F. K. RUSSELL.

LEATHER WORKING MACHINE.

APPLICATION FILED JUNE 3, 1904.

922,195.

Patented May 18, 1909.

12 SHEETS—SHEET 1.

Fig. 1.

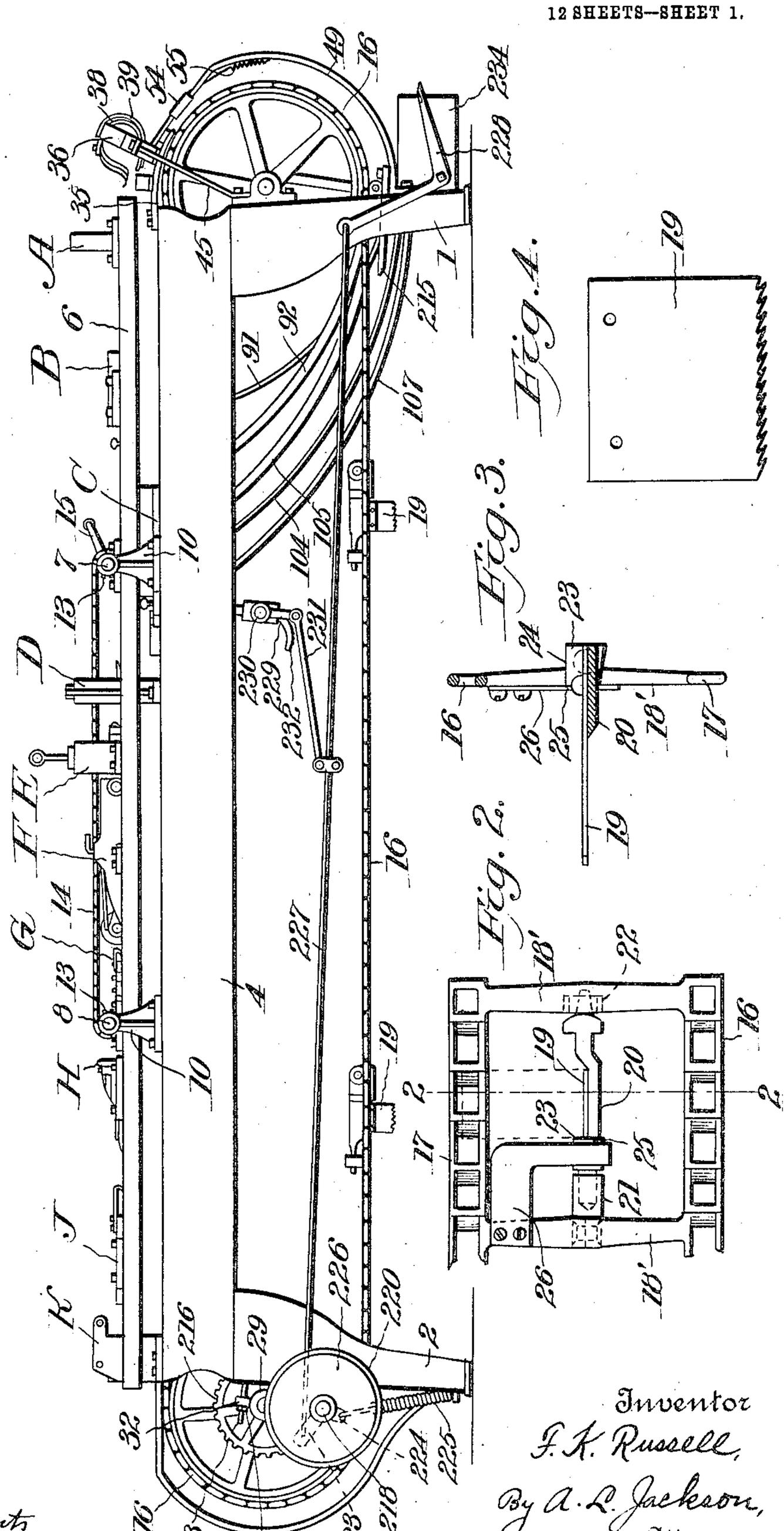

Fig. 4.

Fig. 3.

Fig. 2.

Witnesses

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12 SHEETS—SHEET 2.

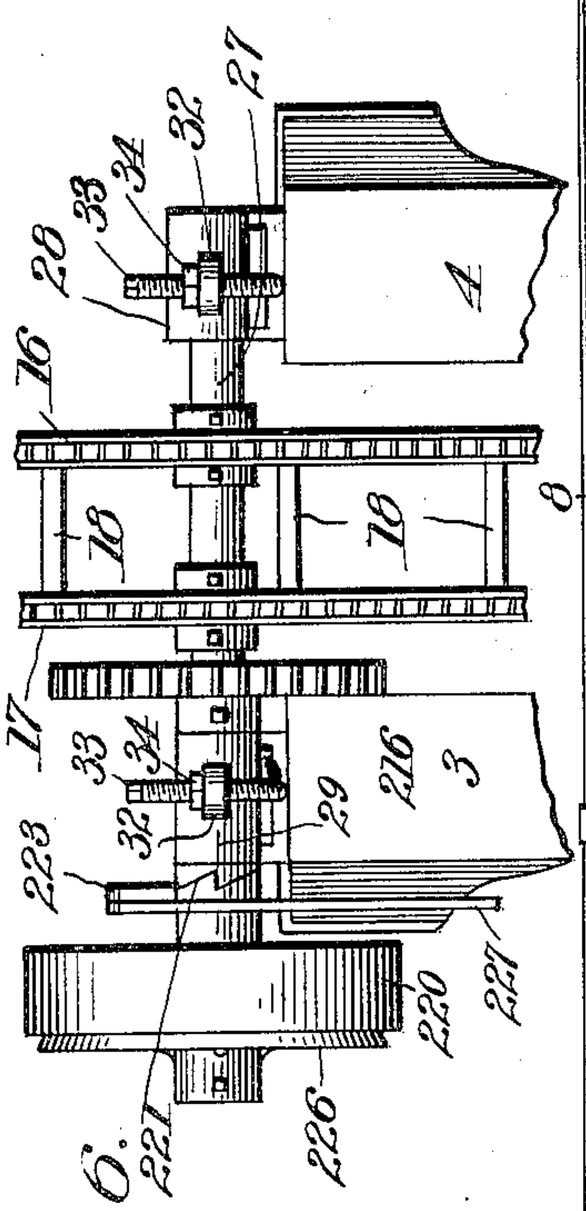

Fig. 6.

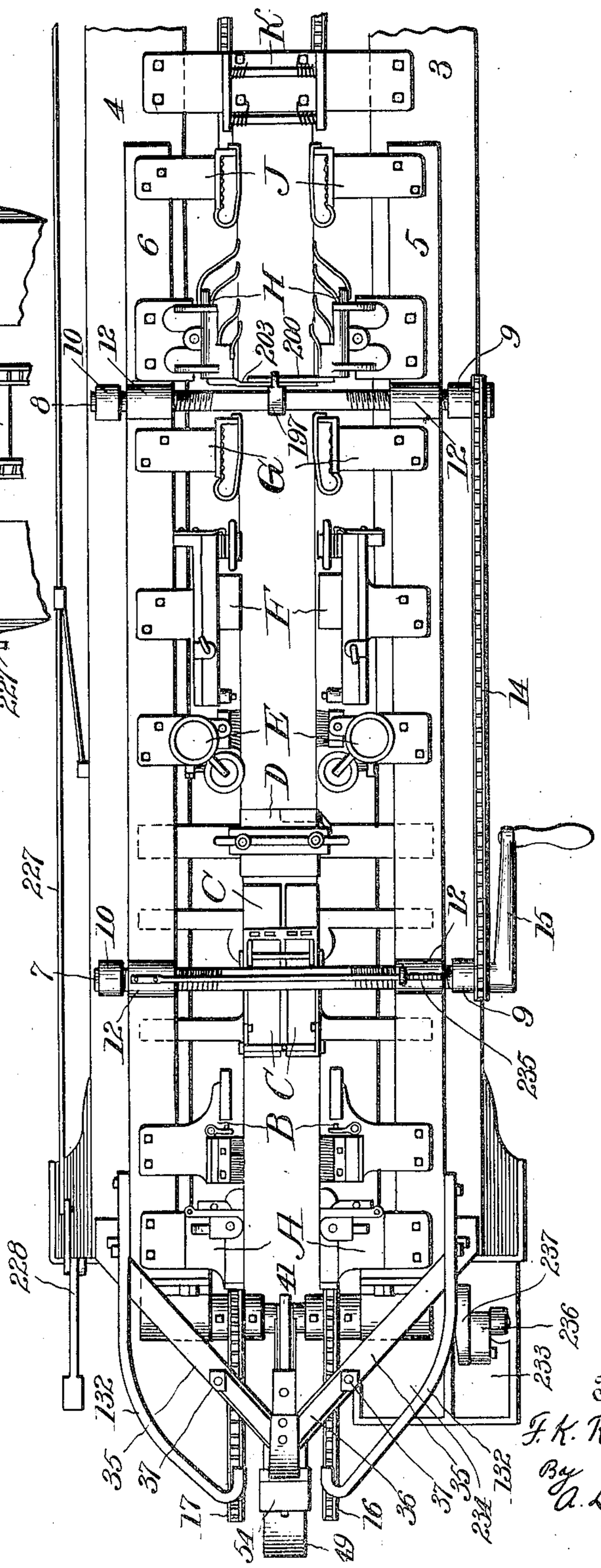

Fig. 5.

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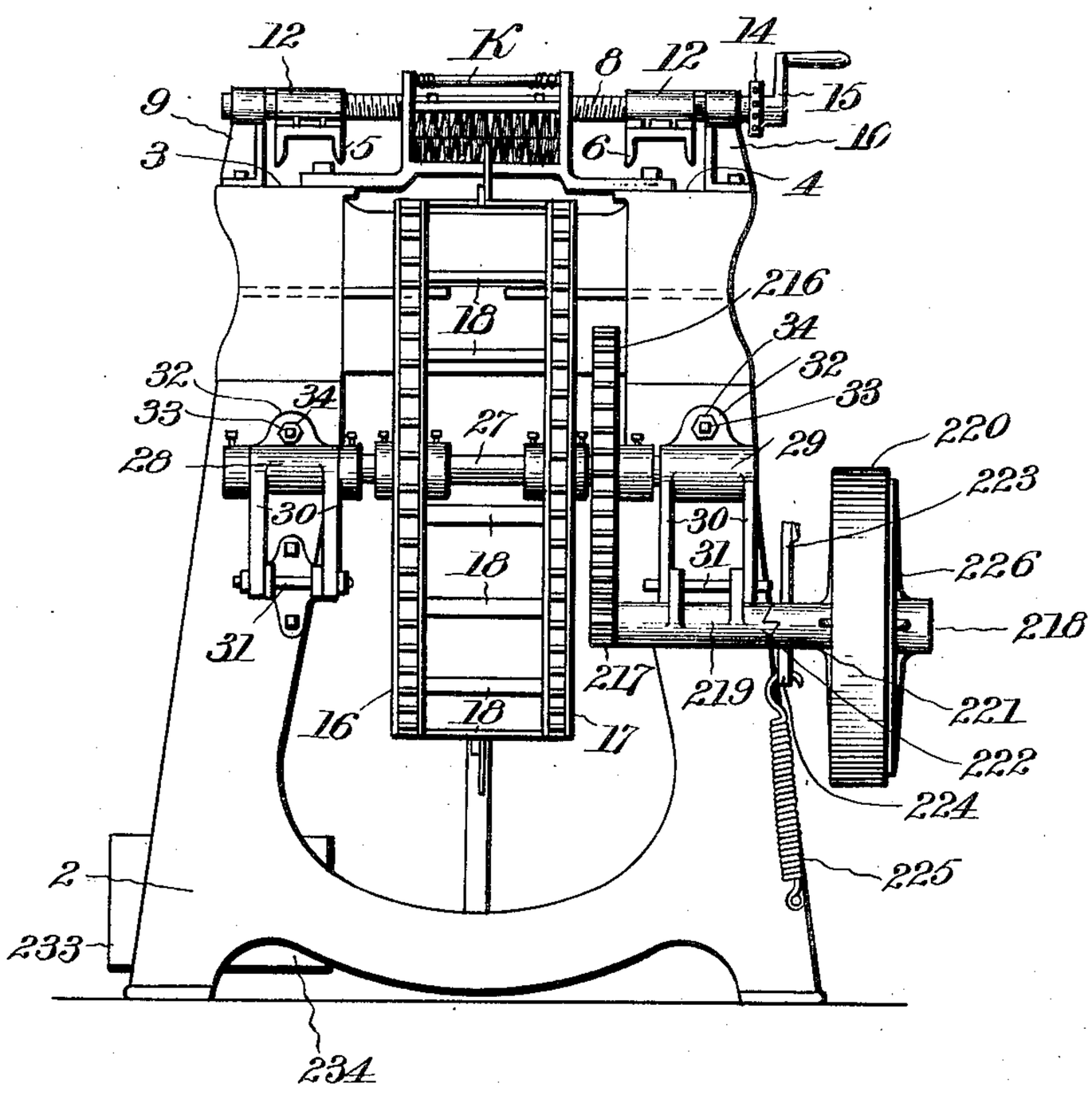
12 SHEETS—SHEET 3.

Fig. 7.



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12 SHEETS—SHEET 4.

Fig. 8.

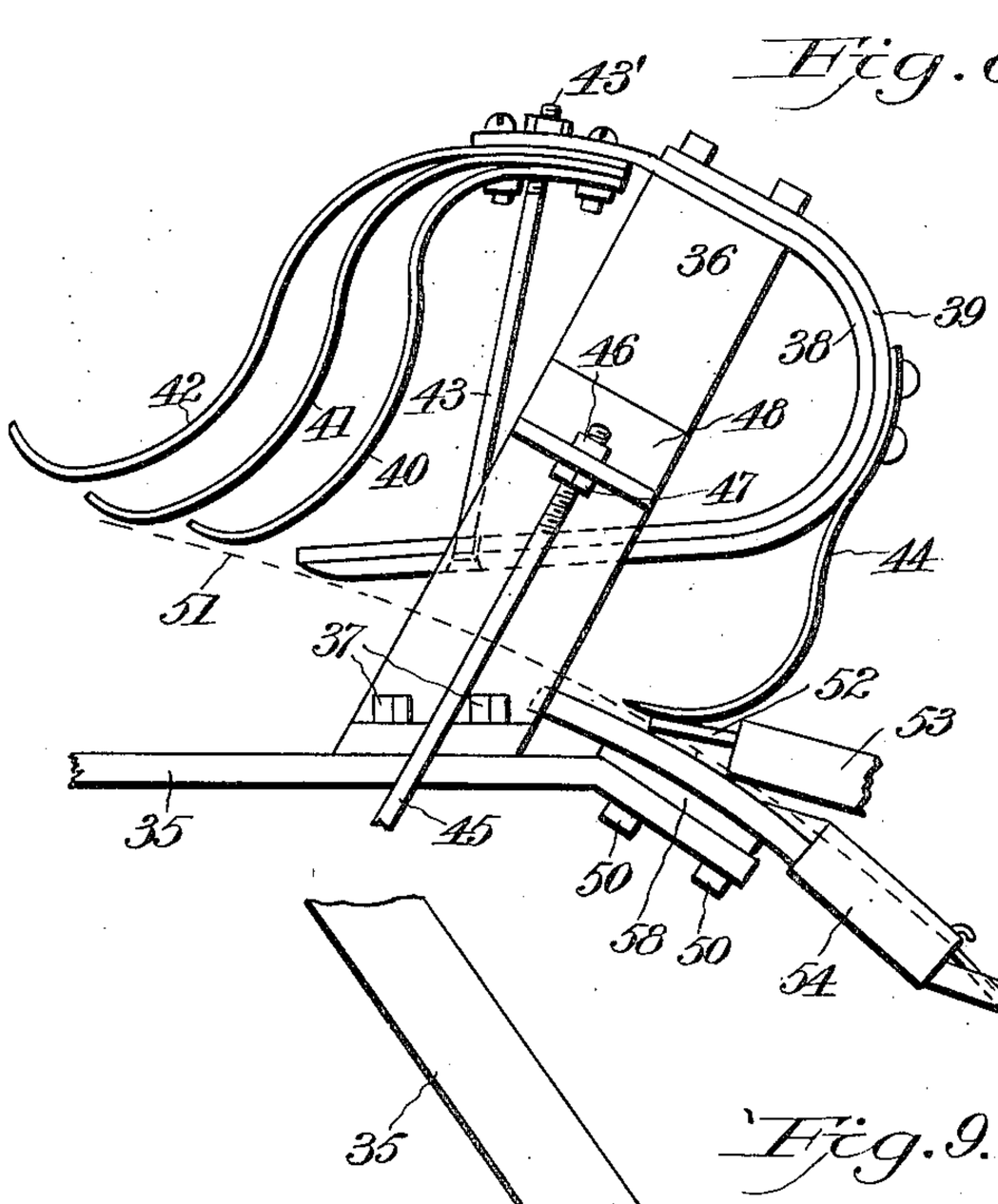


Fig. 9.

