No. 876,562. PATENTED JAN. 14, 1908.

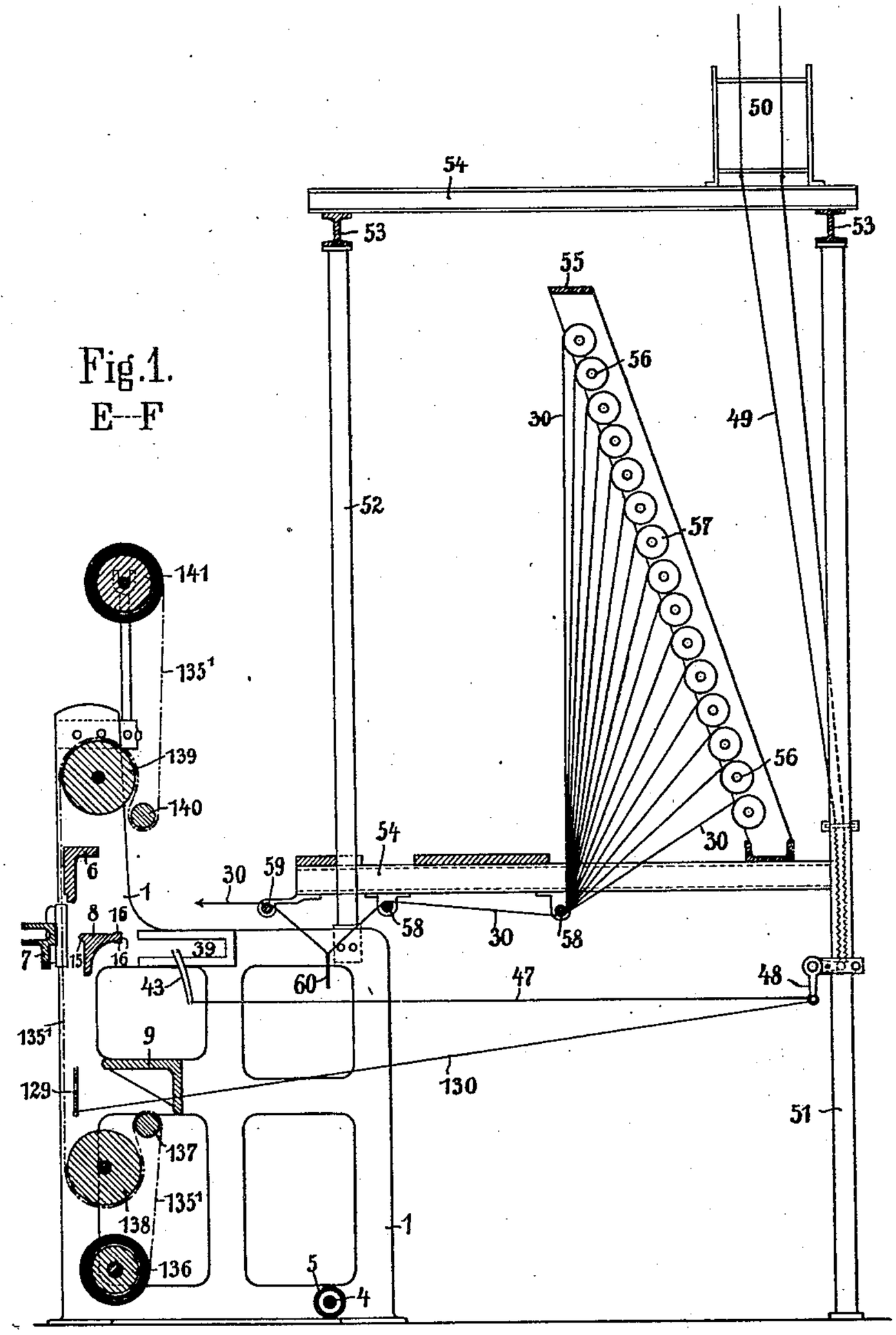
F. KLEUTGEN.

MACHINERY FOR EMBROIDERING A FABRIC WITH PILE THREADS IN PATTERNS.

APPLICATION FILED AUG. 19, 1905.

7 SHEETS—SHEET 1.

Fig. 1.
E—F



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7 SHEETS—SHEET 2.

Fig. 14.

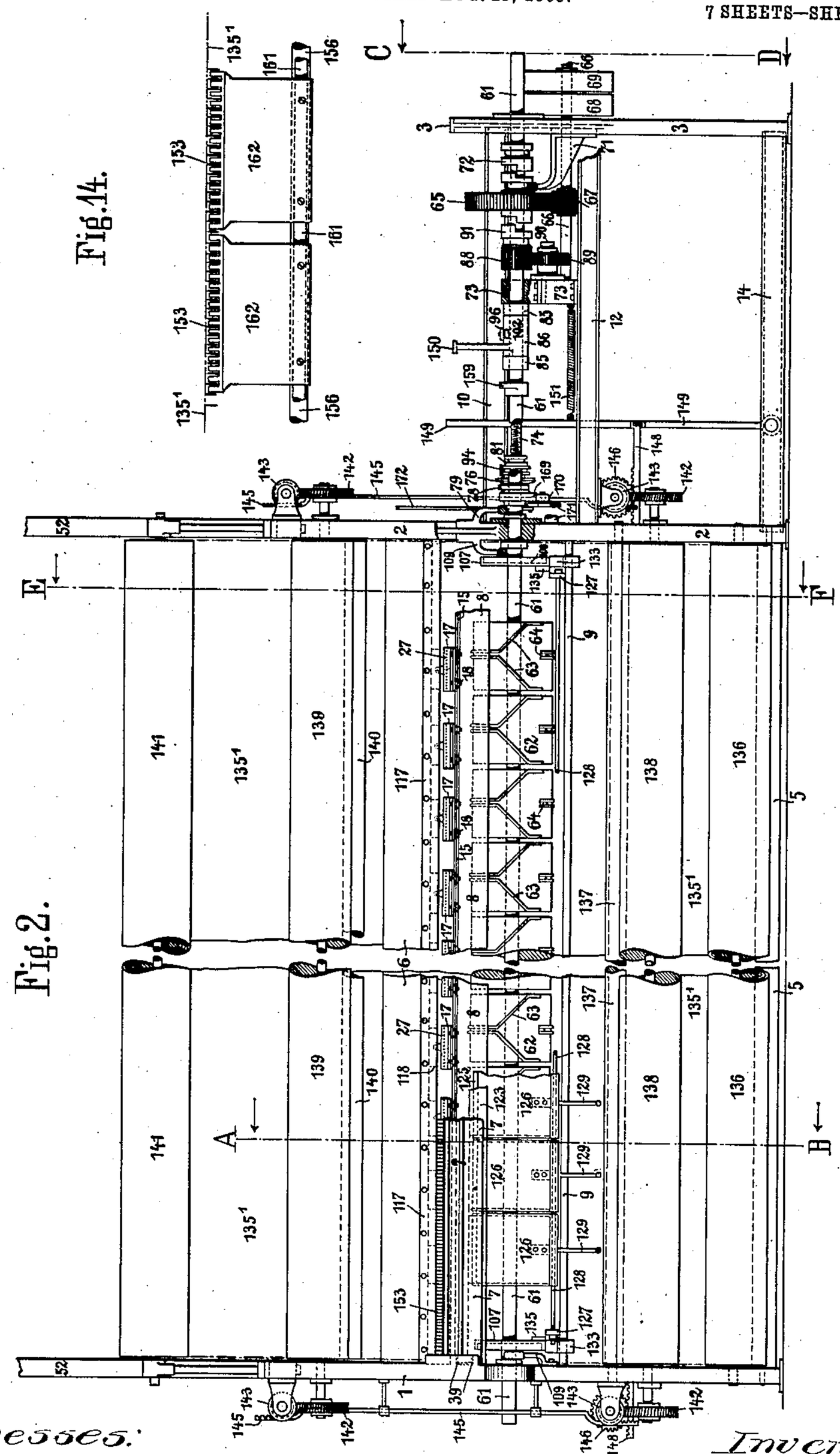

Fig. 2.

