath the templet, substantially as described.

23. The combination with a shoe supporting jack and heel attaching devices comprising a templet, of a carrier movably supported on said templet, a heel blank holder carried by said carrier and arranged to be
105 moved at right angles to the plane of movement of the carrier to place said holder in the plane of movement of the carrier, and means for maintaining said holder in such position during the movement of the carrier beneath the templet, substantially as described. 115

24. The combination with a shoe supporting jack and heel attaching devices comprising a templet, of a carrier movably supported thereon, a heel blank holder, pivotally secured to the carrier to move in a plane at
120 right angles to the movement of the carrier, a spring for so moving said holder and an inclined supporting rest arranged to support said holder in its loading position, substantially as described. 125

25. The combination with a heel compressing templet and a shoe supporting jack, of

means for actuating said templet to apply pressure to the heel, and means for automatically adjusting the templet-actuating mechanism to regulate the pressure applied to the heel, substantially as described.

26. The combination with heel-attaching devices and a shoe supporting jack, of means for imparting to the jack and heel-attaching devices a relative movement to bring the heel and shoe into contact with each other, and mechanism automatically adjusted by such movement for relatively actuating the jack and heel-attaching devices to compress and attach the heel, substantially as described.

27. The combination with a shoe-supporting jack, of a templet, means for imparting to the jack and templet a relative movement to bring the heel and shoe in contact with each other, mechanism for relatively actuating the jack and templet to compress the heel, and automatic mechanism for adjusting said mechanism to regulate the pressure applied to the heel, substantially as described.

28. The combination with a shoe-supporting jack, nail drivers and a heel compressing templet, of connected mechanisms acting automatically to move the jack into alignment with the nail drivers and templet, to then move the jack toward the templet to bring the heel and shoe in contact with each other to then actuate the templet to compress the heel and finally to actuate the nail drivers, substantially as described.

29. The combination with heel-attaching devices and a shoe supporting jack, of means for imparting to said devices and jack a relative movement to bring the jack in alignment with said devices, means for imparting to the jack and heel-attaching devices a relative movement to bring the heel and shoe into contact with each other, mechanism for relatively actuating the jack and heel-attaching devices to compress and attach the heel, and means for automatically regulating the pressure applied to the heel, substantially as described.

30. The combination with a shoe supporting jack, of a templet, mechanism acting automatically to impart to the jack and templet a relative movement to bring the heel and shoe in contact with each other, and additional mechanism connected to said automatic mechanism and operating in timed relation thereto to actuate the templet to compress the heel, substantially as described.

31. The combination with a shoe supporting jack, of a templet, means for imparting to the jack and templet a relative movement to bring the heel and shoe in contact with each other, and mechanism automatically adjusted by such movement for relatively actuating the jack and templet to compress the heel, substantially as described.

32. The combination with a shoe supporting jack, of a templet, means for moving the jack toward the templet to bring the heel and shoe in contact with each other, means for relatively actuating the jack and templet to compress the heel, and means for automatically regulating the pressure applied to the heel, substantially as described.

33. The combination with a shoe supporting jack, of a templet and connected mechanisms acting automatically to move the jack toward the templet to bring the heel and shoe in contact with each other and to thereafter actuate the templet to compress the heel, substantially as described.

34. The combination with a shoe supporting jack, nail drivers, and a heel compressing templet, of connected mechanisms acting automatically to move the jack toward the templet to bring the heel and shoe in contact with each other to thereafter actuate the templet to compress the heel and finally to actuate the nail drivers to attach the heel, substantially as described.

35. The combination with a shoe supporting jack, nail drivers and templet, of jack actuating mechanism acting automatically to move the jack toward the templet to bring the heel and shoe in contact with each other, nail driver actuating mechanism and means for throwing the nail driver actuating mechanism into operation after the heel and shoe have been brought into contact with each other, substantially as described.

36. The combination with a shoe supporting jack, nail drivers and a templet, of jack actuating mechanism acting automatically to move the jack toward the templet to bring the heel and shoe into contact with each other, nail driver actuating mechanism, and means whereby the nail driver actuating mechanism is thrown into operation by the jack actuating mechanism, substantially as described.

37. The combination with a shoe supporting jack, of a templet, mechanism for imparting to the jack and templet a relative movement to bring the heel and shoe in contact with each other, mechanism for actuating the templet to compress the heel, and means whereby the templet actuating mechanism is thrown into operation by said mechanism for imparting a relative movement to the jack and templet, substantially as described.

38. The combination with a shoe supporting jack, and a heel compressing templet, of mechanism acting automatically to move the jack toward the templet to bring the heel and shoe in contact with each other, mechanism for automatically actuating the templet to compress the heel and means whereby the templet actuating mechanism can be thrown into operation after the heel

and shoe have been brought into contact with each other, substantially as described.

39. The combination with a shoe supporting jack, of a templet, means for imparting to the jack and templet a relative movement to bring the heel and shoe in contact with each other, mechanism for actuating the templet to compress the heel, and means acting automatically to throw the templet actuating mechanism into operation intermittently, substantially as described.

40. The combination with a shoe supporting jack, nail drivers and templet, of

means for imparting to the jack and templet a relative movement to bring the heel and shoe in contact with each other, nail driver actuating mechanism and means acting automatically to throw the nail driver actuating mechanism into operation intermittently, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

ERASTUS E. WINKLEY.

Witnesses:

F. HART ANDERSON,
A. E. WHYTE.