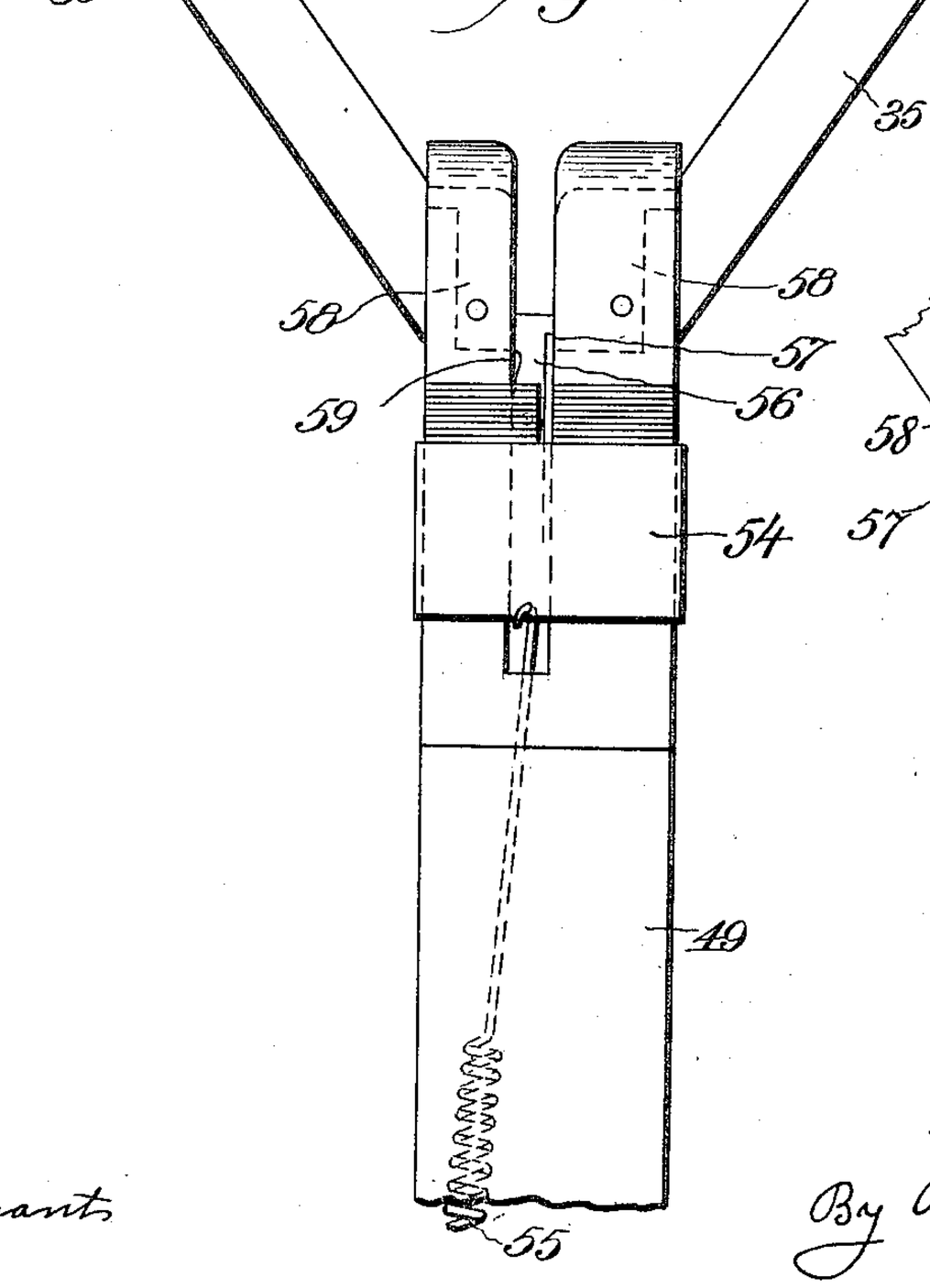
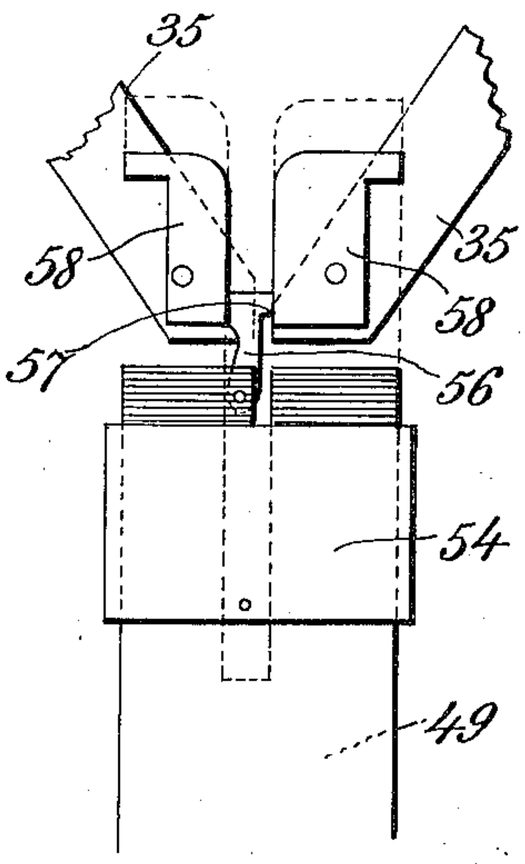


Fig. 9a.



Witnesses
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12 SHEETS—SHEET 5.

Fig. 10.

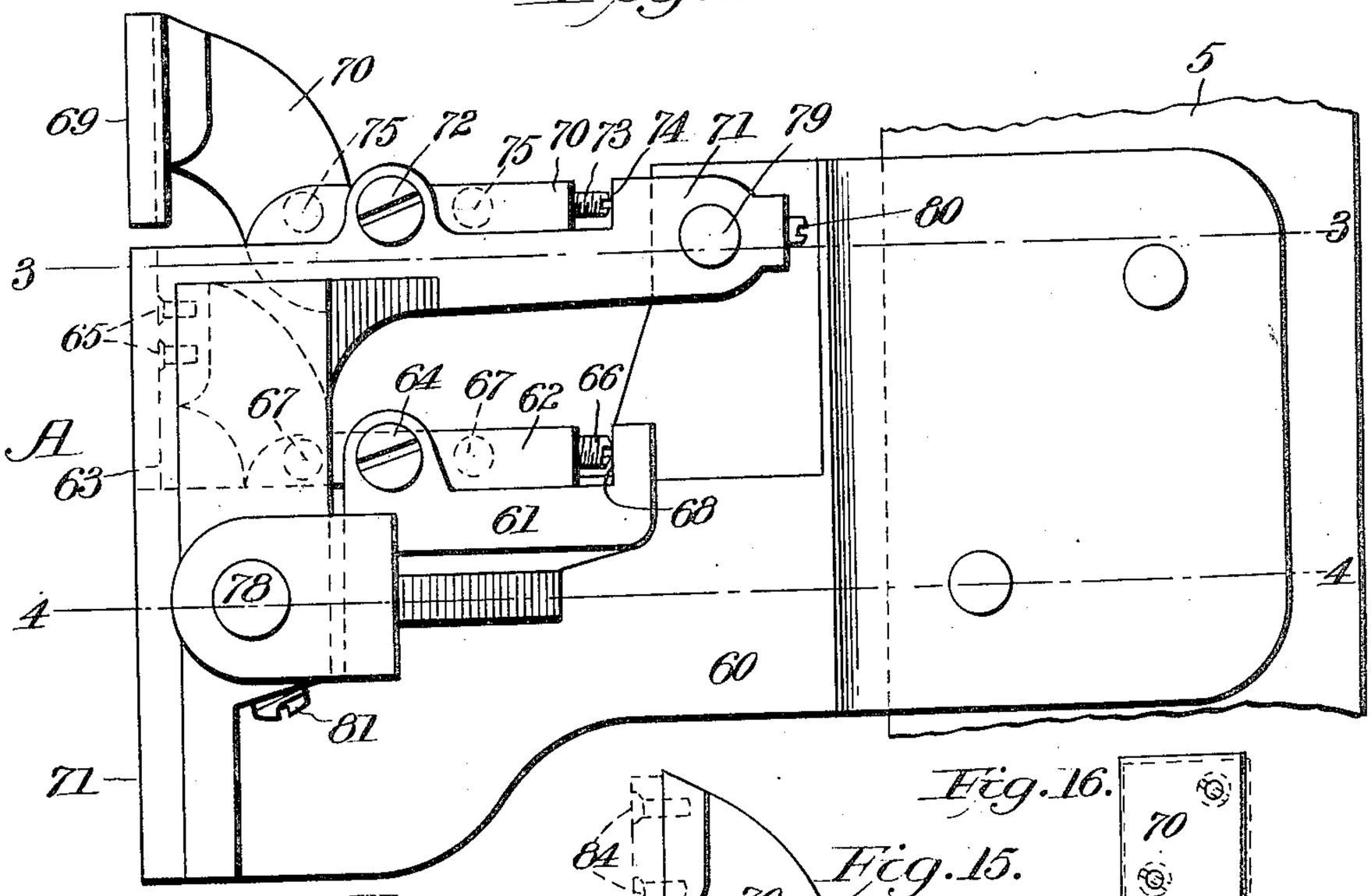


Fig. 11.

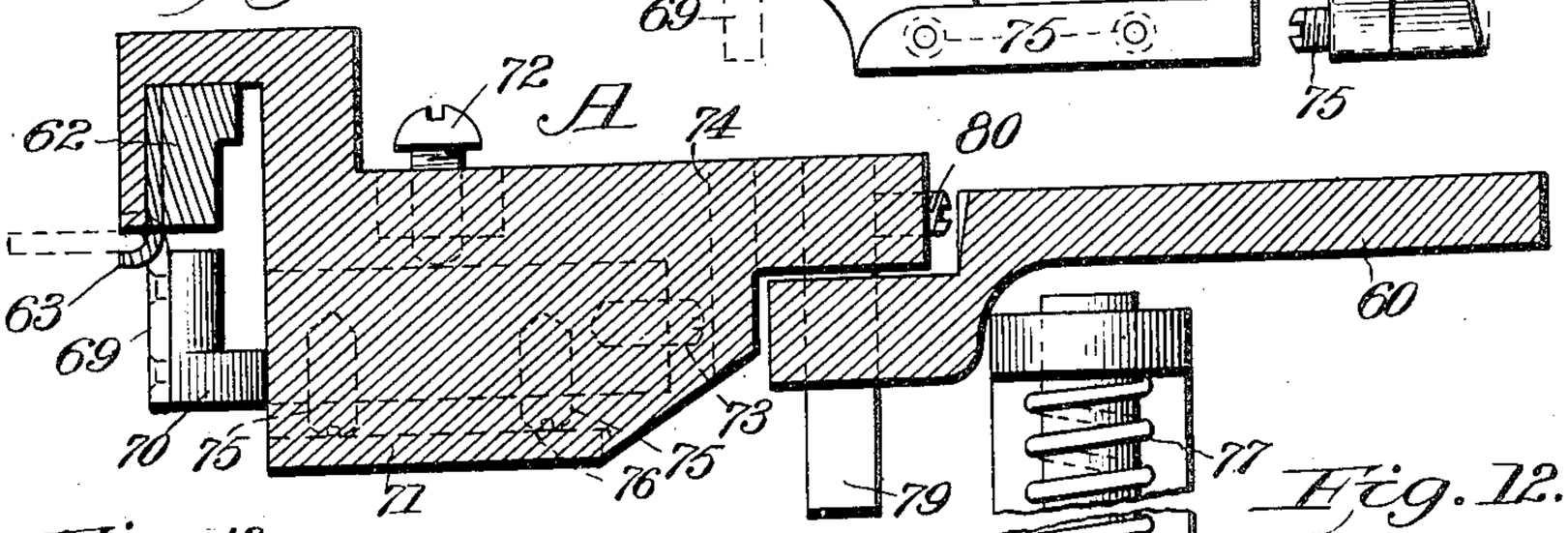


Fig. 12.

Fig. 16.

Fig. 15.

Fig. 13.

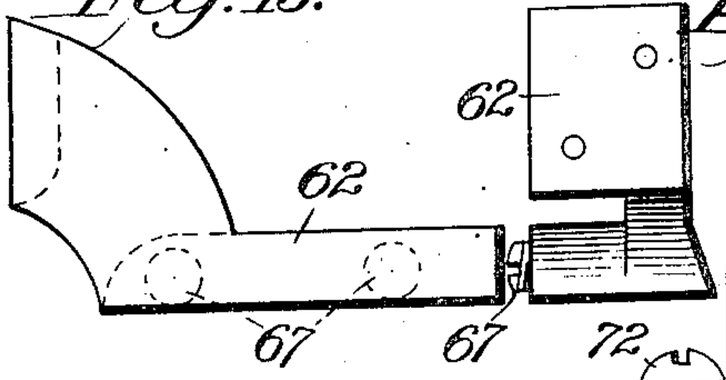
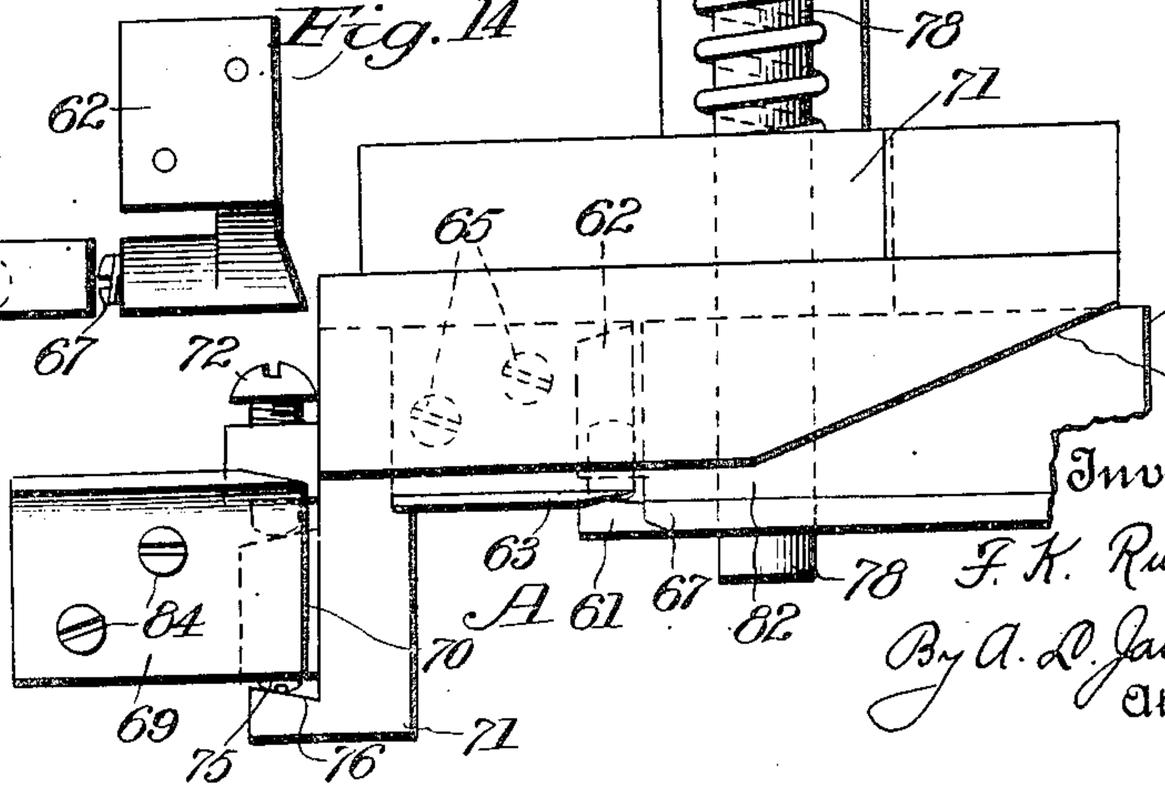


Fig. 14.



Witnesses

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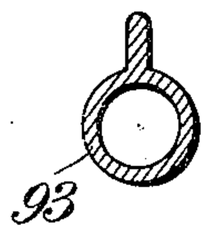
12 SHEETS—SHEET 6.

Fig. 22.



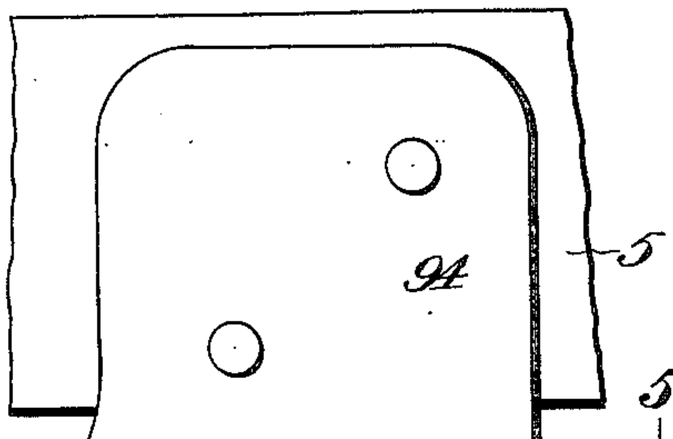
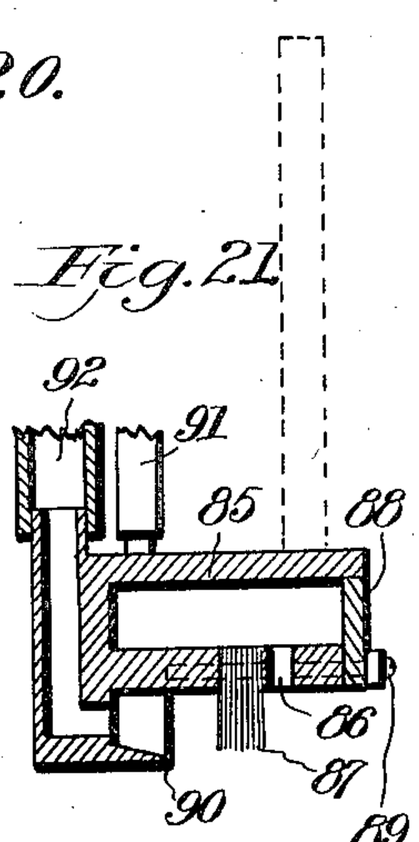


Fig. 20.

Fig. 21.