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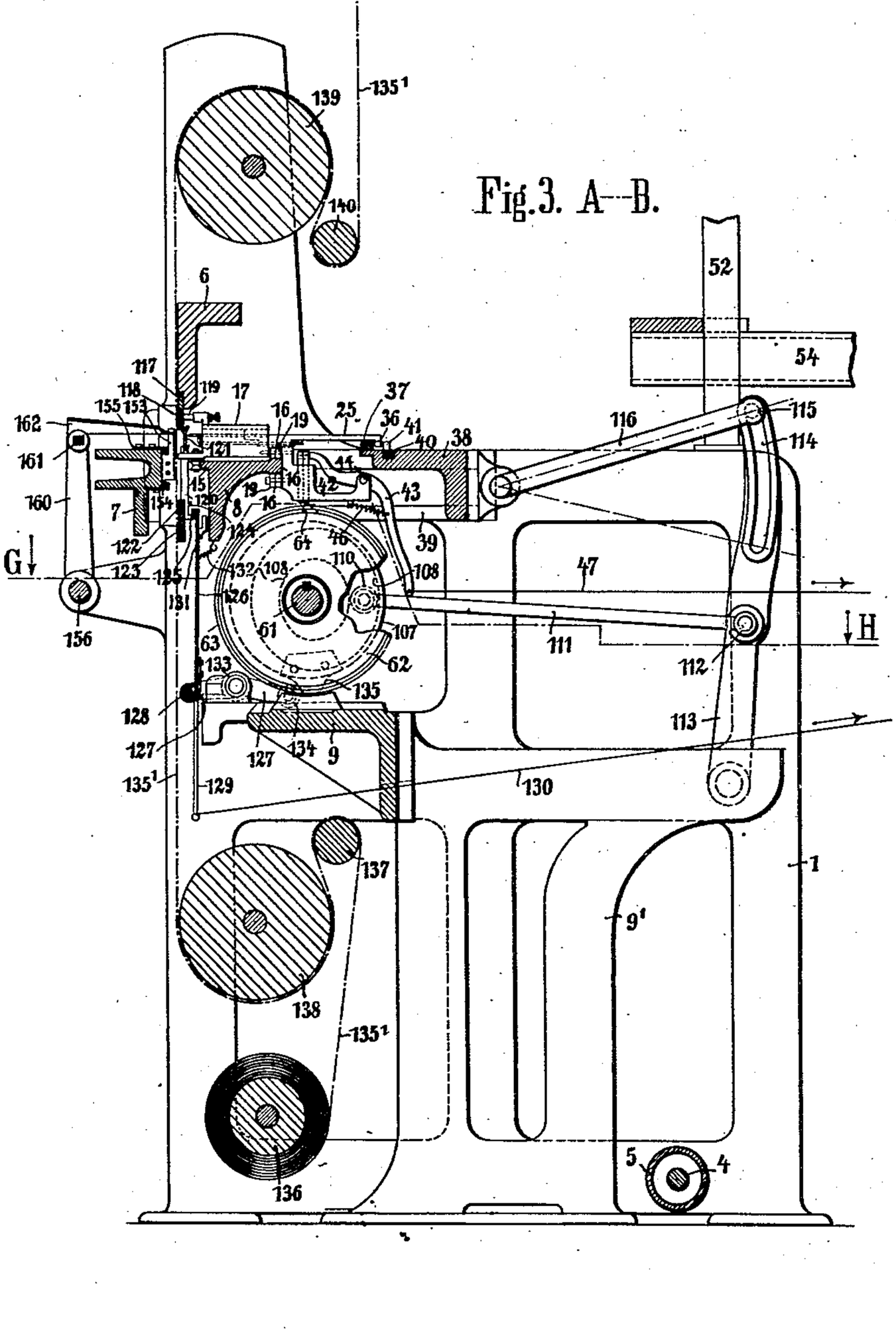
7 SHEETS—SHEET 3.

Fig. 3. A—B.



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7 SHEETS—SHEET 4.

Fig. 4ª

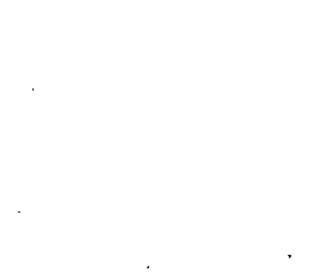
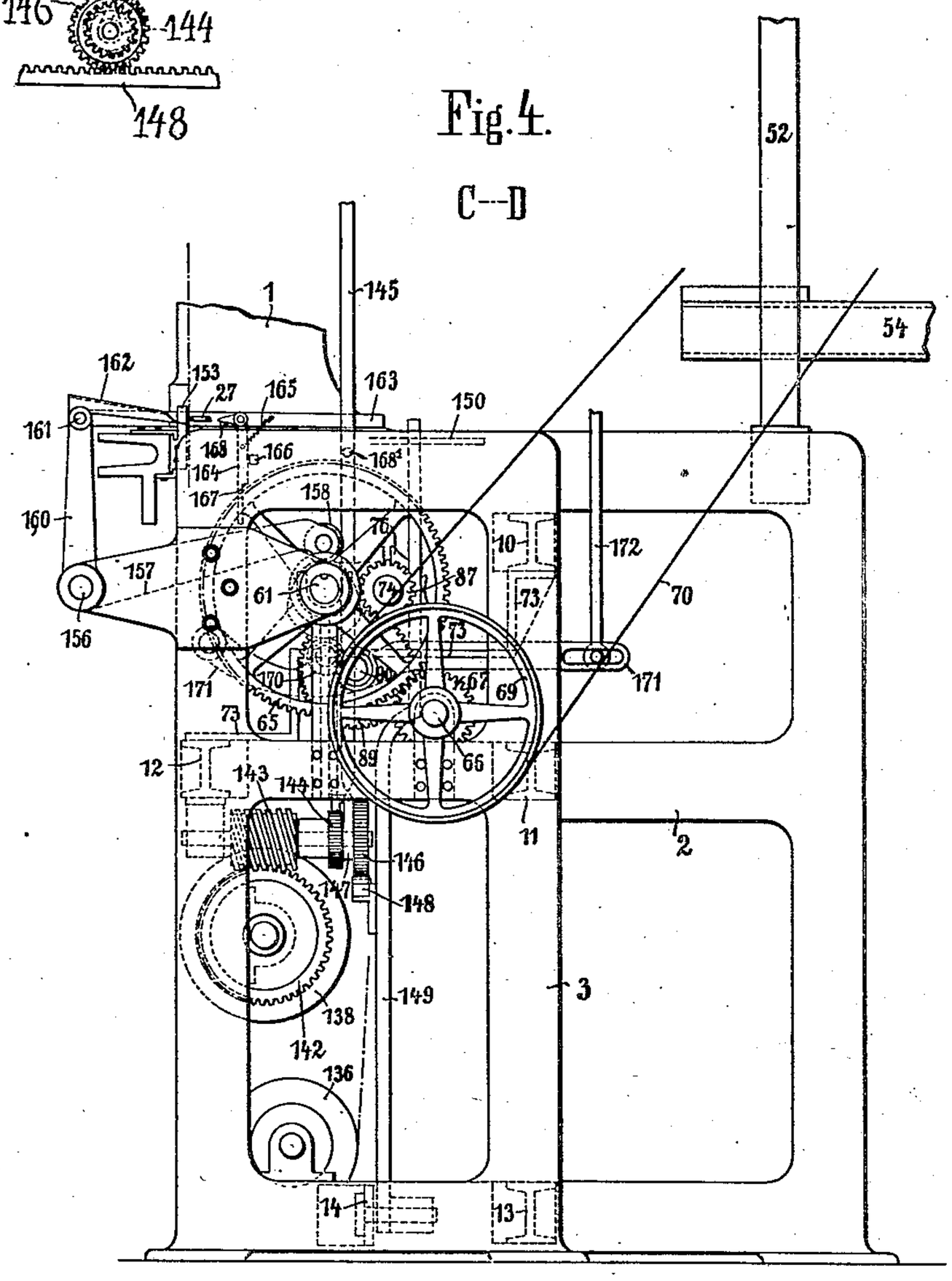


Fig. 4.

C—D



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7 SHEETS—SHEET 5.

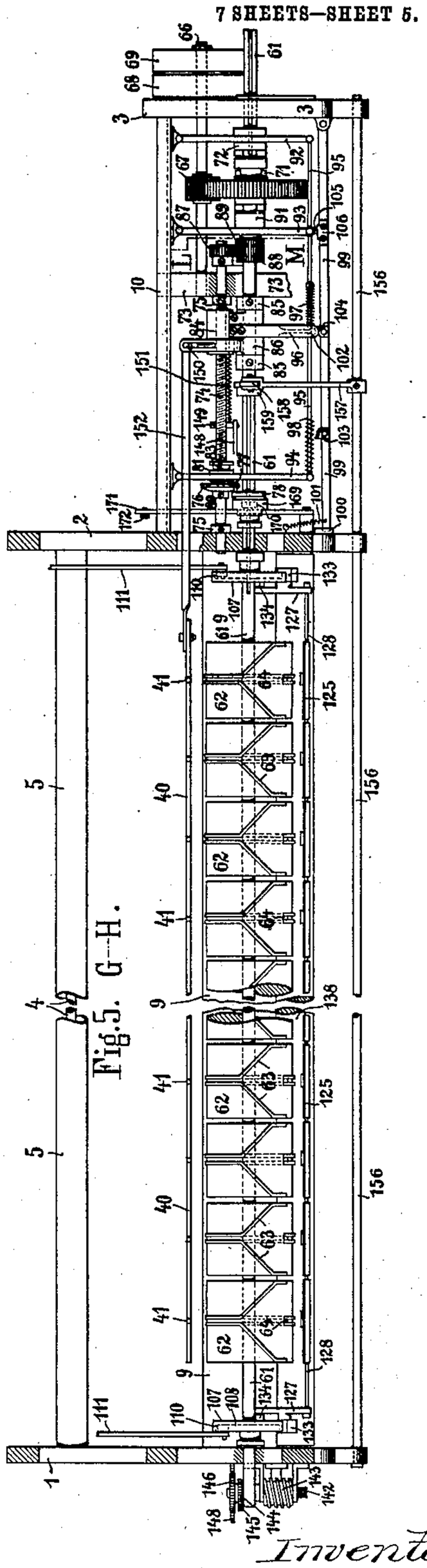

Fig. 5. G–H.

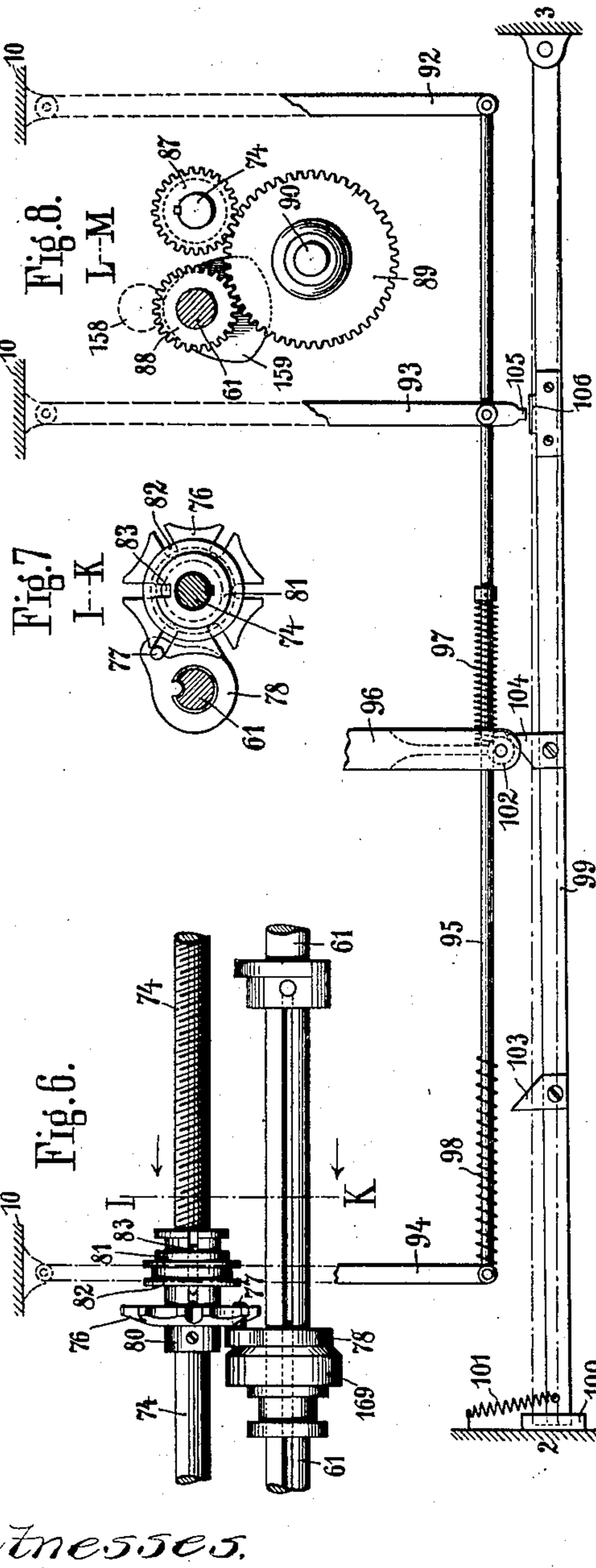

Fig. 8. L–M

Fig. 7 I–K

Fig. 6.

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7 SHEETS—SHEET 6.

Fig. 9.