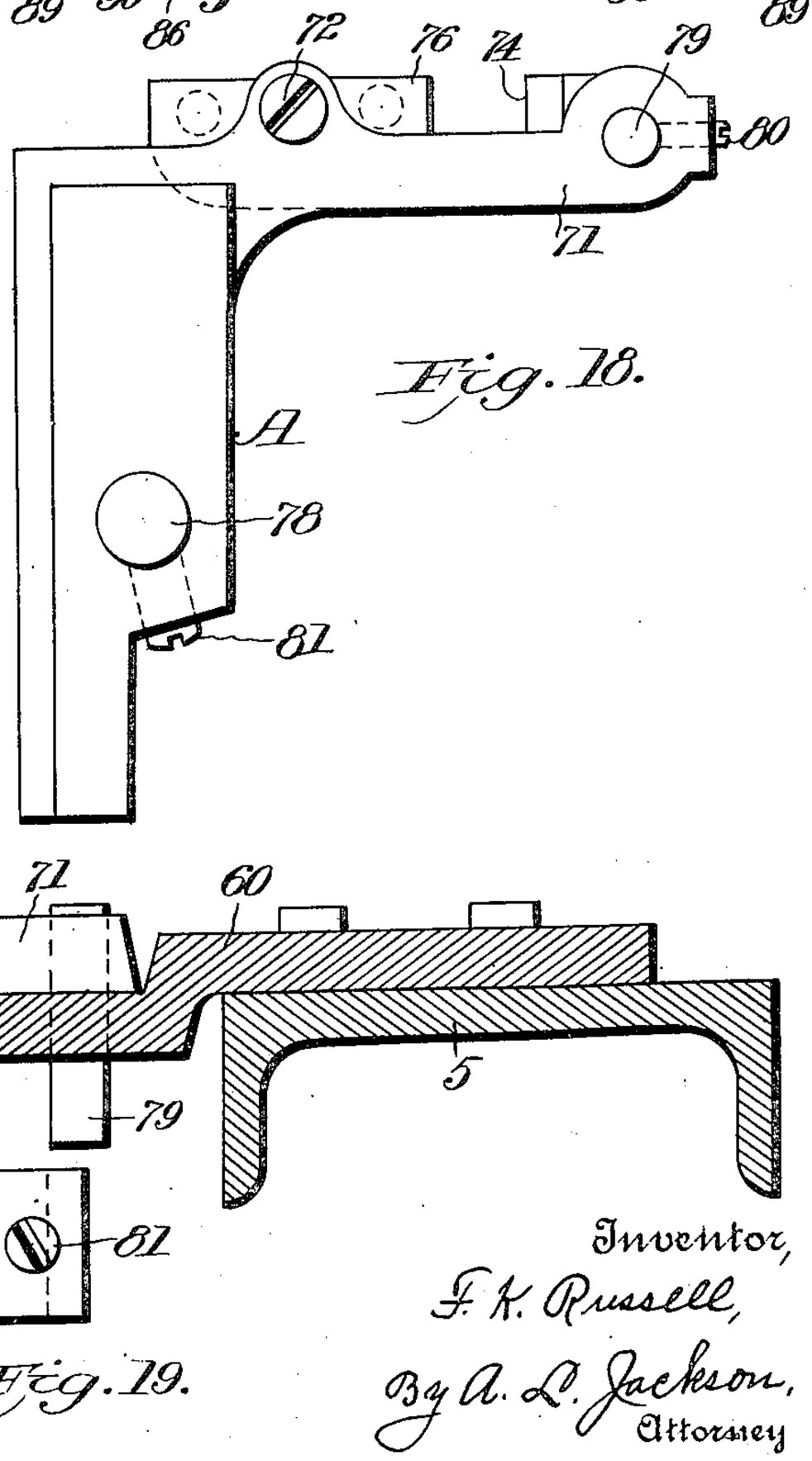


Fig. 17.

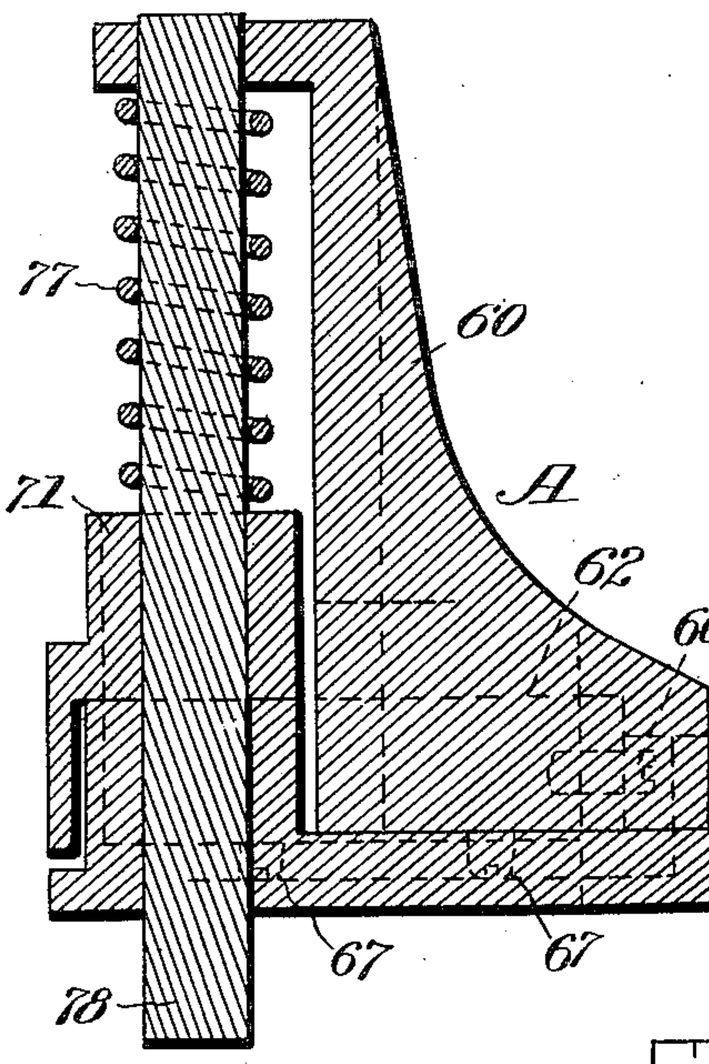


Fig. 18.

Fig. 19.

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12 SHEETS—SHEET 7.

Fig. 42.

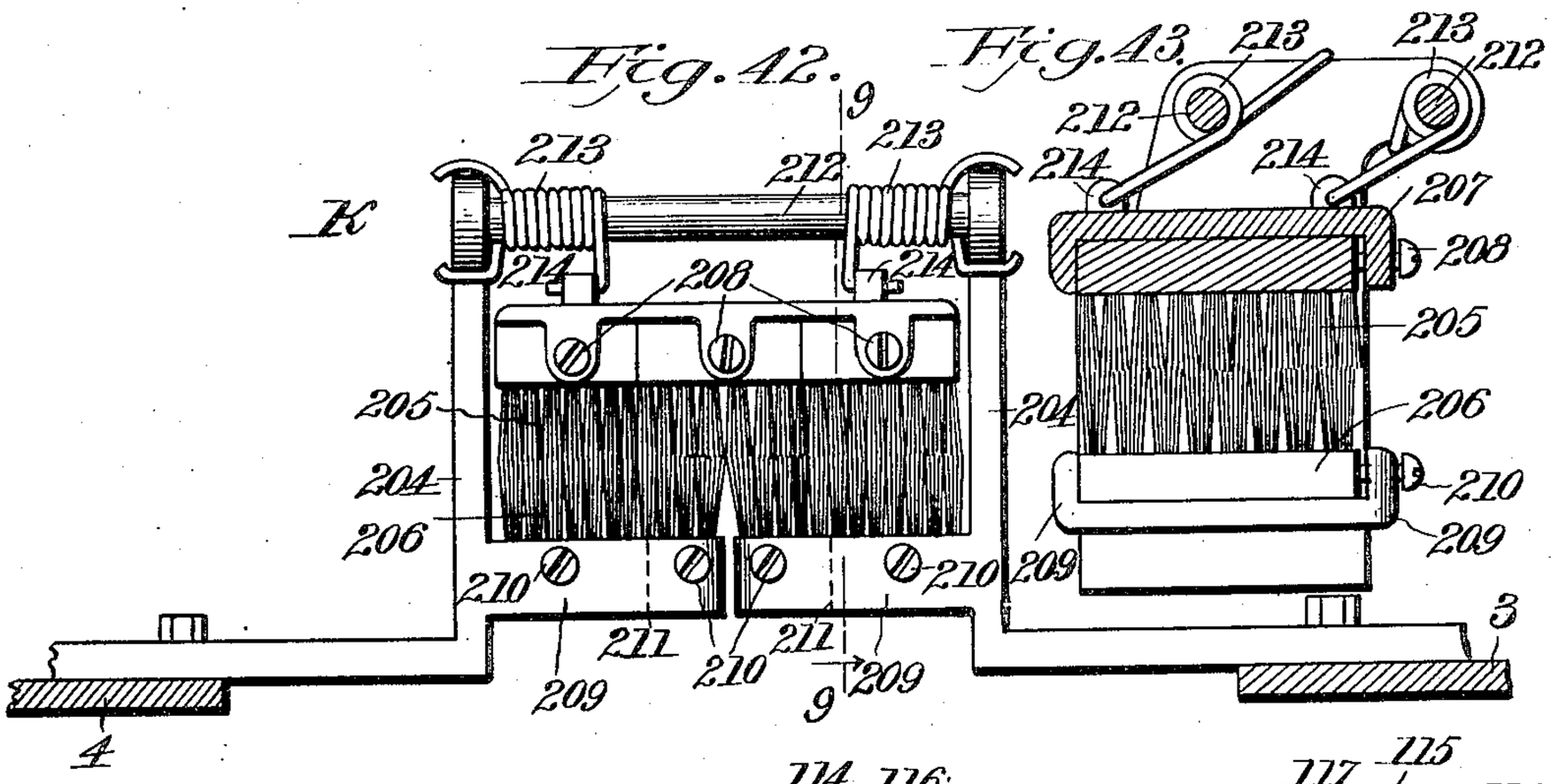


Fig. 43.

Fig. 23.

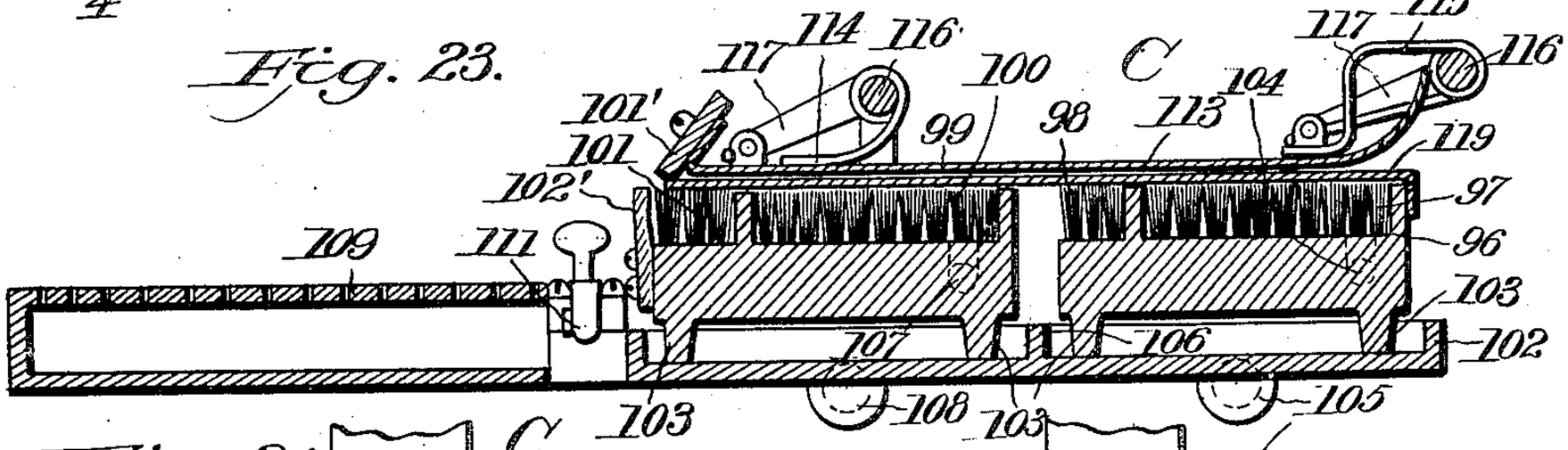


Fig. 24.

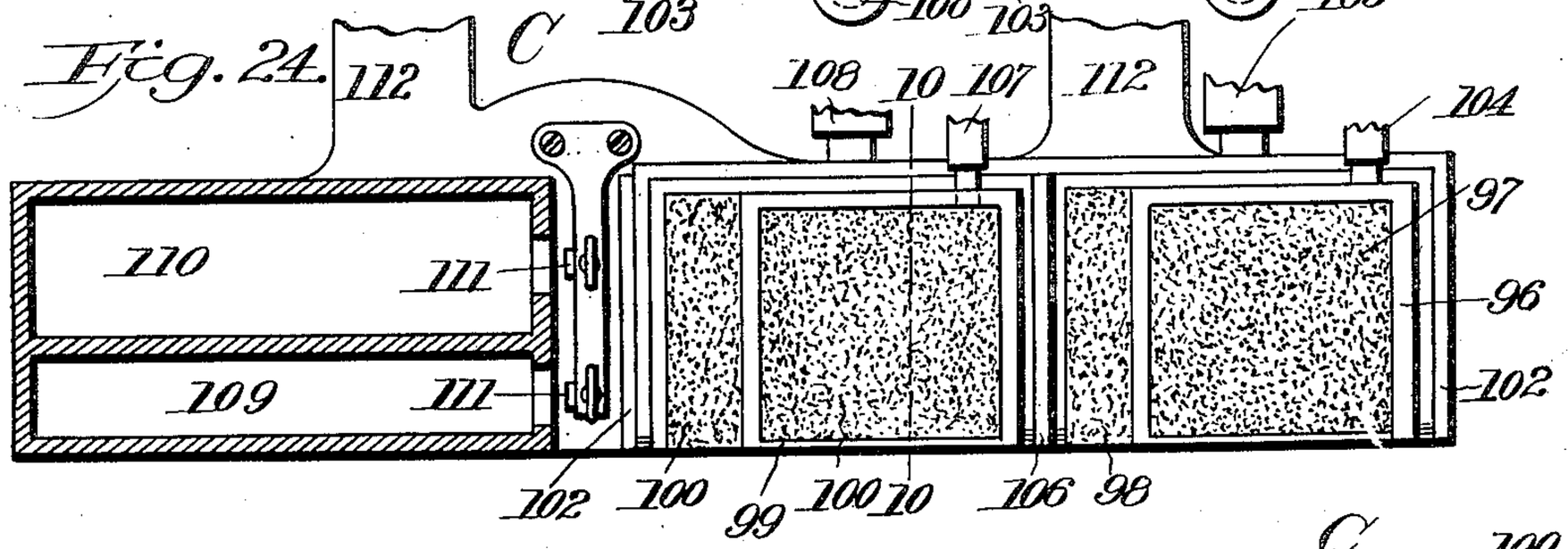


Fig. 25.

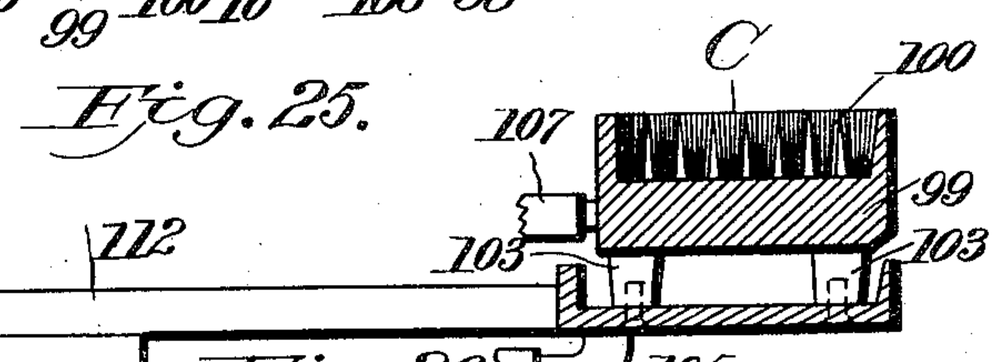
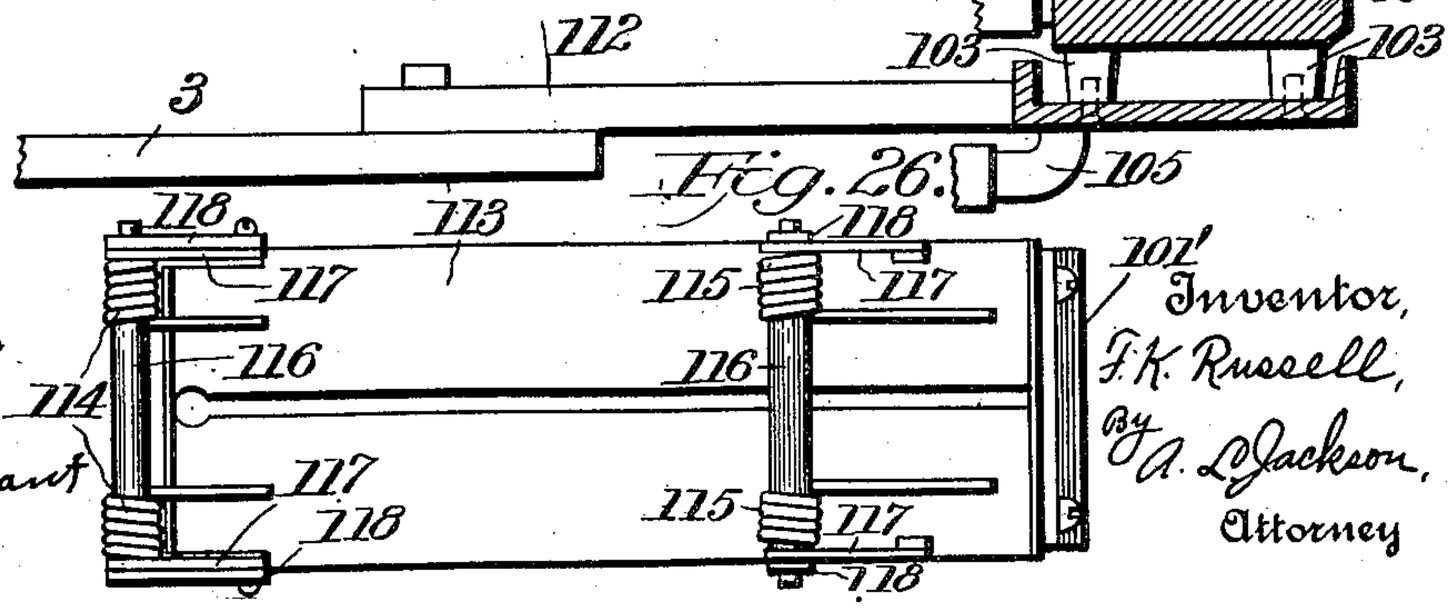


Fig. 26.



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12 SHEETS—SHEET 8.

Fig. 27.