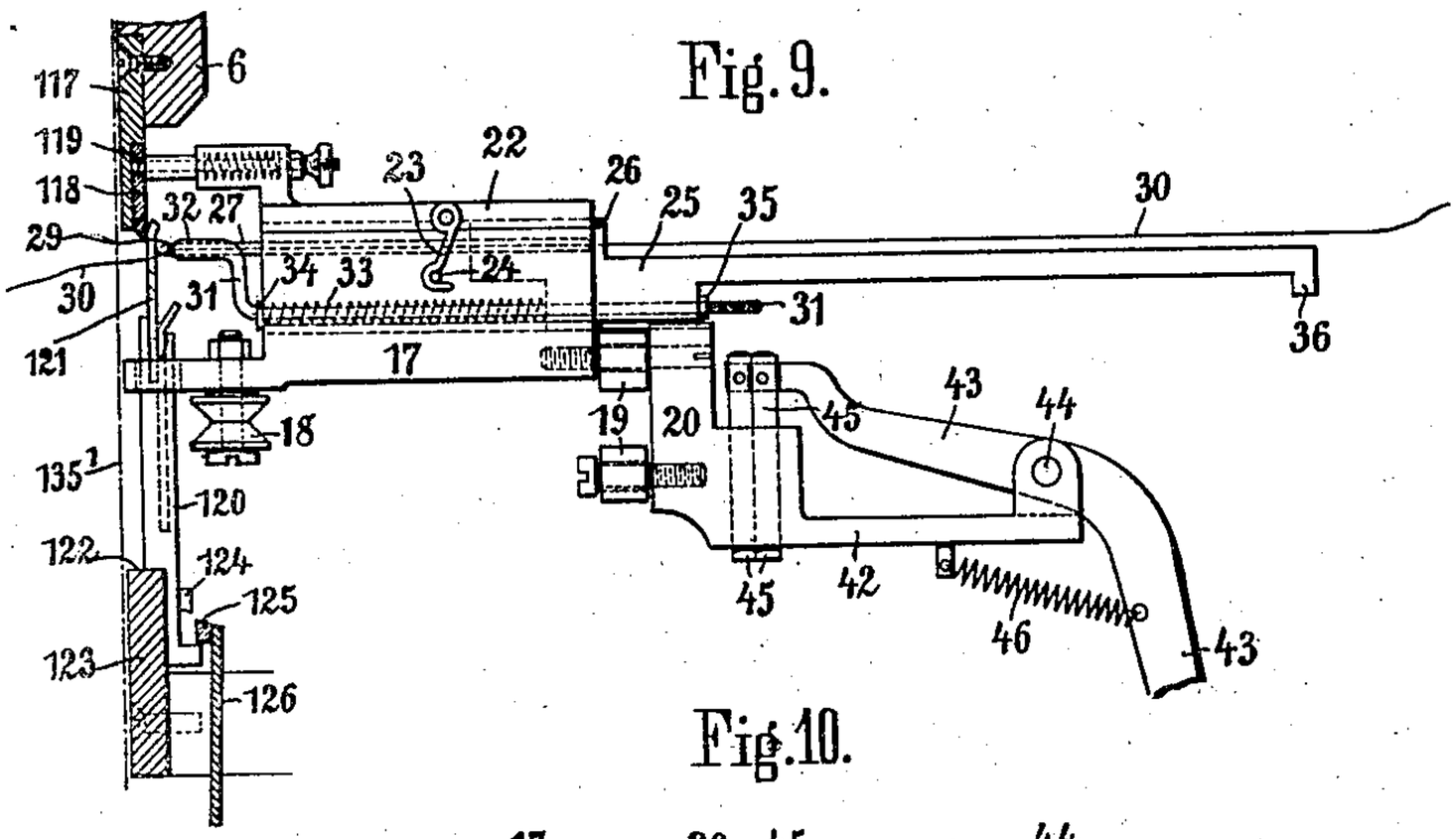


Fig. 10.

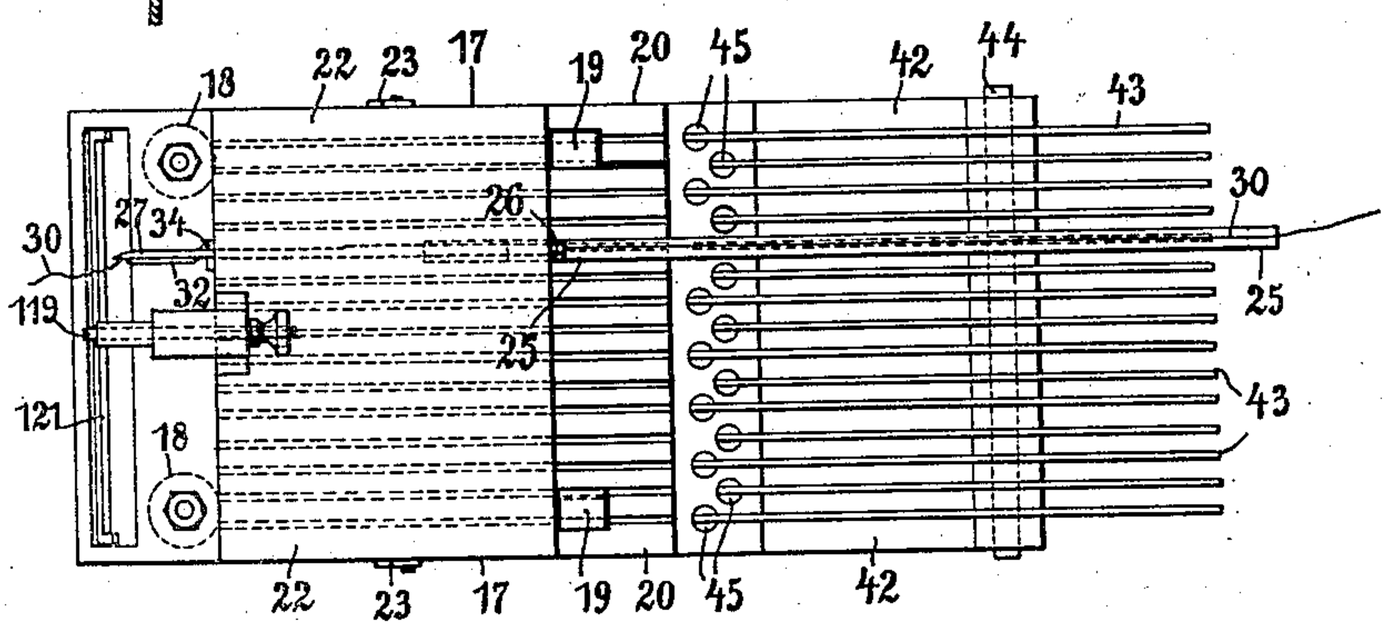
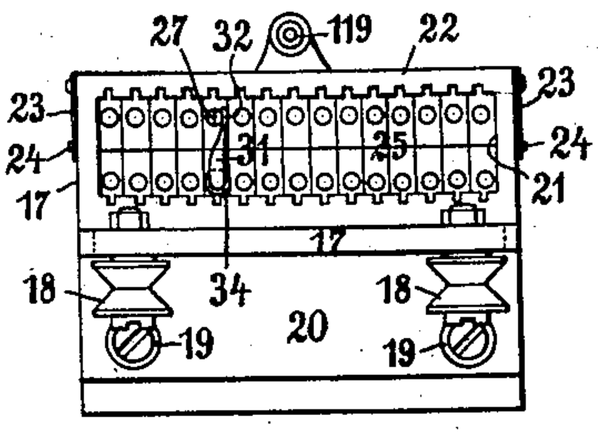


Fig. 11.



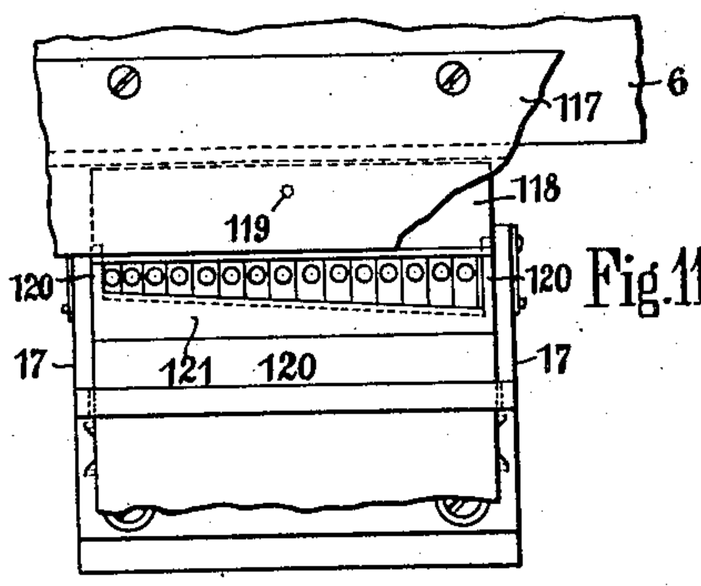


Fig. 11a.