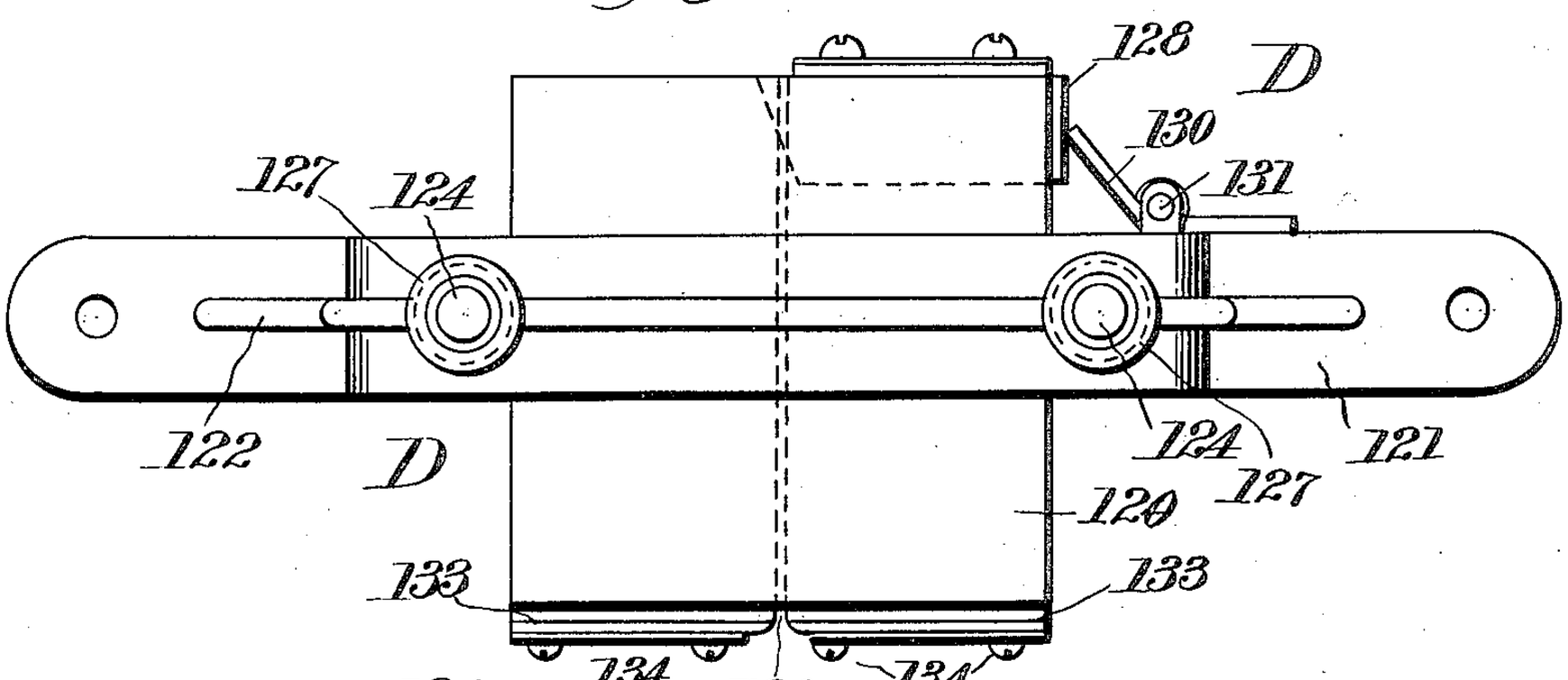


Fig. 28.

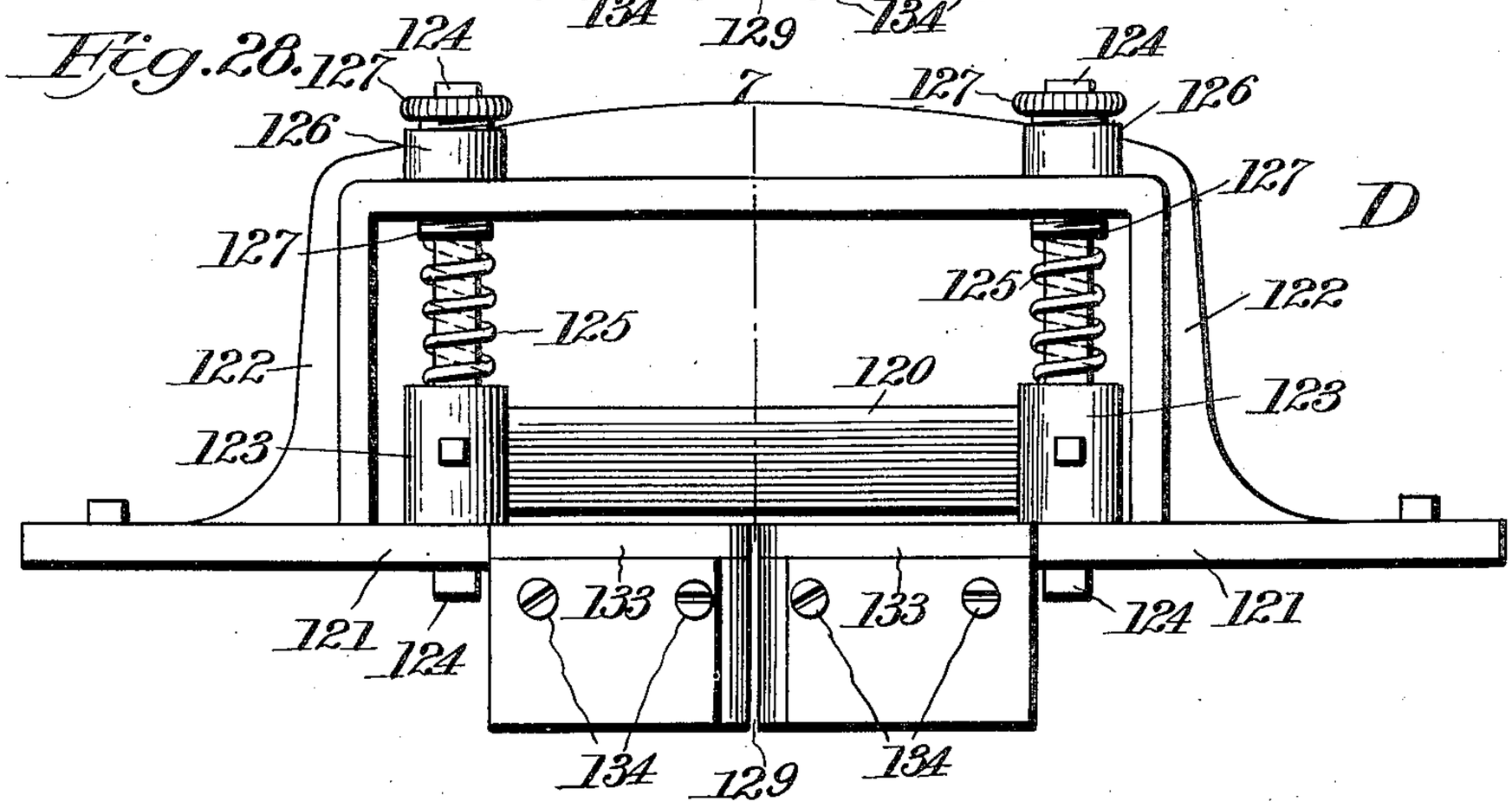
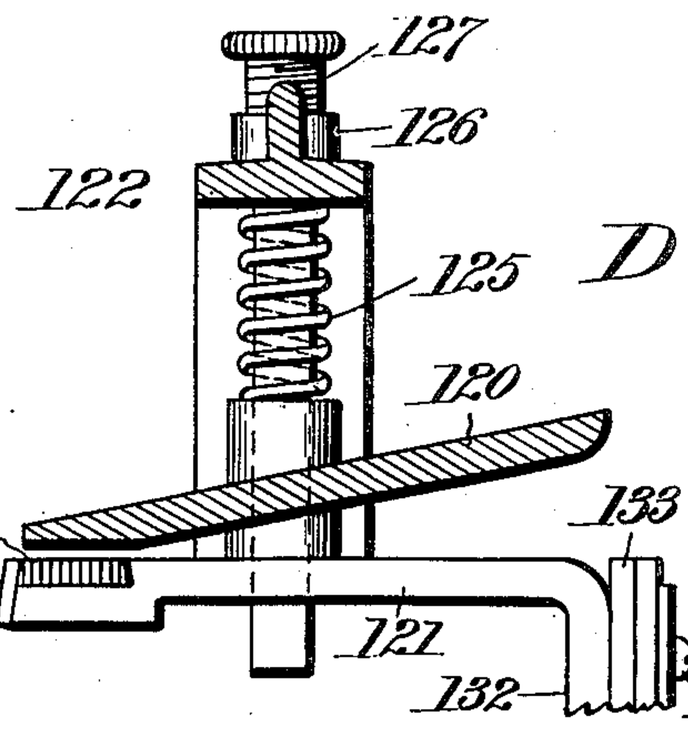


Fig. 29.



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12 SHEETS—SHEET 9.

Fig. 30.

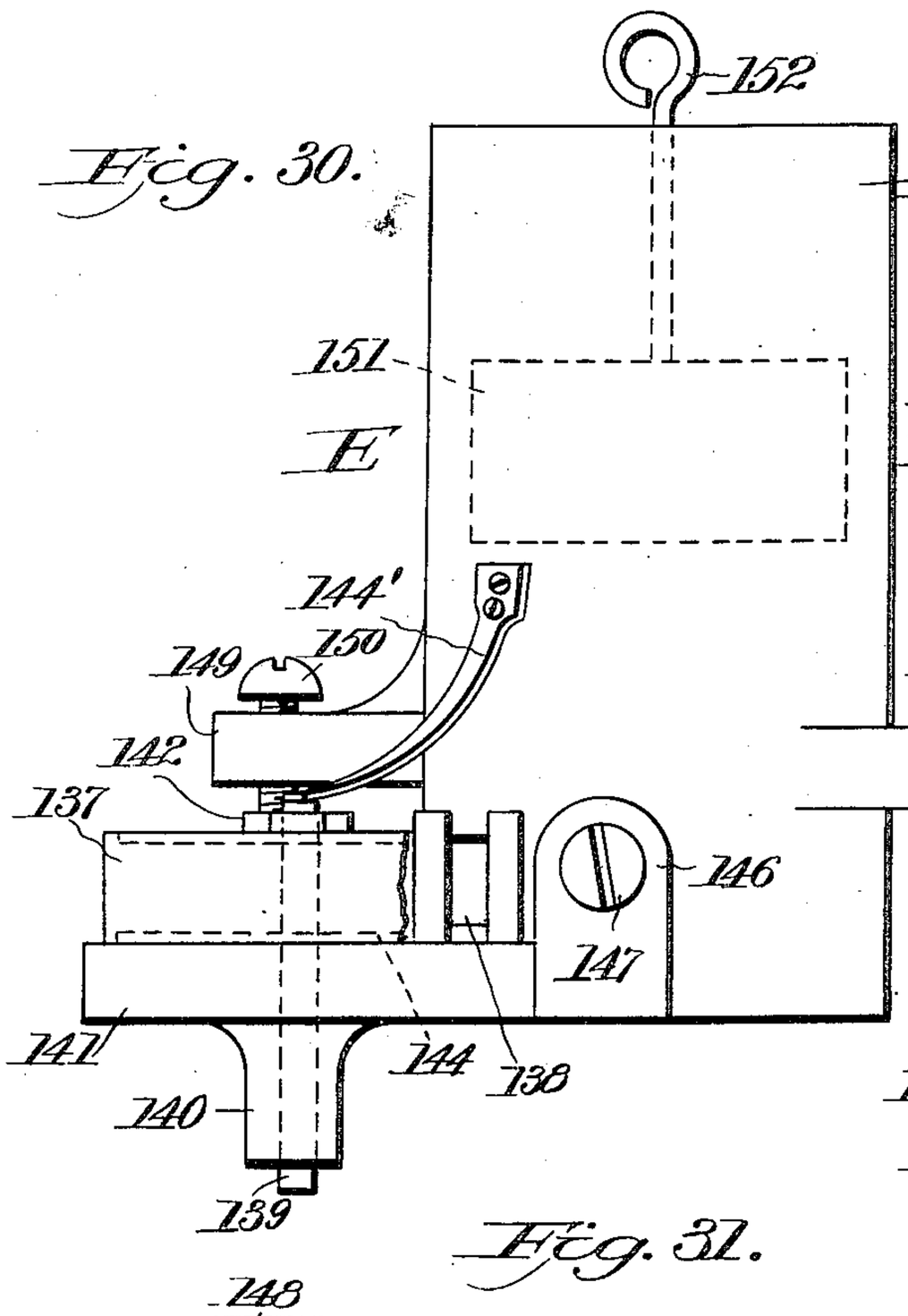

Fig. 32.

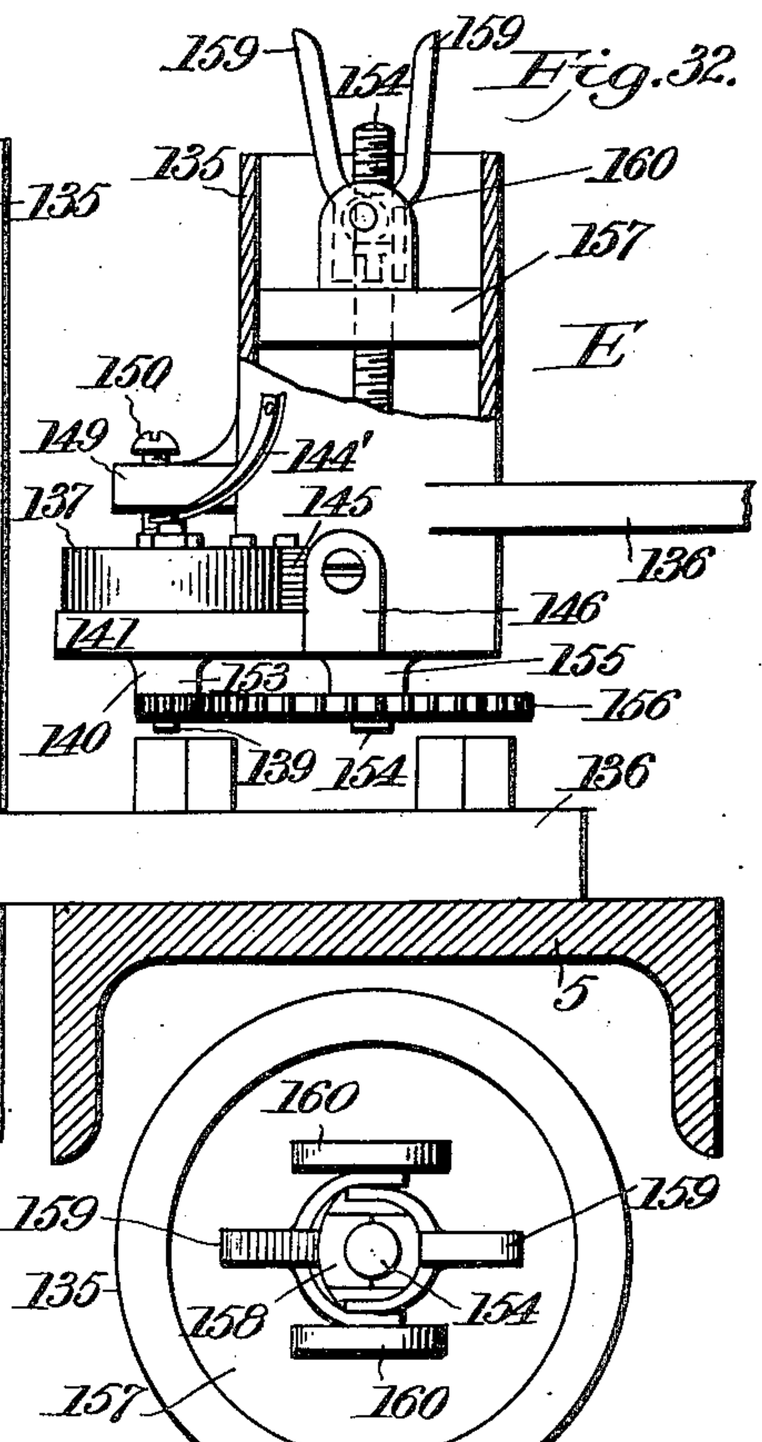

Fig. 31.

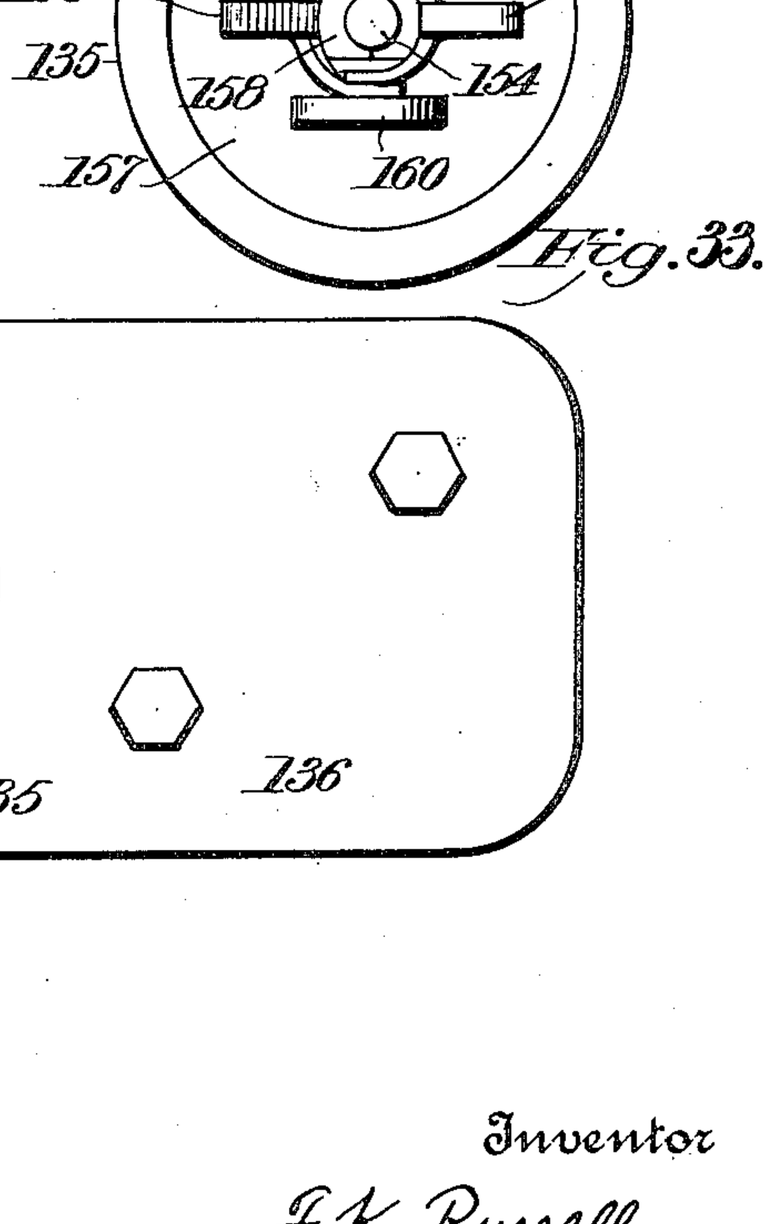

Fig. 33.

Witnesses

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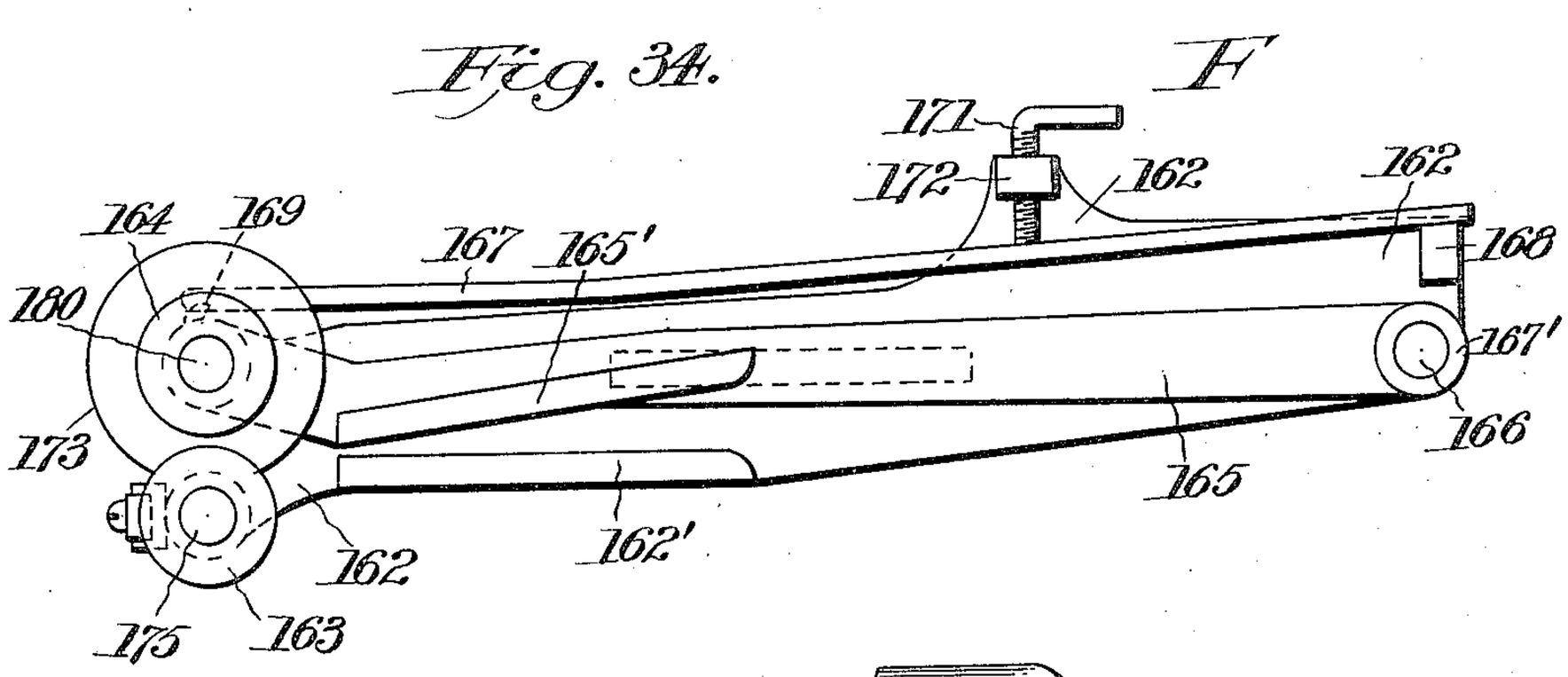
12 SHEETS—SHEET 10.

Fig. 34.



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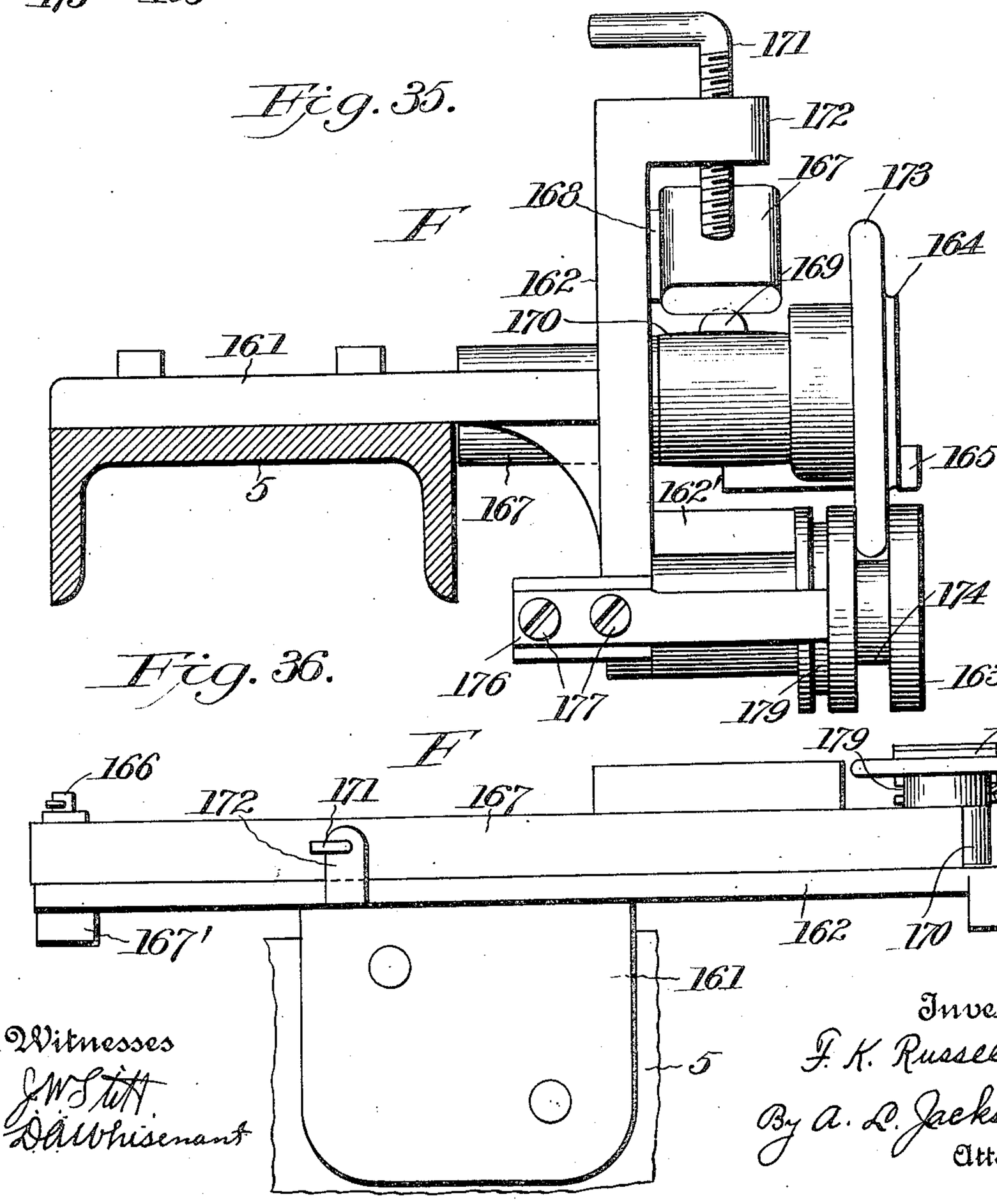

Fig. 36.

Witnesses

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LEATHER WORKING MACHINE.

APPLICATION FILED JUNE 3, 1904.

922,195. Patented May 18, 1909.

12 SHEETS—SHEET 11.

Fig. 37.

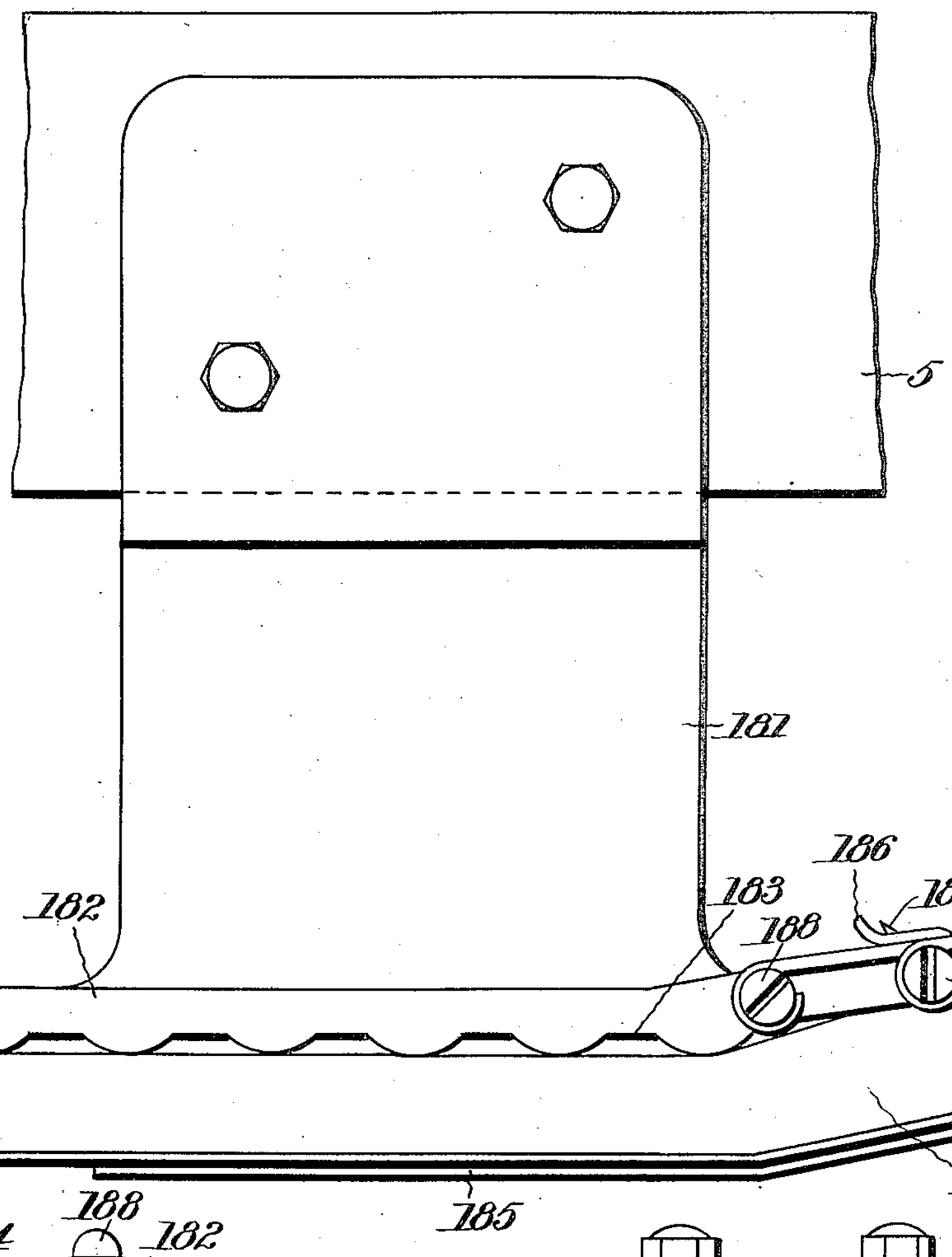

Fig. 38.

Witnesses

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922,195. Patented May 18, 1909.

12 SHEETS—SHEET 12.

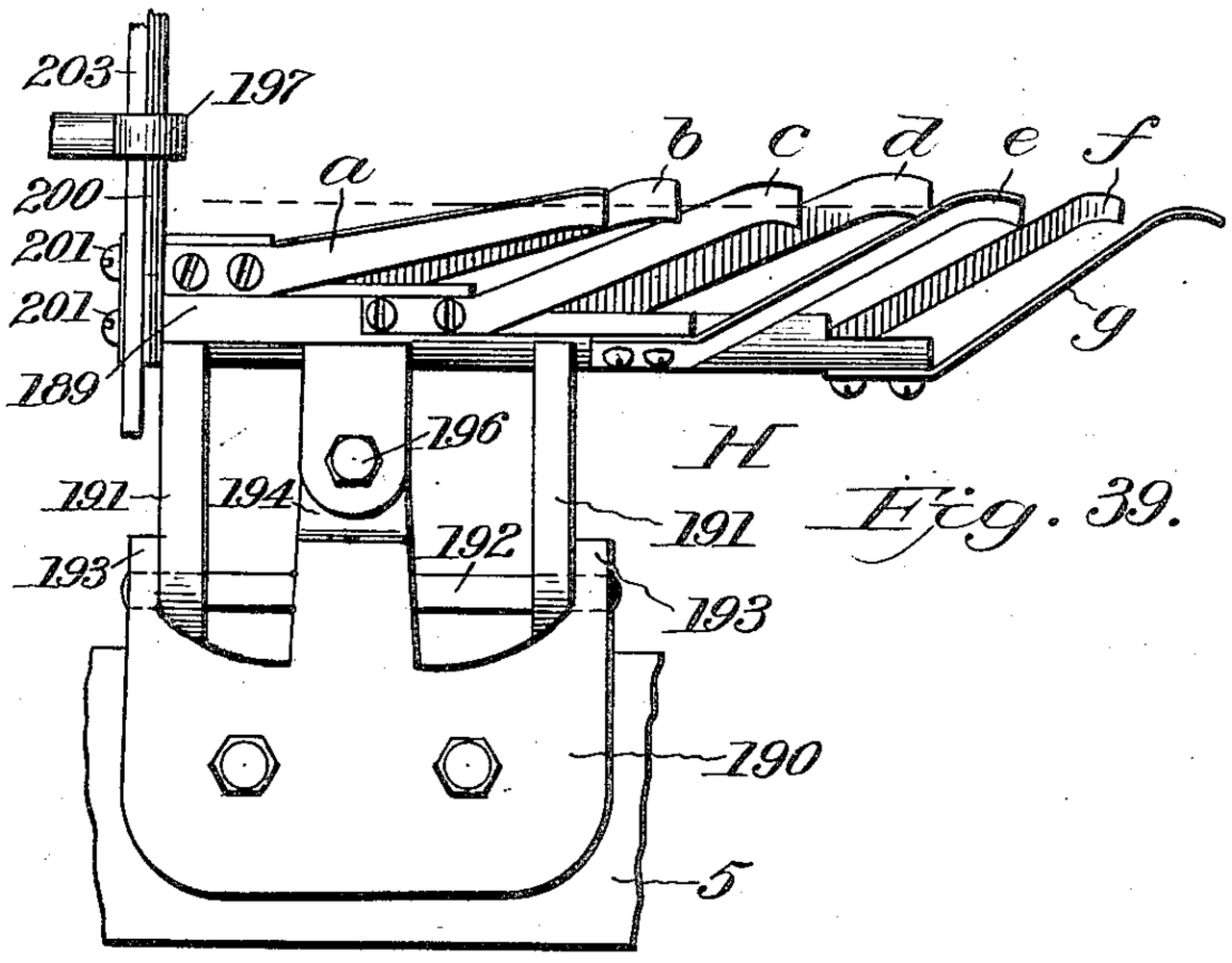

Fig. 39.

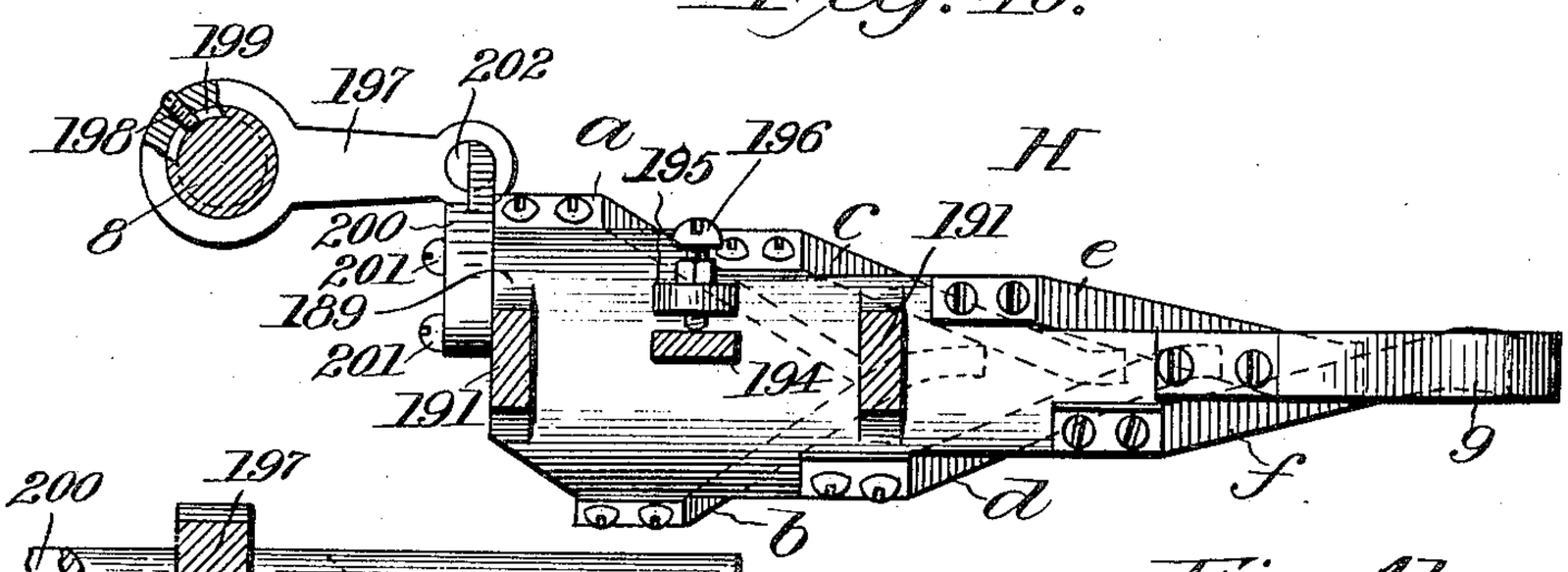

Fig. 40.