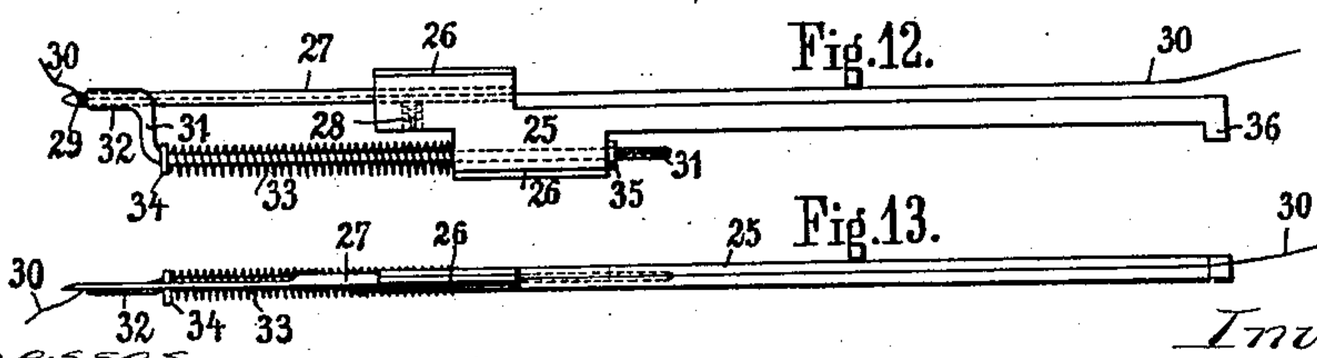


Fig. 12.

Fig. 13.

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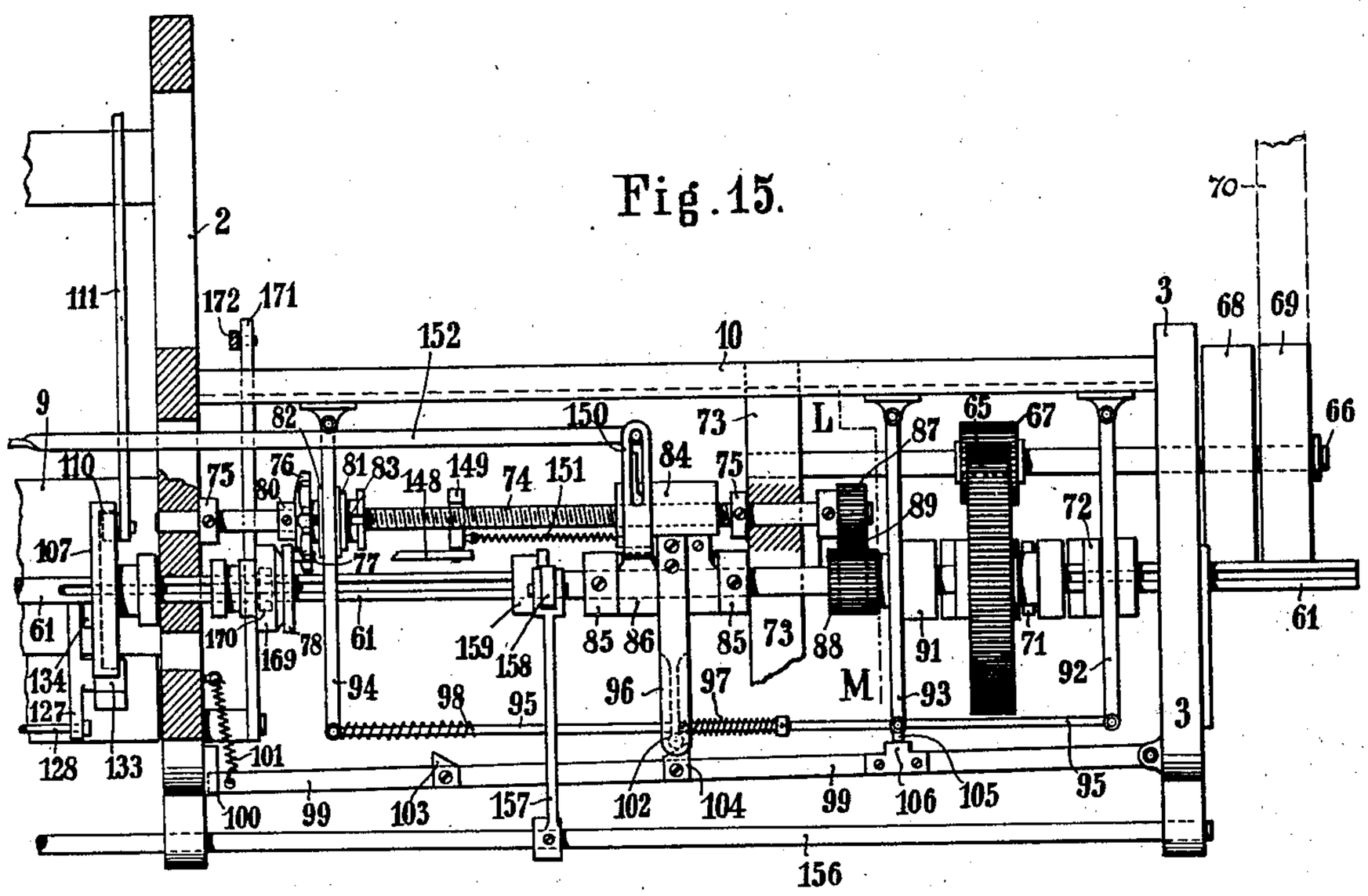
APPLICATION FILED AUG. 19, 1905. 7 SHEETS—SHEET 7.

Fig. 15.



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UNITED STATES PATENT OFFICE.

FRANZ KLEUTGEN, OF BENEL, GERMANY.

MACHINERY FOR EMBROIDERING A FABRIC WITH PILE-THREADS IN PATTERNS.

No. 876,562. Specification of Letters Patent. Patented Jan. 14, 1908.

Application filed August 19, 1905. Serial No. 274,894.

To all whom it may concern:

Be it known that I, FRANZ KLEUTGEN, a citizen of the Kingdom of Prussia and German Empire, residing at Benel, in the Kingdom of Prussia and German Empire, have invented certain new and useful Improvements in Machinery for Embroidering a Fabric with Pile-Threads in Patterns, of which the following is a specification.

This invention relates to machinery for embroidering a fabric with pile-threads in patterns in which a governing apparatus, driven by the machine brings any one of several needles of a set or series to the working point of the set or series of needles and into the proper working position. The invention also allows of the working point of the set or series of needles being moved across the fabric step by step in a direction perpendicular to the forward movement thereof but back again in a single movement. Furthermore, according to this invention, several sets or series of needles with their governing apparatuses are so arranged side by side that they can embroider the fabric simultaneously. By this invention fabrics of any length and width can be embroidered with patterned pile of various colors with the help of a suitable pattern apparatus such as a jacquard or a tappet apparatus for example, without the machine requiring more attention than a weaving loom.