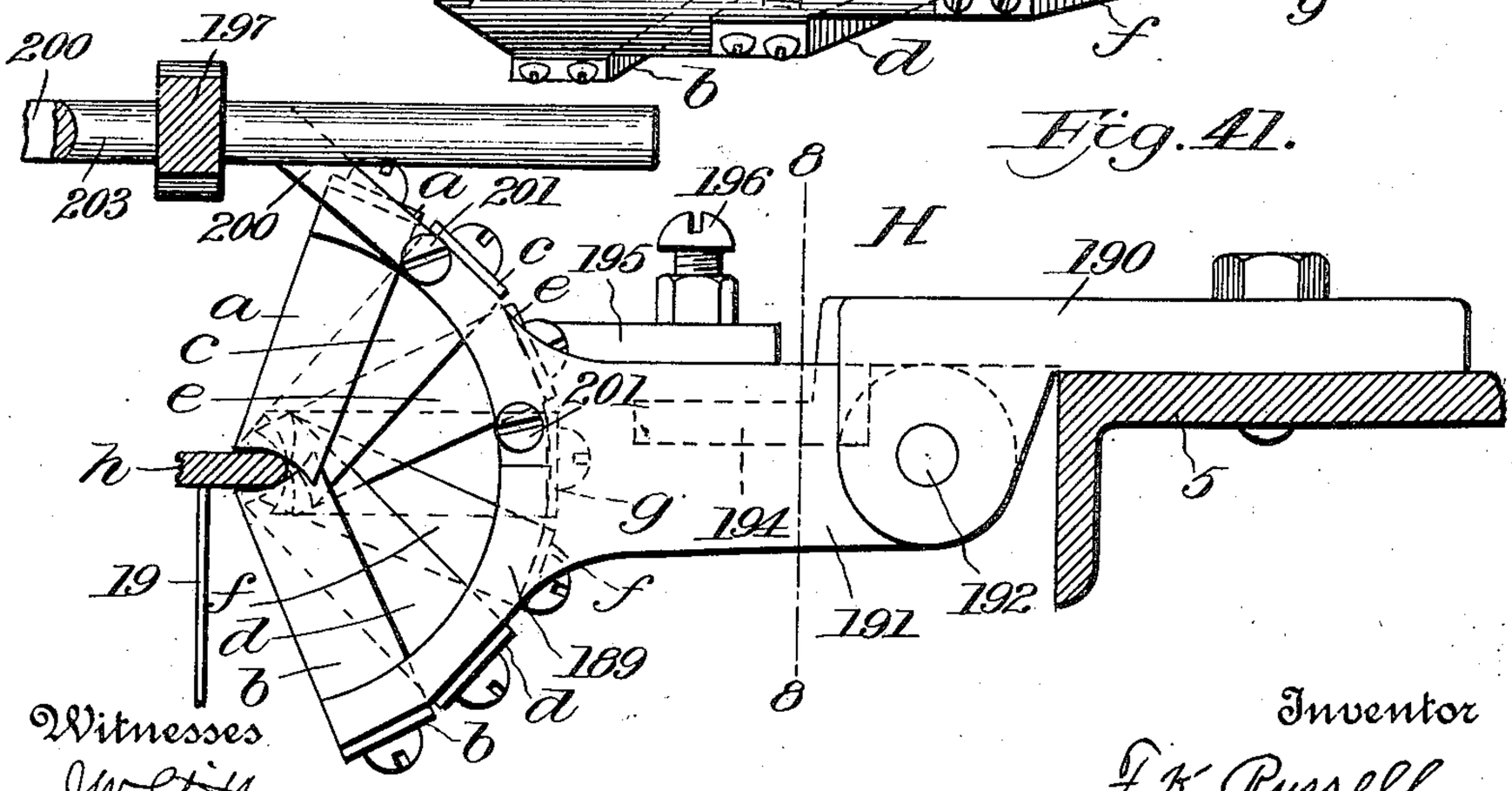

Fig. 41.

Witnesses

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UNITED STATES PATENT OFFICE.

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LEATHER-WORKING MACHINE.

No. 922,195. Specification of Letters Patent. Patented May 18, 1909.

Application filed June 3, 1904. Serial No. 211,049.

To all whom it may concern:

Be it known that I, FRANK K. RUSSELL, a citizen of the United States, residing at Dallas, Texas, have invented certain new and useful Improvements in Leather-Working Machines, of which the following is a specification.

This invention relates to leather-working machines, and particularly to machines for finishing straps, traces, and similar articles, and the object is to construct a machine which will, with one passage of the strap through the machine, perform the various operations set forth. After a strap has been cut out of a sheet of leather it is subjected to various treatments, and heretofore straps have been finished only after passing through a number of operations performed by hand by one or more persons. The edges of the strap must be trimmed and then blacked or stained. The blacking on the edges must be fixed. Heretofore no means for fixing the blacking has been necessary, because the time between successive operations was sufficient for the blacking to become fixed. The flesh side of a strap must be treated with a sizing solution which will prepare the strap for receiving the blacking; then the flesh side is blacked or stained. As before, the blacking on the flesh side must be fixed. Heretofore no means for fixing has been necessary, because the time between the operations was sufficient for the blacking to become fixed. Where the straps are finished by hand, the blacking will have time to become fixed before the next operation. In a machine which finishes the strap in one operation, something is necessary to fix the blacking on certain kinds of leather. The grain and flesh side of a strap are made smooth. The filler is applied to the edges of the strap. The strap is then ready to be creased, or, if round edge is desired, they are rolled with suitable rollers instead of creasing. After creasing, the edges must be rubbed to even out the filler and smooth them. A subsequent operation is necessary to make the edges compact and smooth. The edges are then again rubbed to make a more complete finish. After all this is done, the entire strap is finally rubbed for the purpose of cleaning same. I have prepared a machine for accomplishing all these objects or operations in a single operation.

Other objects and advantages will be explained in the following description, and the invention will be more particularly pointed out in the claims.

Reference is had to the accompanying drawings, which form a part of this application.

The most of the mechanism which operates on straps is made in pairs, rights and lefts. In the detailed views only one of each pair of elements will be illustrated and described.

Figure 1 is a side elevation of the entire machine, showing as many parts thereof as is practical to show in one view. Fig. 2 is a broken plan view of the sprocket chains and the feeder carried by the sprocket chains. Fig. 3 is a cross section taken substantially on line 2—2 of Fig. 2. Fig. 4 is a side elevation of the feeder. Fig. 5 is a plan view of the machine partly broken away, all of the upper operative mechanism being shown in this view. Fig. 6 is a continuation of Fig. 5, a part of the sprocket chains and wheels being broken away at the rear end of the machine. Fig. 7 is a rear end elevation with the guard removed. Fig. 8 is a side elevation of the receiving and starting mechanism. Fig. 9 is a broken plan view of the receiving and starting mechanism. Fig. 9ª is a similar view with the element 49 shown in dotted outline. Fig. 10 is a plan view of one side of the trimmer. Fig. 11 is a vertical cross-section along the line 3—3 of Fig. 10. Fig. 12 is an inside elevation of the device shown in Fig. 10 looking at the left side of Fig. 10, Fig. 10 showing the right side of the trimming mechanism. Fig. 13 is a plan view of the blade carrier for trimming the lower edge of the strap. Fig. 14 is an end view of the same, as seen from the left of Fig. 13. Fig. 15 is a plan view of the blade carrier for trimming the upper edge of the strap, the blade being shown in dotted outline. Fig. 16 is an end view of the same, as seen from the left of Fig. 15, the position of the blade being shown by dotted outline. Fig. 17 is a vertical section along the line 4—4 of Fig. 10. Fig. 18 is a plan view of the frame which carries one of the blade carriers, the blade carrier for trimming the upper edge of the strap, showing the guide-rods. Fig. 19 is an end view of the lower part of Fig. 18. Fig. 20 is a plan view of the blacking and heating mechanism for fixing the ink on the edge of the strap, the heating mechanism be-

ing shown in horizontal section. Fig. 21 is a section of the blacking mechanism taken along line 5—5 of Fig. 20, the parts being shown in the same plane as the corresponding parts of Fig. 20. This Fig. 21 is shown as if the device was cut in two parts and turned one quarter over. Fig. 22 is a cross-section along the line 6—6 of Fig. 20. Fig. 23 is a vertical longitudinal section of the mechanism for blacking the bottom or flesh side of the strap. Fig. 24 is a plan view of the same with the heating mechanism shown in horizontal sections, the frame part for attaching the machine being broken away and the top part of the blacking mechanism being removed. Fig. 25 is a vertical cross-section of the same along the line 10—10 of Fig. 24. Fig. 26 is a plan view of the parts removed from Figs. 24 and 25. Figs. 24 and 25 are for the right half of the mechanism, and Fig. 26, on a smaller scale, is the upper mechanism for both the right and the left half. Fig. 27 is a plan view of the smoother for the top and bottom of the strap. Fig. 28 is a front elevation of the same. Fig. 29 is a vertical section along the line 7—7 of Fig. 28. Fig. 30 is a front elevation of the right hand filler applying mechanism, the filler wheel being broken slightly away and the smoothing brush being removed. Fig. 31 is a plan view of the complete device for the right hand side. Fig. 32 is a vertical section, on a small scale, of a variation of the device shown in Fig. 30. Fig. 33 is a plan view of the filler-containing receptacle, shown in Fig. 32, but on a larger scale. Fig. 34 is a side elevation of the right side creasing mechanism. Fig. 35 is a rear elevation of same on a larger scale. Fig. 36 is a plan view of same. Fig. 37 is a plan view of the right side edge-rubbing device. Fig. 38 is a front elevation of same. Fig. 39 is a plan view of the right side edge smoothing device. Fig. 40 is a vertical section along the line 8—8 of Fig. 41. Fig. 41 is a front view, on a larger scale, of the device shown in Figs. 39 and 40. Fig. 42, Sheet 7, is a front view of the final cleaning device. Fig. 43 is a vertical section along the line 9—9 of Fig. 42.

Similar characters of reference are used to indicate the same parts throughout the several views.

The machine hereinafter described is adapted to finish a strap of any ordinary dimension by one passage of the strap through the machine. The machine is provided with a stationary frame, and an adjustable frame which is composed of two parts laterally adjustable. The stationary frame consists of end-supports 1 and 2 which extend transversely at the ends of the frame and are similar to each other, and of two castings, 3 and 4, each forming a side and a portion of the top of the frame. The relative position of the frame-pieces 3 and 4 is shown in Figs. 5 and 6. The adjustable frame consists of two parts 5 and 6. The adjustable frame is suspended on two shafts 7 and 8, which shafts are mounted in and supported by bearings 9 and 10, which bearings 9 and 10 are attached to the frame pieces 3 and 4 of the stationary frame. The frame pieces 5 and 6 are suspended on shafts 7 and 8 by means of bearings 12, which may be formed integral with the frame pieces 5 and 6, or they may be bolted thereto by suitable bolts. The bearings 12 are interiorly threaded, and the shafts 7 and 8 are provided with threads adapted to mesh with the threads of bearings 12. The threads on the ends of the shafts 7 and 8 run in opposite direction, constituting right and left screws or screw shafts. Sprocket wheels 13 are mounted on shafts 7 and 8, and a sprocket chain 14 is mounted on the wheels 13. The shaft 7 is provided with a crank 15 for driving this shaft. When the shaft 7 is driven, the shaft 8 is driven by sprocket chain 14. By reason of the threads on these shafts and the interior threads of the bearings 12, the frame pieces 5 and 6 are made movable from and toward each other, or, in other words, the frame pieces 5 and 6 are laterally adjustable. Most of the operative mechanism is mounted on the movable frame pieces 5 and 6. Most of the operative elements are made in pairs, a right and a left side, and the right side is mounted on one of the adjustable frame pieces, and the left side is mounted on the other adjustable frame piece, consequently the right and left operative elements are laterally adjustable toward and from each other. In the drawings the frame piece 6 is considered the left side and the frame piece 5 is considered the right side. In Fig. 5 the part of the figure to the left is the front end of the machine. In Fig. 1 the part of the figure to the right is the front end of the machine. The rear end of the machine is shown in Fig. 7 as a rear end elevation with the guard removed. The rear end of the machine is shown in Fig. 6 in plan view and is shown in Fig. 1, the left part of the figure in side elevation.

The straps are carried through the machine by means of feeders, which are mounted on two sprocket chains, which are provided with suitable sprocket wheels at each end of the machine. The sprocket chains 16 and 17 are connected together by suitable bars 18. The bars 18 support the strap as the same passes around the rear end of the machine, and hold the strap in line for the feeding device, which is carried by the sprocket chain. The feeder 19 is mounted on the sprocket chains, as shown in Figs. 2 and 3. The feeder 19 is attached to a rod or bar 20. This rod is journaled in bearing lugs 21 and 22 which are mounted on the bars 18^1. A portion of the bar or rod 20 is provided with two flat faces 24 and 25. A spring 26 is at-

tached to the rod or bar 18[1] and presses on either face 24 or 25. The spring 26 normally presses on the face 25 with sufficient force to hold the feeder 19 at upright or right angles to the sprocket chains, as shown in Fig. 1 and Figs. 2 and 3. The feeder is thus carried through the machine. The object in having the feeders pivotally mounted is, that the feeder, when not in use, may be turned down to one side against the outside of the sprocket chain, as shown by dotted outline in Fig. 2. The spring 26 is adapted to hold the feeder in either position. The real object of this provision is that when very long straps are being operated upon, the feeders not in use, which would travel in the path or beat of the strap, may be turned down to the plane of the sprocket chain so that the feeders will not mutilate the strap, the feeder being provided with teeth for engaging the straps.

The tension of the sprocket chain is regulated at the rear end of the machine. The shaft 27, on which the sprocket wheels for chains 16 and 17 are mounted, is journaled in adjustable bearings 28 and 29. The bearings 28 and 29 are provided with legs 30, which are pivotally mounted on bars or rods 31, and the bearings 28 and 29 are provided with upwardly extending ears 32. Screws 33 are mounted in the frame piece 2 and project through these ears, and are provided with nuts 34 by which the bearings 28 and 29 may be adjusted to regulate the tension of the sprocket chains 16 and 17.

The mechanism for receiving and starting a strap in the machine is shown at the right side of Fig. 1, at the left side of Fig. 5, and the detailed view of Figs. 8 and 9. The receiving and starting mechanism is mounted on bars 35 which are attached to the stationary frame. A bow 36 is mounted on the bars 35 and bolted thereto by bolts 37. Springs 38 and 39 are bolted to the bow 36, and curved under the bow 36, as shown in Figs. 1 and 8. The spring 38 is extended forward of the bow 36. Three springs, 40, 41, and 42, are attached to the spring 38, and a rod 43 connects the forward end of spring 38 with the two springs 38 and 39, as shown in Fig. 8. The ends of these springs constitute bars for pressing the straps on the feeders, and are held just above the path of the straps by the rod 43 which is adjustable by the nut 43[1]. These bars have upward yielding motion to permit the passage of straps of different thicknesses. A starting spring 44 is bolted to spring 39, as a guide for starting the strap into the machine. This spring 44 will keep the strap pressed down until the feeder, carried by the sprocket chain, takes hold of the strap. The bow 36 is braced on each side by rods 45 which are bolted to the stationary spring and to the sides of the bow by suitable nuts 35 and 37 and brackets 48. The machine is provided with a guard 49 which is attached to the lower part of frame piece 1 and extends in a curve upward and above the outer ends of the bars 35, as shown in Fig. 8, and is attached to the bars 35 by means of bolts 50. The guard 39 is bifurcated at the upper end for the passage of the feeder 19. The curved dotted line 51, in Fig. 8, indicates the path of the teeth of the feeder. 52 and 53 indicate straps of different thicknesses which may be treated by the machine, and the drawing shows the points at which the straps are to be fed to the machine. A movable clip or shield 54 is mounted on the guard above the bend in the guard and stands normally in the position shown in Fig. 8, and is held in this position by a spiral spring 55, which may be attached to the lower part of the guard 49 and to the end of the shield 54. A dog 56 is pivoted to the shield 54. The feeder 19 engages the dog 56 by means of the shoulder 57, and the dog 56 moves in the passage between the blocks 58 and carries the shield 54 therewith until the dog swings back on the left hand side of guard 49, by reason of the notch 59 in the side of dog 56, and remains there until the feeder passes by. When the dog 56 is released by the feeder 19, the spiral spring 55 draws the shield 54 back to its normal position. The shield 54 goes through this operation as often as a feeder 19 passes through the shield. The object of this shield is to prevent another strap from being fed to the machine after the front of the feeder has passed the receiving point, or spring 44. When the shield is carried to the strap starting by the feeder, the shield covers all the teeth of the feeder except the forward teeth, consequently the extreme forward end of the strap must engage the forward teeth of the feeder and in this manner all the teeth of the feeder are made to engage the strap and it is impossible for the strap to be engaged by the rearward teeth only of the feeder. The straps are secured on the teeth of the feeder by means of springs 38 to 42 inclusive. If the front teeth of the feeder engage the strap, then the springs will press the strap on all the teeth of the feeder. The spring 44 starts the strap on the teeth of the feeder and holds the strap down while the springs 38 and 39 press the strap firmly on the teeth of the feeder. If it were not for the springs 40, 41, and 42, the strap would tilt upward just as the feeder passes from under springs 38 and 39, and thus become loose on the feeder. The springs 40 and 42 become weaker in progression up to 42, so that the pressure is relieved from the strap gradually. Guide arms 132 are attached to the frame of the machine and serve to center the strap on the feeder. By means of these arms, together

with the spring 44, the strap may be properly started into the machine. In this manner the straps are fed to the machine.

The first operation on the strap after it is fed to the machine, is the trimming. The trimmer is indicated generally by the reference character A. The trimmer is composed of two similar sets of parts,—a right side and a left side. Each side carries two blades,—one blade for trimming the upper part of the edge of the strap and the other for trimming the lower part of the edge of the strap. The main frame 60 of the trimmer is bolted to the movable machine frame 5. Each blade is provided with a blade carrier and a blade carrier frame. The blade carrier frame 61 is a part of or integral with the main frame 60. The carrier 62 for the blade 63 for trimming the lower edge of the strap is mounted on the frame 61 and is stationary and held rigidly in place by the screw 64. The blade 63 is attached to the blade carrier 62 by suitable screws 65. The blade carrier 62 is made adjustable by means of the screw 66 and the screws 67, all carried by this blade carrier. The screw 66 may be screwed more or less out of the blade carrier to abut against the shoulder 68 of the blade carrier frame 61, and the screws 67 may be screwed more or less into the blade carrier so that the carrier will be raised more or less from the seat in the frame 61 when placed therein. The seat for the blade carrier 62 inclines inward, so that the carrier will tend to press inward instead of outward and the upper surface of the carrier inclines outward so that the screw 64 will tend to press the carrier inward solidly against the frame. To trim work of different thicknesses it is best to use different sets of blades having different curves, and in changing a great saving of time and annoyance is accomplished by my having the adjustable means attached to and removable with blades as, when once adjusted, said blades may be removed, and when replaced there is no trouble in setting them properly, as the adjusting screws rest against fixed parts of the frame.