In the accompanying six sheets of drawings, Figure 1 shows a section of the machine taken on the line E—F of Fig. 2. Fig. 2 is a front view of the machine with the spool frame, the jacquard apparatus and some of the other parts omitted. Fig. 3 is a section taken on the line A—B of Fig. 2. Fig. 4 is a side view, drawn to a larger scale, of the machine as seen from C—D of Fig. 2. Fig. 4[a] is an enlarged detail view. Fig. 5 is a sectional plan taken on the line G—H of Fig. 3. Fig. 6 shows a part of Fig. 5. Fig. 7 is a section taken on the line I—K of Fig. 6. Fig. 8 is a section taken on the line L—M of Fig. 5. Figs. 6, 7, and 8 are drawn to a larger scale than Fig. 5. Fig. 9 is a side view to a larger scale of a carriage. Fig. 10 is a corresponding plan. Fig. 11 is a corresponding front view. Fig. 11[a] shows a cutting off apparatus. Figs. 12 and 13 show respectively a side view and a plan of a needle pusher, and Fig. 14 a plan of the combs. Fig. 15 is an enlarged view of the parts between frame members 2 and 3 of Fig. 5.

The general framework of the machine consists of two similar side frames 1 and 2 and a smaller frame 3. The frames 1 and 2 are connected together by means of a rod 4 passing through a distance tube 5, and cast iron beams 6, 7, 8 and 9 extending between the frames 1 and 2. The beam 9 is also supported in the middle by means of a frame 9′. The frame 3 is connected to the frame 2 by means of four cast iron beams 10, 11, 12 and 13 and a bar 14. The beam 8 that connects the frames 1 and 2 has in front a guide 15 of triangular section. On the rear side it is furnished above and below and behind with machined surfaces 16 which also serve as guides. On the guides 15 and 16 run several carriages 17 with rollers 18 and 19, and a guide 20. The carriages 17 have rectangular grooves 21 which are covered with cover plates 22. The cover plates 22 are fastened to the carriages 17 by means of hooks 23 which engage with pins 24 on the carriages 17. In the grooves 21 are placed side by side several pushers 25; in the arrangement shown in the drawings there are fifteen pushers in each carriage. In Figs. 9 and 10 only one pusher is shown. Each pusher 25 has guides 26 above and below which move in corresponding grooves in the carriages 17 and cover plates 22. From the front of each pusher 25 projects a hollow needle 27 which is fixed in place by a clamping screw 28. Each needle 27 has a hole 29 near its point which is directed towards one side. A pile thread 30 is led from behind through each needle and out through the hole 29.

Below the needle 27 each pusher 25 has a hole bored longitudinally through it. In this hole is a sliding rod 31 which is bent upwards in front and bears with its front flat end 32 against the needle at the side of the hole 29. A spiral spring 33 surrounds the rod 31, and bears in front against a disk 34 fixed to the rod 31 and behind against the pusher 25. The spring 33 presses the rod 31 forwards. It is so fixed that it at the same time turns the rod 31 so as to press it against the needle 27. A disk 35 fixed on the rod 31 limits the forward movement of the latter.

The rear prolongations of the pusher 25

have on their undersides projections 36 which take over a projection 37 on a slide 38 (see Fig. 3). The projection 37 and the slide 38 extends from the frame 1 to the frame 2. The slide runs on horizontal guides 39 fixed on the frames 1 and 2. Into the slide 38 is let, behind the projections 36, a longitudinally movable bar 40 which carries for each carriage 17 a projection 41 of the same breadth as the projection 36.

On the lower part 42 of each carriage 17 are arranged on a common fulcrum bolt 44 levers 43 corresponding in number to that of the pushers 25. Each lever 43 is connected with a pin 45 which slides and is guided in a hole in the part 42. The holes for the pins 45 are arranged alternately in two rows to make the arrangement as narrow as possible. The levers 43 are drawn by springs 46 so as to hold the pins 45 normally in the raised position shown in Fig. 9. The ends of the levers 43 are connected with the lifters of a jacquard apparatus 50 by means of cords 47, levers 48 and cords 49, so that before each stitch a lever 43 of each carriage 17 is drawn out in opposition to the action of its spring 46, and thereby the corresponding pin 45 is pressed down.

The jacquard apparatus 50 is placed behind the upper part of the machine on a frame which consists of two columns 51, (see Fig. 1) two columns 52 the longitudinal **I** irons 53 and the transverse channel irons 54. In this frame is also arranged a frame 55 in which are placed on spindles 56 the spools 57 for the pile-threads 30, which are led from the spools 57 round two glass rods 58 and a third glass rod 59 to the needles 27. Between the rods 58 and 59 is hung a small weight 60 on each thread 30.

Below the carriages 17 are fixed, on a shaft 61, a number of drums 62, one for each carriage. (See Figs. 3 and 5). They have each two ridges or cams 63 which from the edges of the drum approach each other until they reach a distance apart suitable for the passage between them of the pins 45, and they then pass parallel to one another round the remaining part of the circumference of the drums. At the place where the channel or groove, thus formed by the ridges or cams, ends, is fixed a tappet 64 which rises to the height of the ridges or cams. The shaft 61 extends at both sides of the machine beyond the frames 1 and 3. On this shaft runs loosely a toothed wheel 65 which is rotated by a shaft 66 through a toothed pinion 67 (see Figs. 5 and 15). On the shaft 66 is a loosely pulley 68 and a fast pulley 69 which are driven by a belt 70 from any suitable motor or shafting. The toothed wheel 65 is held in position by a bracket 71, fixed to the frame 3, taking into a groove in its boss. The boss of the toothed wheel 65 is furnished with claws on both sides which fit into coupling clutches sliding on the shaft 61. One of these clutches, 72, engages with its feather into a long groove in the shaft 61, and when put into gear connects the shaft 61 with the toothed wheel 65.

The shaft 61 moves step by step longitudinally. After it has made a number of these movements (in the case shown in the drawing 40 movements) it moves back at one single stroke. In order to move the shaft 61 longitudinally a spindle 74 is mounted in bearings in the frame 2 and in a step-shaped bridge 73 connecting the tie beams 10 and 12, and is prevented from moving longitudinally by means of a set collar 75. On the spindle 74 is mounted loosely a star-wheel 76. Into the teeth of this star-wheel takes the driving pin 77 which turns round with the shaft 61 on a boss 78. The boss 78 takes with its feather in a long groove in the shaft 61 and is prevented from moving longitudinally by means of a bracket 79 fixed to the frame 2. The star-wheel 76 lies between a set collar 80 and a sleeve 81 fixed to the spindle 74. On the sleeve 81 is a movable ring 82 on which is arranged a key 83 which can engage with the wheel 76, so that the latter can be connected with the sleeve 81 and thereby with the spindle 74. The spindle 74 is screw-threaded, and has a nut 84 movable on the thread. To the nut is secured a sleeve 86 which surrounds the shaft 61 and engages between the set collars 85. On the spindle 74 is also fixed a toothed wheel 87 which is geared by means of an intermediate wheel with a long toothed wheel 88 running loosely on the shaft 61. The intermediate wheel 89 turns loosely on a stud fixed to the bridge 73. The toothed wheel 88 is fixed to a coupling clutch 91 and can be moved with it on the shaft 61 and be connected with the toothed wheel 65.

The clutch-levers 92 for the clutch 72, 93 for the clutch 91, and 94 for the ring 82 are pivoted to the connecting beam 10, and are pin-jointed to a movable rod 95 which passes through a hole in the arm 96 connected to the sleeve 86. Between the arm 96 and each of the levers 93 and 94 is arranged on the rod 95 a spiral spring 97 and 98 respectively. A lever 99, pivoted to the frame 3, and which moves between two guides 100 fixed to the frame 2, is pressed by a spring 101 against a roller 102 on the end of the arm 96. This roller strikes, in the two end positions of the sleeve 86, against two inclined planes 103 and 104. The end 105 of the clutch-lever 93 can bear against the one or the other side of a projection 106 fixed to the lever 99, according to the position of the said clutch lever. On the shaft 61 is fixed by the side of each frame 1 and 2 a disk 107 which has an eccentric groove 108. These disks are held in position by means of brackets 109. In the groove 108 run rollers 110 which are connected by rods 111 with the studs 112 of

the levers 113. The levers 113 are pivoted to the frames 1 and 2. They have slots 114 in which move connecting bolts 115 for connecting rods 116 which transmit the motion of the levers 113 to the slide 38.

To the connecting beam 6 is fixed a guide 117 on which slide cutters 118; one of these cutters belongs to each carriage 17 and is of the same width as the carriage. Spring pins 119 mounted on the cover plates 22 of the carriages 17, engage in holes in the cutters 118 and cause the latter to move with the carriages. On the carriages 17 are also arranged in front of the rollers 18 vertically moving pushers 120. These are provided with cutters 121 which work in conjunction with the cutters 118 and have oblique cutting edges. The pushers 120 rest in their lowest positions with projections 122 on the longitudinal bar 123 which is of the same length as the beam 6. At the lower part of the pushers and behind the same are fixed projections 124 which work in conjunction with the projections 125. These latter are fixed to plates 126 which are hinged to a shaft 128 mounted in bell-crank levers 127. Each plate is connected with a lever 129 which, like the levers 43, is actuated by a cord 130, a lever 48 and a cord 49 by the jacquard apparatus. The plates 126 bear by projections 131 against the beam 8 towards which they are drawn by springs 132. The two bell-crank levers 127 are pivoted in bearings 133 and have on their rear arms rollers 134, which are pressed back once at each revolution of the shaft 61 by the tappets 135 fixed to the disks 107, whereby the shaft 128 and with it the plates 126 and projections 125 are raised.

The ground-fabric to be embroidered 135′ is wound on to a beam 136 and runs from there over a guide roller 137 to the lower tension roller 138 and then through between the longitudinal bar 123 and the connecting beam 7 to the upper tension roller 139 and round the guide roller 140 to the finished goods roller or cloth beam 141. The two tension rollers 138 and 139 are connected at each end with worm-wheels 142, with which gear the worms 143. On the shafts of these worms are fixed toothed wheels 144, each two of which, at each side of the machine, gear with a toothed rack 145. On the shafts of the lower worms 143 are loose toothed wheels 146, each of which carries a retaining pawl on an arm 147 said pawls engaging the teeth of wheels 144 (see Figs. 4 4ª and 5). With the wheels 146 gears a toothed-rack 148 which is guided upon brackets fixed on the frames 1 and 2. A lever 149 engages with the toothed rack, and is, at each backward movement of the sleeve 86, carried therewith by an arm 150 fixed to the said sleeve, and is drawn backwards against a stop by means of a spring 151. The arm 150 is connected with the bar 40 by a bar 152. The end of the bar 152, provided with a roller, runs, when the slide 38 moves, in a corresponding slot in the arm 150. Thereby the bar 40 and the shaft 61 are moved longitudinally.

On the connecting beam 7 is arranged, opposite the row of needles 27, a row of plates 153 whose planes stand perpendicular to the fabric, so that between each two positions where a needle can stab through the fabric stands a plate. The spaces between the plates 153 are except the part lying opposite the needles filled with pieces of lining and the resulting grating is fixed to the beam 7 by two guides 154 and 155.

In front of the grating is a shaft 156 carried in bearings in the frames 1, 2 and 3. On this shaft is a lever 157 carrying a roller 158, which runs on a tappet disk 159 fixed on the shaft 61 and movable with the latter. The tappet on the disk 159 raises the lever 157 after each row of stitches is made. On the shaft 156 are also fixed several levers 160 which carry at their ends a shaft 161. On this shaft 161 are fixed the combs 162, which engage between the grating plates 153 and lie in front of the fabric. The combs 162 together extend along the whole working length of the machine. On the shaft 161 are also fixed two levers 163 to which are pivoted bell-crank levers 164 which are drawn by means of springs 165 against stops 166 fixed to the frames 1 and 2. The vertical arms of the bell-crank levers 164 have shoulders 167 with which they can bear upon the stops 166. The horizontal arms of the bell-crank levers 164 bear upon pins 168 on the levers 163. The toothed racks 145 have pins 168′ with which they raise the levers 163 when they move upwards.

With the boss 78 on the shaft 61 is connected a tappet disk 169 on which runs the roller 170 of a lever 171 pivoted to the frame 2. This lever is connected with the jacquard apparatus by means of a rod 172, so that each movement of the lever 171 moves the jacquard apparatus one card forward.

The machine works as follows:—After the ground fabric 135′ has been placed upon the rollers 136, 137, 138, 139, 140 and 141 in the usual manner, and a pile-thread 30 has been threaded through each needle 27 of the carriages 17, and forward out at the hole 29, (a differently colored thread may be used for each needle), the machine is set in motion by traversing the belt 70 on the fast pulley 69. At this moment the nut 84 is back against the sleeve 81, the shaft 61 is therefore in its furthest position to the left, the clutch 72 is consequently coupled with the toothed wheel 65 and the clutch 91 is out of gear; the levers 163 are raised so that the bell-crank levers 164 rest with their shoulders

167 on the stops 166. One of the levers 43 of each carriage 17 is drawn back by the jacquard apparatus, so that the pin 45 belonging to that lever is pressed down and bears upon the corresponding drum 62. The shaft 61 rotates and with it the drums 62, the pin 45 is pushed by the oblique part of one of the ridges or cams 63 and is slid along thereby in such manner that it is conducted into the narrow groove or channel between the two ridges or cams. Thereby the corresponding carriage 17 is so moved laterally that the needle belonging to the pin 45 that has been pressed down, is brought into the central plane of its corresponding drum 62. In the same plane stands the projection 41 of the bar 40 which belongs to the relative carriage. The disks 107 turn with the drums 62 and push forward, after the pin 45 has entered the groove or channel between the ridges or cams 63, the slide 38 with the projections 41, by means of the connecting rods 111 and 116 and the levers 113. The pusher 25 belonging to the pressed-down pin 45 is thereby pressed forward and pushes the front end of its needle 27 through the ground-fabric 135′, which is thereby pressed against the comb formed by the plates 153 between which plates the needle pass. At the moment when the needle 27 has entered the fabric as far as the eye 29 the end 32 of the rod 31 clamps the thread 30 fast to the fabric. The needle is drawn back by the slide 38 and leaves behind in front of the fabric a loop of the pile-thread. When on the newly-placed jacquard card not only the hole for the relative lever 43 but also the hole for the lever 129 is struck, the latter is also drawn back and the projection 125 takes under the projection 124, while by means of the tappet 135 the bell-crank lever 127 is turned and the shaft 128 raised. The raising of the shaft takes place just after the needles 27 have left the fabric. Through the raising of the shaft 128, when the projection 125 takes under the projection 124, the pusher 120 with the cutter 121 is also raised, and the said cutter acting in concert with the cutter 118 cuts off the pile-thread 30 behind the ground fabric.