The blade 69 for trimming the upper edge of the strap is mounted and operated by mechanism similar to the blade mechanism just described. The blade 69 is mounted in a carrier 70, which is mounted in a frame 71, which is movable relative to the frame 60. The blade carrier 70 is held in the frame 71 by means of a screw 72. The carrier 70 is adjustable in the frame 71 by reason of the screw 73, which may be screwed more or less out of the carrier 70 to abut against the shoulder 74 of the frame 71, and by the screws 75 carried by the carrier 70 which may be screwed more or less out of the carrier to raise the carrier more or less above the seat 76 of the carrier in the frame 71. The frame 71 has a vertically yielding motion upward and is held in its normal position by the spiral spring 77. The frame 71 carries two guide rods 78 and 79. The rod 79 is secured in the frame 71 by means of the set screw 80 and the rod 78 is held in place in the same frame by means of set screw 81. The capability of vertically yielding motion of the frame 71 can be seen from Figs. 12 and 17. The object of this yielding motion is to allow the blade for trimming the upper edge of the strap to adjust itself so that straps of different thicknesses may be trimmed by these blades. Straps enter the trimmer at 82, and thicker straps will come in contact with the beveled surface of the frame 71 and raise this frame more or less as the strap is advanced, the spiral spring 77 permitting the frame 71 to rise as the strap passes upward on the surface 83. It will be noticed that the seat 76 in the frame 71 for the carrier 70 is inclined upward and that the upper surface of the carrier is inclined outward. The object of this construction is so that the carrier will be forced inward in a manner similar to the operation of the carrier 62, above described. The blade 69 may be attached to the carrier 70 by screws 84. The guide rods 78 and 79 have passage ways through the main frame 60. The trimmers for the left side of the straps are similar to the trimmers above described.

Means are provided for blacking the edges of the straps after they leave the trimmer. The blacking mechanism is indicated by B. A trough 85 is provided for taking blacking from supply tube 91 and feeding through holes 86 in the side of the trough. The blacking runs through suitable openings 86 on bristles 87 or other means for spreading the blacking on the straps. The trough 85 is provided with a top 88 which is held on the bolts 89 by suitable nuts. The bolts 89 are screw bolts and hold the brushes 87 in place. The blacking mechanism is provided with an overflow trough or receptacle 90 for the excess of the blacking not used by the brushes 87 on the straps. The blacking is pumped through the pipe 91 into the trough 85 by means of any suitable pump. The excess of blacking is drawn off by a pipe 92. The brushes 87 are disposed in the path of the straps and spread the blacking on the straps as the straps are passing. It is necessary to fix the blacking on the straps at once, or it would be rubbed off in the succeeding operations. For this purpose a heater 93 is arranged parallel to the path of the straps and may be made integral with the frame 94 of the blacking mechanism, or otherwise attached thereto. A gas jet 95 is arranged adjacent to the opening into the heater 93 and attached to the frame 94. This burner operates as an ordinary gas burner. The side of the heater 93 is perforated next to the path for the passage of the straps whereby the strap is heated by jets of flame coming

from the perforations of the heater, and the blacking dried in as the straps leave the blacking mechanism. Any suitable heating mechanism may be used without departing from my invention. The blacking mechanism thus described is the mechanism for blacking the right edge of the strap. The left edge of the strap is blacked by similar mechanism arranged on the left side of the movable frame.

The flesh side of the strap is next blacked. Mechanism is provided for this purpose. This blacking mechanism is indicated by C. Before the straps are blacked on the flesh side, the straps must be treated by a preparatory solution. This is necessary because the grease "stuffing", or filling would not allow the blacking to become fixed on the strap. After the straps are treated with this preparatory solution they will readily take the blacking. For these purposes a trough 96 is prepared for containing this preparatory solution. The trough 96 is provided with suitable bristles 97, or other material, for spreading on this preparatory liquid. Some bristles 98 are arranged just outside of the trough to take off the surplus liquid which may cling to the straps, as the straps are leaving the brush 97. As the straps leave the brush 98 they are ready for receiving the blacking. The ink or blacking is contained in another trough 99, and bristles 100 spread the blacking on the strap as the straps are passing over the bristles or brushes, or other suitable material. Bristles 101 are prepared for brushing off surplus blacking from the straps. The troughs 96 and 99 are mounted in an overflow trough 102, and supported therein by suitable legs 103. A pipe 104 supplies the preparatory liquid for the trough 96. A pipe 105 draws off the overflow of preparatory liquid. The trough 102 has a partition therein to separate ink from the other liquid. The trough 99 is supplied with blacking, which may be pumped in through a pipe 107, and the overflow blacking is carried away by a pipe 108. The blacking overflows from the trough 99 into the trough 102. The under sides of the straps simply rub against the bristles 97 and 100. As the straps leave the blacking they are heated by the heaters 109 and 110 to drive the blacking in or fix it. The heaters 109 and 110 are perforated, as shown in Fig. 23.

Burner jets 111 are arranged at the mouth of the heaters 109 and 110 which operate as ordinary burners. The burner jets 111 are supplied with gas by any suitable pipe. As the straps pass over the heaters 109 and 110, the blacking is dried in or fixed in the straps. The object in having two heaters 109 and 110 is to adjust the machine to straps of different widths. When narrow straps are being blacked, only the heater 109 is used, and, of course, with the corresponding burner on the left of the machine. When wider straps are to be blacked, both the heaters 109 and 110 are to be used. This blacking mechanism is provided with supports 112 which are bolted to the stationary frame 3. The duplicate blacking mechanism for the left side is attached to the frame piece 4, it not being necessary to change the position of this blacking mechanism to black any width of strap. The blacking mechanism is provided with a cover 113, which is pressed down on the upper part of the straps while the lower part of the strap is being rubbed on the bristles 97 and 100. The cover 113 is pressed down on the straps by springs 114 and 115, which are wound on the shafts 116 and have the ends pressing on the cover 113. The shafts 116 are mounted in bearings 118 and swinging arms 117, which are pivotally attached to the cover 113 and engage the shafts 116. Thus the cover is held against displacement by the swinging arms 117, and held down on the straps by the springs 114 and 115. The cover shown in Fig. 26 is drawn on a smaller scale and is intended to be the cover for the blacking mechanism on both sides of the machine. When it is desired to pass a strap through the machine without blacking the underside of the strap, a thin piece of sheet metal 119 may be placed on the bristles 97 and 100, and the straps passed between the sheet metal cover 119 and the spring pressed cover 113. The sheet metal strip 119 has flanges which rest against the ends of the trough 96 so that they are not drawn out of place. The cover 113 will yield to allow any size strap to pass thereunder next to the bristles.

A wiper 101′ is attached to the cover 113 to remove surplus blacking that may accumulate on the upper side of the strap as it passes under the cover. This wiper is made of rubber or other suitable material. Wipers 102′ are attached to the brush body 99 to take the surplus blacking from the under side of the strap, and also to clean the feeders 19.

As the straps leave the flesh side blacking mechanism, the straps pass through a smoothing device D which smooths both bottom and top of the straps. The smoothing device contains a vertically yielding plate 120, which is set at an angle so that straps of different thicknesses may be received between this vertically yielding plate 120 and the base plates 121. The base plates 121 are integral with the frame 122. The plate 120 is rigidly attached to sleeves 123 which are mounted on the vertical guides 124. Spiral springs 125 hold the plate 120 normally in the position shown in Figs. 28 and 29, but allow this plate to yield upward to accommodate straps of different thicknesses, as the straps are drawn

along by the feeder 19. The base plate of this device has a slot 129 longitudinally therethrough for the passage of the feeder 19. Means are provided for regulating the tension of the springs 125. The bearings 126 are interiorly threaded, and subsidiary bearings 127 are exteriorly threaded and screwed into bearings 126, and may be screwed down therethrough to any extent desirable to exert pressure on the plate 120. A spring-pressed plate 128 intercepts the slot 129 to prevent a mark from being made in the central part of the strap caused by reason of the slot 129. As the feeder 19 strikes the plate 128, this plate will yield and allow the feeder to pass. As soon as the feeder passes the plate closes the slot 129, as shown in Fig. 27. A slot or groove is made in the base plate 121 for the plate 128. A spring 130 is coiled about a bearing 131 with one end pressing against the plate 128 and the other end pressing against the base plate 121. This smoothing device is attached to the stationary frame composed of parts 3 and 4, as the smoothing device needs no lateral adjustment. The outer front edge of the plates 121 have downward projecting flanges 132. Wipers 133 of some flexible material to clean the feeders 19 are attached to the flanges by means of screws 134.

After the strap has been passed through the smoothing devices, the edges of the strap are treated with the filler. The filler is applied to the edge of the strap by means of the devices E. The right side filler receptacle 135 is provided with a flange 136 for mounting the filling device, on the movable frame piece 5, the left side filling device being similarly fastened to frame 6. The filler is fed to the edge of the strap by means of the wheel 137, made of rubber or some other resilient material. The filler receptacle 135 has an opening 138 in the lower part thereof adjacent to the wheel 137. The filler wheel 137 is provided with a shaft 139 which is journaled in a bearing 140 formed on a flange 141. The shaft 139 is provided with a nut 142 on the upper part thereof, and this nut presses on a flat disk 143. This disk 143 and a similar disk 144, on which the wheel 137 may rest, are used to expand the wheel 137 by clamping the wheel between the two disks. The shaft 139 is held against displacement upwardly by means of a spring 144′, which is attached to the filler receptacle 135. The wheel 137 is driven by means of friction against the passing strap. A small brush 145 is mounted adjacent to the filler receptacle 135 between the lug 146 and the filler receptacle by means of a screw 147. This brush distributes the filler material evenly on the periphery of the wheel 137. Another brush 148 brushes the edges of the strap as the strap leaves the filler wheel 137 to take off the surplus filler material and even it on the strap. This brush is mounted between lugs 149, which are formed integral with the receptacle 135 and held in place by the screw 150. The Figs. 30 and 31 show a weight 151 for pressing the filler down. This weight presses on the filler and causes the same to feed through hole 138 to the wheel 137, and constitutes a gravity feed for the filler. The weight may be adjusted to its place or removed by means of a handle 152.

In Figs. 32 and 33 I show a variation of the filler feeding device. A pinion 153 is mounted on the shaft 139. A screw shaft 154 is journaled in the bearing 155. A cog-wheel 156 is mounted on shaft 154 and meshes with pinion 153. A disk or weight 157 is moved up and down by means of the screw-shaft 154 by means of a split nut 158. The two parts of the split nut are provided with handles 159, which are pivoted in the bearings 160, which are formed integral with the disk 157. Normally the two parts form a nut and engage the screw-shaft 154. The object in having the nut split is that the nut may be caused to release the shaft 154 so that the disk 157 may be adjusted back near the top of the filler receptacle without running the machine backward to cause the disk to travel backward to the top of the filler receptacle. By taking hold of the handles 159 the nut may be caused to release the shaft 154, and the disk can then be raised to the top of the filler receptacle 135, when the handles 159 may be released so that the nut will again engage the shaft 154 for the purpose of feeding the disk downward as the screw-shaft 154 is driven by the gearing above described. In this manner the filler may also be fed for filling the edges of the straps. The screw-shaft 154 is driven by the cog-wheel 156. The cog-wheel 156 is driven by the pinion 153. The pinion 153 is driven by the shaft 139 and wheel 137.

After the edges of the strap have been filled, the strap is creased by the creasing device F. The right-side creasing mechanism is attached to the movable frame 5 by means of a projecting base flange 161, which is formed integral with the frame 162. A lower roller 163 is journaled on the frame 162, which is stationary. The creasing or finishing roller 164 is journaled on a spindle 180, which is mounted in the vertically movable bearing 170, which is carried by the movable frame-piece 165 and may be integral therewith. This movable frame 165 is pivoted to the frame 162 by means of a pivot pin 166, which pin has a bearing 167′ formed on the frame 162 at the front end thereof. The creasing roller 164 has a yielding motion upward, and this yielding motion upward is regulated by a flat spring 167, which has a bearing 168 on the front end of the frame 162. The other end of the spring 167 rests

on a bolt or screw head 169, mounted in a bearing 170 of the creasing roller 164. The bearing 170 is simply the enlarged end of frame-piece 165. A screw 171 is threaded and passes through the flange 172, formed integral with the frame 162, for pressing on the spring 167. By means of the screw 171 the pressure of the creasing roller on the strap may be adjusted. The strap enters between the inclined plate 165′ formed on frame piece 165, and the horizontal plate 162′ formed on frame-piece 162, the inclined plate permitting the entry of straps of different thicknesses. The straps open the roller by means of the plate 162′ and the plate 165′, which latter plate yields upward and these plates will be called roll openers. I have provided a simple and expedient manner of adjusting the creasing rollers. The creasing rollers are to be varied to suit the particular design or finish for different straps. The creasing rollers are held even with the bottom roller by a circular flange 173 which engages a circular groove 174 in the roller 163. The roller 163 is journaled on the spindle 175, and is held on said spindle by means of the spring 176. This spring is attached to the frame 162 by means of screws 177. The inner end of this spring is bent to form a hook 178. This hook forms an acute angle with the spring 176. This hook 178 engages a circular groove 179 in the roller 163. The creasing roller 164 is journaled on a spindle 180. This roller is first adjusted to the roller 163 with the flange 173 resting in the groove 174. The two rollers are then shoved on their respective spindles, and the spring 176 is sprung outward until the rollers are adjusted on the spindles, and then the hook 178 engages the roller 163 by projecting in a groove 169. No other means are necessary to hold these rollers in place. The left side creasing mechanism is similar in all respects to the right side creasing mechanism.

After the edges have been creased, the edges of the straps are then rubbed. I have provided a means for rubbing the edges of the straps, which means has an effect similar to rubbing with the hands. The right frame 181 is bolted to the movable frame piece 5. The upright portion 182 of this frame is somewhat corrugated, as shown at 183. A block of rubber 184, or other resilient material, is attached to the frame piece 182 by means of the cloth 186. The spring 185 assists in guiding the strap on the rubber 184. The strip of cloth 186 may be attached to the frame piece 182 by means of teeth 187. This cloth extends the entire length of the rubber 184 so that a strap rubs against the strip of cloth instead of against the rubber, or resilient material, 184. The strap is principally guided by the groove in the rubber. The springs 185 are attached to the frame piece 182 by means of screws 188. The rubbing devices for the left side are similar in all respects to those of the right side, and are attached to the movable frame 6.

The next operation of treating the straps consists in devices for smoothing the edges of the straps in order to give a compact finish to the edges of the strap. These right side devices for smoothing or evening the edges of the strap consist of a frame 189 pivotally mounted in a bracket 190, which is rigidly mounted on frame piece 5. The means for mounting the frame piece 189 on the bracket 190 consists of the arms 191, the pivot bolt 192, and the lugs 193 on the bracket 190. Means are provided for limiting or regulating the downward motion or position of the frame 189. A lip 194 projects from the bracket 190 under a lip 195, which lip 195 is integral with frame 189. A screw-bolt 196 operates through the lip 195 to elevate this lip more or less above the lip 194. The object of this is to permit the adjustment of the polishing or smoothing device to different thicknesses of straps. A yielding motion upward is permitted by this construction; the upward yielding motion can also be limited or regulated. An arm 197 is mounted on the shaft 8 by means of a set screw 198—a groove 199 being formed in the shaft 8 for this set screw. The smoothing device now being described for operating on the right edge of the strap, has an arm 200 attached thereto by screws 201. This arm projects loosely through an eye 202 formed in the arm 197. The device for operating on the left edge of the strap has a similar arm 203, also passing through the eye 202. The object of these arms is to cause the frames 189 for the right and left edges of the strap to move together upward and downward. Spring smoothing devices are attached to the frame 189. The springs *a*, *b*, *c*, *d*, *e*, *f*, and *g* are clearly shown in Figs. 39, 40, and 41 with their attaching screws. As seen from Fig. 41, these springs project in the path of the strap *h*. It will be noticed that each spring is adapted to press on the strap from a different direction, the spring *g* pressing squarely on the edge of the strap. The strap *h* is forced past the springs by means of the feeder 19.

After the edges of the strap have been made smooth, the edges are again rubbed by the resilient rubbing devices J, which are similar in all respects to the rubbing devices already described, consequently another description is not necessary. After this rubbing of the edges of the strap again, the strap is finally cleaned before being thrown out of the machine. The final cleaning device K is provided with frame pieces 204 which are bolted to the stationary frame pieces 3 and 4 of the main frame, it not being necessary that the right and left parts of this cleaning device should have lateral adjustments, the

upper and lower sides of the straps being rubbed by the brushes 205 and 206. The brushes 205 are attached to a carrier 207 by screws 208; and the brushes 206 are attached to lips 209, projecting from the frame-piece 204, by screws 210. The brushes 206 may be made in two parts each, the division being indicated by a dotted line 211. The advantage of this is that the central parts of brushes wear out sooner than the outside parts of the brushes. The same is true of the brushes 205. The space between the two lips 209 is for the passage of the feeder 19. It will be noticed that the inner edges of these lips are made slightly flared by rounding the same so that the feeder will be readily and certainly received although these lips may be slightly out of line of the feeder. Shafts 212 are mounted in the frame pieces 204. Spiral springs 213 are coiled about the shafts 212. On each side of the device these springs have their ends caught about the frame pieces 204. The other ends of the wires engage eyes 214 which are formed on the brush carrier 207. The brush carrier is held down by the springs 213. The upper brush will thus yield upward to adapt this cleaning device to straps of different thicknesses.

After the strap is finally cleaned it is carried back to the front of the machine by the feeder 19 which is carried by the belt or double sprocket chain composed of the chains 16 and 17 connected together by the bars 18 to a point near the front end of the machine whence the feeder passes through a releasing device 215 which consists of a plate which has a slot formed therein to receive the feeder 19. This strap release is bolted to the guard 49 and to the frame of the machine and set at an angle so that the teeth of the feeder will be drawn through this slot and leave the strap on the underside of the release, the strap being stripped off by the release.

The machine is driven by any suitable power. The power is applied to the shaft 27 for the purpose of driving the belt or chain carrying the feeders 19. A cog-wheel 216 is mounted on the shaft 27. A pinion 217 is mounted on shaft 218 which shaft is journaled in the bearings 219. A friction drive wheel 220 is also mounted on the shaft 218. A cam 221 which coöperates with the cam 222 on the bearing 219 is mounted on shaft 218. An arm 223 is formed integral with the hub of cam 221. An arm 224 is also formed integral with the hub of cam 221. A spiral spring 225 is connected to the arm 224 and to the frame 2. A pull on the arm 223 will throw the wheel 220 in mesh with the friction cone 226. The shaft 218 may be driven by any suitable power. For convenience in throwing the wheel 220 in mesh, a rod 227 is connected to the arm 223 and to the bell-crank lever 228, which serves as a pedal, the bell-crank lever being mounted at the front of the machine.

An automatic cut-off is provided for cutting down the supply of gas which is fed to the heaters on the machine. This is done to save fuel while the machine is not in operation. An arm 229 is attached to the cock 230, and a rod 231 is pivotally connected to the rod 227 and pivotally connected to the arm 229, the cock 230 being mounted on and adapted to intercept the passage through the gas-pipe 232. A pressure on the lever 228 will start the machine to work and at the same time open the cock 230. When the lever 228 is released the cock 230 will be partly closed, and the machine will stop.

Tanks 233 and 234 for holding the blacking and the preparatory or sizing solution are mounted at the front of the machine, and the supply and overflow pipes above described are connected with these tanks. Any suitable pumps may be placed in said tanks and used to force the blacking through the supply pipes above described. The pumps may be operated by the connecting rod 236 which is attached to crank 237.

The operation of the various parts making up this machine are above described in detail, and only a brief general description of the operation will now be made. The operator may stand with one foot on the lever 228 and present the straps to the machine. The devices at the front of the machine will receive the straps, only one at a time, and fasten the same on the first one of the feeders 19 that is brought along by the sprocket chain belt. The feeders 19 are distributed at suitable distances along the sprocket chain. The feeders carry the straps through the machine in contact with or presenting the same to each operating element, and then back under the machine to a point near the front of the machine, and the straps are taken from the machine by the releasing device heretofore described. The most of the elements for operating on the straps are arranged in pairs and mounted on frame pieces which are laterally adjustable. All of the adjustable elements are adjustable simultaneously, and may be adjusted to operate on straps of any ordinary width. It will be noticed that where straps are of different thicknesses, the elements for operating on the same are automatically adjustable vertically. It will be seen that all of the elements above described for operating on straps are disposed in the positions to operate on the straps as the straps are passing. The frame-pieces are perfectly adjustable to any ordinary sized strap. A graduated bar, 235, is attached to the bear-

ings of one of the screw shafts for adjusting the frames. With such bar the frames can be set at the proper distance apart.

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

1. A leather working machine having a feeder for engaging the work, means for pressing the work on said feeder, and means for holding the work on said feeder while passing from under said pressing means.

2. A leather-working machine provided with a suitable frame, a frame in two parts adjustable toward and from each other and carrying various elements arranged in pairs for finishing the edges of straps, elements for finishing the top and bottom sides of straps mounted on said first mentioned frame, a double sprocket chain running between said adjustable frame parts and carrying at intervals feeders projecting between said finishing elements, each feeder being provided with a row of teeth, and springs located at the front of said machine for pressing straps on said teeth.

3. A leather working machine having a stationary frame, a frame consisting of two laterally adjustable parts suspended on said stationary frame, elements for finishing the edges of straps arranged in pairs, each adjustable frame part carrying one element of each of said pairs of elements, pairs of elements for finishing the bottom and top sides of straps, means for drawing straps through said finishing elements consisting of a feeder running between said frame parts and provided with teeth running between said finishing elements, a shield for the rear teeth of the feeder, and springs for pressing straps on said teeth.

4. In a machine for operating on straps, a toothed feeder, means for pressing work on the teeth of said feeder, and springs rearward of said pressing means for holding work on said feeder as the work passes from said pressing means.

5. A leather-working machine having a frame, devices for finishing the flesh and grain sides of straps mounted on said frame, a frame in two parts adjustable toward and from each other suspended on said first named frame, edge finishing devices in pairs carried by said adjustable frame, feeding devices passing between the elements composing each pair of finishing devices, means for fixing straps on said feeding devices, and a movable shield coöperating with said fixing devices.

6. A leather-working machine having various elements for finishing straps arranged in pairs, each pair consisting of right and left operating elements, and means for feeding straps to said finishing elements consisting of a double sprocket chain carrying feeders, guides mounted on the front of the machine, a series of springs acting on each strap to fix the same on said feeders, and a movable guide clip coöperating with said springs.

7. A leather-working machine having various strap finishing devices and means for feeding straps to said devices consisting of suitable guides mounted on the front of the machine, a sprocket chain carrying strap feeding devices, means for fixing the straps on said feeding devices, and a clip or shield actuated by the feeding devices.

8. A leather-working machine for finishing straps and traces, having starting and feeding devices consisting of a double sprocket chain, means for driving said chain, feeders carried by said chain, guides for directing straps into said machine, springs for pressing and fixing the straps on said feeders, and a movable guide clip coöperating with said springs.

9. In a machine for operating on straps, a double sprocket chain carrying feeders, each feeder having a row of teeth for engaging one of the flat faces of a strap and standing normally in the path of the strap and means for turning each feeder out of the path of the strap and holding the same substantially in the plane of the sprocket chain when not in use.

10. A machine for operating on straps, a feeder having a row of teeth, and means for preventing the extreme end of straps from being engaged by the rearward teeth of said feeder.

11. In a machine for operating on straps, feeders provided with teeth for engaging straps, a shield for covering the rearward part of said feeders while the feeders are passing the strap starting point, whereby a strap placed at starting point after the front of the feeder has passed will not be engaged until next feeder arrives.

12. A machine for operating on straps having one or more teeth for driving the straps through the machine, a yielding bar for pressing the straps onto said teeth, and means for holding said bar under tension just out of contact with said teeth.

13. A machine for operating on straps and traces having a chain belt carrying a feeder, said feeder mounted on a frame, the forward and rearward portions of said frame being attached to said belt, and the said frame, whereby said feeder is forcibly held upright when passing a strap or trace through said machine.

14. In a leather-working machine the combination of a chain-belt feeder carrier and feeders, and means for holding said feeders in upright positions on said carrier while passing straps or traces through the machine.

15. A leather working machine adapted to receive and operate on straps of different sizes having a main frame, right and left vertically adjustable frames mounted thereon,

blade carriers removably mounted on said adjustable frames, blades permanently fixed on said carriers, means for adjusting said carriers carried by said carriers, and means for attaching said carriers to said adjustable frames.

16. A leather working machine adapted to receive and operate on straps of different sizes having a main frame, right and left vertically adjustable frames mounted thereon, blade carrier frames mounted on said adjustable frames and provided with seats for blade carriers, blade carriers mounted in said seats and carrying means for adjusting the same in said seats, and blades fixed on said carriers.

17. A leather working machine having right and left edge trimming devices consisting of blades for trimming the upper and lower edges of straps, blade carriers, frames vertically adjustable and provided with inclined seats for said carriers, and screws carried by said carriers for adjusting the carriers in said seats, said blades being fixed on said carriers.

18. A leather working machine having right and left edge trimming devices consisting of blade carriers, blades fixed on said carriers, frames provided with seats for said carriers, means carried by said carriers for adjusting the carriers in said seats, and screws engaging inclined surfaces of said carriers to hold same in place.

19. In a machine for trimming straps or traces having blade carriers, blades fixed on said carriers, seats for said carriers, and adjusting means carried by said carriers determining the position of said carriers in said seats.

20. A leather-working machine having right and left edge blacking devices laterally adjustable consisting of troughs for containing blacking, frames for supporting said troughs attached to the machine frame, and brushes for applying the blacking to the straps disposed in the path of the straps, and means for supplying said troughs with blacking, said troughs being constructed to allow the blacking to overflow and run on said brushes.

21. In a leather working machine, a feeding belt carrying plates projecting therefrom at intervals, each plate being provided with teeth, and strap detaching means on each side of the path of said plates and operating between said teeth and said belt.

22. A leather-working machine having brushes arranged to black the bottoms of straps, a narrow passage being formed through said brushes, a strap feeder, means for passing said feeder through said passage and draw straps over said brushes and means for pressing straps against said brushes.

23. A leather working machine having a toothed feeder plate for drawing the work through the machine and a stripper coöperating with said feeder whereby straps are detached from said teeth, said stripper consisting of an inclined plate having a slot therein for the passage of said teeth.

24. A leather working machine having a frame, said frame having a seat for a blade carrier, a supporting lip inclined toward said seat, a carrier retaining screw adjacent to said seat, a carrier having a surface inclined toward said seat when in place, and adjusting screws projecting from the carrier and resting on said supporting lip, said inclined supporting lip coöperating with said retaining screw and said inclined surface of said carrier to hold said carrier against said frame, the position of the blade being controlled by the amount of projection of said adjusting screw.

25. A leather working machine for applying blacking to the flesh side of straps having a trough provided with suitable brushes and an upwardly yielding cover for pressing the passing straps against said brushes, said cover having the receiving end inclined at an angle to the path of the approaching strap.

26. A leather-working machine having means for applying blacking to the flesh side of the strap, having a trough provided with suitable brushes, brushes for removing surplus blacking from the straps as they leave the blacking trough, an upwardly yielding cover for pressing the passing straps against said brushes, and rubber wipers for cleaning the straps as the straps leave said blacking devices.

27. A leather-working machine having devices for smoothing straps passing through said machine, consisting of a base plate disposed under the path of the straps, an inclined plate above said base plate, a yielding frame carrying said inclined plate, and a suitable frame for mounting said devices and attaching the same to the frame of said machine.

28. A leather-working machine having a frame provided with base plates disposed under the path of straps passing through the machine, an inclined plate disposed above said base plates, guide-rods attached to said inclined plate, and means for holding said inclined plate yieldingly downward.

29. A leather-working machine provided with smoothing devices having a frame carrying base plates disposed below the path of passing straps to be in contact with the passing straps, a yielding frame having guide-rods, an inclined plate carried by said guide-rods, and a yielding slide plate for closing the passage between said base plates.

30. A leather-working machine provided with smoothing devices having a frame carrying base plates, an inclined plate disposed above the said base plates and attached to guide-rods passing up through said

frame, springs for pressing said plates toward each other, and means for regulating the tension of said spring.

31. A leather-working machine having devices for applying filler to the edges of passing straps consisting of wheels of resilient material to be rotated by the passing straps, filler receptacles having openings for feeding filler to the peripheries of said wheels, and means for forcing the filler through said openings consisting of a disk resting on the filler, a screw shaft operating through said disk and gearing actuated by said filler wheels for driving said screw-shafts.

32. A leather-working machine having devices for applying filler to the edges of passing straps consisting of filler receptacles having openings and projecting flanges below said openings, filler wheels mounted on said flanges adjacent to said openings, brushes mounted on said receptacles for spreading the filler uniformly on the peripheries of said wheels, and brushes mounted on said receptacles and adapted to contact with the edges of passing straps to apply the filler uniformly to the edges of said straps.

33. In a leather-working machine provided with creasing rolls, roll-openers coöperating with said rolls whereby said rolls are opened proportionately to the thickness of the approaching strap.

34. A leather working machine having a frame provided with an inclined surface, a carrier having an inclined surface, trimming blades mounted on said carrier, said carrier having screws projecting therefrom and resting on the inclined surface of said frame whereby its position in the machine is regulated for trimming the straps and a retaining screw resting on the inclined surface of said carrier, both of said inclined surfaces tending to press the carrier against its seat.

35. In a leather-working machine for operating on straps, the combination of a suitable grease or filler receptacle, a roller adapted to take the grease or filler from said receptacle and apply the same, and filler feeding apparatus arranged to force the filler from said receptacle with power derived from passing straps.

36. In a machine for operating on straps, the combination of a filler receptacle, a resilient wheel actuated by passing straps for applying filler to straps, and a feed for the filler having pressure exerting means whereby said filler is fed with uniform pressure.

37. In a leather-working machine, edge burnishing devices consisting of metal pressing surface held yieldingly against the edges of passing straps and perforated frames carrying said metal pressing surfaces and permitting the same to adjust themselves automatically to conform to the varying contour of the rounded edges of straps of different thicknesses and to the rounded edges of straps which have parts thereof thicker than other parts thereof.

38. A leather-working machine having right and left creasing devices laterally adjustable toward and from each other consisting of pressing wheels provided with suitable spindles, creasing wheels coöperating with said pressing wheels, yielding pivoted frames carrying said wheels and provided with flanges converging toward said wheels for the reception of straps of varying thickness, and means for varying the resistance to the yielding motion of said frames.

39. A leather-working machine having right and left creasing devices laterally adjustable toward and from each other consisting of pressing wheels, frames carrying spindles for said pressing wheels, creasing wheels adjacent to said pressing wheels, bearings for said creasing wheels, pivoted frames carrying said bearings, flanges carried by said frames above and below the path of the straps and converging toward said wheels, and springs pressing on said bearings and permitting vertical yielding motion of said creasing wheels.

40. A leather-working machine having creasing mechanism consisting of pressing wheels having peripheral grooves therein and provided with suitable spindles, creasing wheels provided with suitable spindles and yieldingly mounted adjacent to said pressing wheel and having flanges projecting in the peripheral grooves of said pressing wheel and provided with hooks engaging the peripheral grooves in said pressing wheels whereby said wheels may be adjusted and held in place.

41. A leather-working machine having creasing mechanism having pressing wheels provided with rigid frames attached to the machine frame, creasing wheels mounted adjacent to said pressing wheels and provided with yielding frames pivoted to said rigid frames and means adapting said mechanism to receive straps of different thicknesses consisting of horizontal plates projecting from said rigid frame, and inclined plates projecting from said pivoted frames.

42. In a machine for operating on straps, the combination of suitable creasing rolls or wheels and plates set at an angle with each other and adapted, when actuated by passing straps, to open said rolls to receive the straps.

43. In a leather-working machine, the combination of suitable creasing or finishing rolls, a yielding hook adapted to hold said rolls in place, a feeding device, and a suitable belt carrying said feeding device.

44. A leather-working machine for operating on straps having rubbing devices adapted to rub the edges of straps of different thicknesses consisting of right and left laterally adjustable bars of resilient material mounted

to contact with the edges of passing straps, and means for engaging the flesh side of straps away from the edges thereof and guiding the straps against said bars.

45. A leather-working machine having right and left edge rubbing devices laterally adjustable toward and from each other consisting of bars adjacent to the path of passing straps and corrugated transversely to said path, pads of resilient material attached to said bars, and means for guiding straps against said resilient material.

46. A leather-working machine having right and left edge rubbing devices laterally adjustable toward and from each other consisting of frame pieces attached to the machine frame and provided with upwardly projecting flanges corrugated transversely to the path of passing straps, bars of resilient material secured against the corrugated surfaces of said flanges, covering protecting said resilient material, and means for guiding straps against said covering.

47. A leather-working machine provided with right and left edge rubbing devices having frame pieces attached to the machine frame and provided with upwardly projecting flanges corrugated transversely to the path of passing straps, pads of resilient material secured against the corrugated surfaces of said flanges, and means for guiding straps against said resilient material.

48. A leather-working machine having right and left edge rubbing devices consisting of corrugated bars lying adjacent to the path of passing straps, pads of resilient material placed against the corrugated surfaces of said bars, covering of the character of cloth for said resilient material, and wires having bows projecting in front of said pads and having their ends extended and lying against said covering above and below the path of passing straps.

49. A leather working machine having right and left edge smoothing devices consisting of curved frames pivotally mounted on the machine frame, and springs attached to and projecting from various points on the curvatures of said frames against the edges of passing straps.

50. A leather-working machine having right and left edge smoothing devices consisting of yielding pivoted frames and springs attached to said frames and pressing concentrically on the edges of passing straps.

51. A leather-working machine of the character indicated having right and left edge smoothing devices consisting of curved frames pivotally mounted on the machine frames and pressing surfaces carried by said frames and bearing against the edges of passing straps.

52. A leather-working machine of the character indicated having right and left edge smoothing devices consisting of curved frames pivotally mounted and having a swinging motion transverse to the path of passing straps and a series of springs for pressing on each edge of a strap, said springs being attached to said frames at various points of the curvature thereof and having the ends of the springs converging toward the edges of the strap.

53. A leather-working machine having right and left smoothing devices, having frames pivotally mounted on the machine frames, metal pressing surfaces carried by said frames and adapted to press against the rounded edges of passing straps and means permitting upward yielding motion to said frames and limiting the downward movement of said frames.

54. A leather-working machine for finishing straps provided with edge smoothing devices having frames pivotally mounted on the machine frame, springs attached to said frames and provided with pressing surfaces, and means for regulating the upward and downward motion of said frame.

55. In a leather working machine, a stationary smoothing plate having a slot therethrough for a feeding device, a smoothing plate coöperating with said stationary plate and capable of yielding motion from said stationary plate, means for constantly pressing said yielding plate toward said stationary plate, and strap feeders passing through said slot and drawing straps between said plates.

56. A leather-working machine having a feeder belt provided with teeth grouped at intervals for engaging a strap at its forward end, and means for turning each group out of the path of passing straps when not in use.

57. In a leather-working machine, smoothing devices set at angle to each other and a strap feeder, one of said smoothing devices having a closed passage for said feeder capable of being opened by said feeder and closing automatically after the passage of said feeder.

58. In a leather-working machine, feeding devices consisting of a belt having transverse bars, a pivoted bar carried by said transverse bars, and a toothed plate carried by said pivoted bar.

59. In a leather-working machine, feeding devices consisting of a belt carrying transverse bars, a pivoted bar carried by said transverse bars, a toothed plate carried by said pivoted bar, and a spring for holding said plate yieldingly in or out of the path of a passing strap.

60. In a leather-working machine, a chain belt feeder carrier and a plurality of feeders pivotally attached thereto, said feeders being adapted to be turned down substantially to the plane of said carrier when not in use.

61. In a machine for operating on straps, the combination of suitable creasing rolls or

wheels and strap guiding and receiving plates gradually converging toward each other in the approach to said rolls and adapted, when actuated by passing straps, to open and receive the straps of various thicknesses.

62. A leather-working machine having feeding devices consisting of a belt carrying at intervals feeders and means carried by said belt for preventing backward tilting of said feeders.

63. In a leather working machine, a pair of edge blacking brushes, means for supplying blacking to said brushes, a feeder passing between said brushes, and a trough for each brush having a lip projecting under each brush.

64. In a leather working machine a smoothing device having upper and lower members provided with a passage therethrough for smoothing the sides of straps, and a feeder passing through said smoothing device.

In testimony whereof, I set my hand in the presence of two witnesses, this 11th day of May, 1904.

FRANK K. RUSSELL.

Witnesses:
A. L. JACKSON,
L. T. KNIGHT.