While the slide 38 is being drawn back the shaft 61 has rotated so far that the pressed-down pin 45 has reached close in front of the tappet 64 on the drum 62. Simultaneously the tappet disk 169 has pressed the lever 171 downwards, and has moved the jacquard apparatus one card forward. Thereby the previously withdrawn levers 43 are left to the action of the springs 46 and the pins 45 are raised. The tappet 64 secures the upward movement of the pins in the event of the springs 46 being loose or weak. The fresh jacquard card now causes another pin 45 to be pressed down in each carriage, the selected pin being dependent upon the position of the hole in the card that has been struck. By the further rotation of the drums 62 to the extent to which the ridges or cams 63 run obliquely towards one another this pin and the needle belonging to it are brought into the central plane of the drum 62, and the stabbing, drawing back and cutting-off are repeated. During the above mentioned part of the rotation of the drum 62 the driving pin 77 turns the star-wheel 76 to the extent of one tooth, and turns with it the spindle 74. The nut 84 is thereby moved the space of one stitch to the right, taking with it the shaft 61 and drums 62. The second stitch over each drum thus takes the place of one stitch further to the right because the working point of the relative carriage lying in the section line of the central plane of the drum 62 and of the plane of the needles 27 is moved a space to the right.

It is obvious that the hole in the jacquard card for the lever 129 of each carriage is only struck when the next following card contains the hole for another lever 43 to which belongs another needle 27 and another thread 30. Otherwise if the thread 30 is not to be changed the projections 124 and 125 remain out of engagement and the upward movement of the projection 125 remains without action on the cutter 121. After the number of stitches corresponding to the distance apart of two adjacent working points, commonly called a repeat, has been made, the tappet disk 159 comes under the roller 158 of the lever 157, raises it and thereby turns the shaft 156 with the levers 160 so that the combs 162 are drawn back. At the same time the levers 163 are drawn back, and the shoulders 167 slip down from the stops 166, as the bell-crank levers 164 are held fast against the action of the springs 165 by the pins 168. Immediately the roller 158 has fallen again from the tappet of the disk 159 the combs 162 move forward again and take, in the position shown in Fig. 4, under the just formed pile-loops. Simultaneously, the arm 96 of the sleeve 86 strikes against the right hand inclined plane 104 and presses the lever 99 back in opposition to the spring 101, so that the end 105 of the lever 93 is released from the projection 106. By the action of the spring 97 the rod 95 is then moved to the right, and takes the clutch 72 and key 83 out of gear and puts the clutch 91 into gear. The rotation of the shaft 61 is thereby stopped while the toothed wheel 88 is driven by the toothed wheel 65, and by means of the toothed-wheels 89 and 87 turns the spindle 74 backwards, so that the nut 84 is moved again to the left, taking with it the shaft 61. The projection 106 of the lever 99 engages the end 105 of the clutch lever 93 from the left

side under the action of the spring 101. On its backward movement the nut 84 strikes with its arm 150 against the lever 149, pushes the toothed rack 148 to the left and thereby turns the toothed wheels 146 and with them the toothed wheels 144, the worms 143, the worm wheels 142 and the tension rollers 138 and 139 so far forward that the fabric 135 is moved up by the space apart of two rows of stitches. Thereby the pins of the toothed racks 145 raise the levers 163, the shoulders 167 of the bell-crank levers 164 take on the stops 166, and the combs 162 take again the position shown in Fig. 3 in which they free the needle way from the previously formed pile loops. When the nut 84 has again reached the sleeve 81 the arm 96 strikes the inclined plane 103 and presses the lever 99 back again so that the projection 106 releases the end 105 and the rod 95 moving to the left under the action of the spring 98 puts the clutch 72 and the key 83 into gear, and takes the clutch 91 out of gear. The above described series of operations are then repeated and another row of stitches is made.

The above described machine is capable of many modifications. For example instead of a jacquard apparatus a cam machine may be arranged as a pattern apparatus for each carriage. The richness of the pattern would not be thereby prejudiced. The carriages 17 instead of being movable in straight guides as shown may be made to move in any other path readily suggested by those skilled in the art. The rod 31 which serves for clamping the thread may be dispensed with without the working capability of the machine being materially affected, as the threads on being inserted into the fabric are clamped between the needle and fabric without this clamp 31. The clamping apparatus only serves to insure the fixing. The clamping apparatus is, however, necessary when solid needles are used instead of hollow ones, which can be done with the above described machine.

By skilful arrangement of patterns and colors extraordinary effects can be produced with the machine above described. The ground of the pattern may have one and the same color over the whole surface of the fabric for one pattern of embroidery. Each carriage may therefore contain one thread of the color of the ground. Each needle may have a thread of a different color not taking into account a thread in each carriage for the ground of the patterns. There can thus be produced with this machine a multiplicity of colors and patterns in one piece of work, which in consequence of the complicated arrangement can hardly be produced by hand work.

What I claim as my invention and desire to secure by Letters Patent of the United States is:

1. A machine for embroidering a fabric with pile threads in patterns having in combination with a frame, means for holding a fabric, a set or series of needles, means for automatically bringing any one of the needles of said set or series to the working point of said set or series and into the working position, means for stabbing the working needle through the fabric and means for moving a fabric and said set or series of needles relatively to each other step by step.

2. A machine for embroidering a fabric with pile threads in patterns having in combination with a frame, means for holding a fabric, a set or series of needles, means for automatically bringing any one of the needles of said set or series to the working point of said set or series and into the working position, means for stabbing the working needle through the fabric and means for moving a fabric and said set or series of needles relatively to each other step by step in two directions crossing one another at right angles.

3. A machine for embroidering a fabric with pile threads in patterns having in combination with a frame, means for holding a fabric, a plurality of sets or series of needles; means for automatically bringing any one needle of said sets or series of needles to the working point of its set or series of needles and into the working position, means for stabbing the working needles through the fabric and means for moving a fabric and said sets or series of needles relatively to each other step by step.

4. A machine for embroidering a fabric with pile threads in patterns having in combination with a frame, means for holding a fabric, straight guides attached to the frame parallel to the fabric-holders, a carriage adapted to run on said guides, a plurality of pushers in said carriage movable at right angles to said guides, a needle in each of said pushers, pins vertically movable in said carriage and corresponding to the number of said pushers, a drum below said carriage, means for rotating said drum, two ridges or cams surrounding said drum, and adapted to receive between them one of said pins and move the carriage, a pattern apparatus adapted to press each of said pins down to said drum, a slide movable at right angles to said guides and having a projection engaging with one of said pushers, means for reciprocating said slide and means for moving a fabric and said needles relatively step by step.

5. A machine for embroidering a fabric with pile threads in patterns having in combination with a frame, means for holding a fabric, straight guides attached to the frame parallel to the fabric-holders, a plurality of

carriages adapted to run on said guides, a plurality of pushers in each of said carriages movable at a right angle to said guides, a needle in each of said pushers, pins vertically movable in said carriages and corresponding to the number of said pushers, a drum below each of said carriages, means for rotating said drums, two ridges or cams surrounding each of said drums and adapted to receive between them one of said pins and move the carriage, a pattern apparatus adapted to press one pin in each carriage down to its drum, a slide movable at a right angle to said guides and having projections corresponding to the number of said carriages, each engaging with one of the pushers of its carriage, means for reciprocating said slide, means for progressing said drums and projections simultaneously and step by step parallel to said guides, and means for moving a fabric and said needles relatively step by step.

6. A machine for embroidering a fabric with pile threads in patterns having in combination with a frame, means for holding a fabric, straight guides attached to the frame parallel to the fabric-holders, a plurality of carriages adapted to run on said guides, a plurality of pushers in each of said carriages movable at a right angle to said guides, a needle in each of said pushers, pins vertically movable in said carriages, and corresponding to the number of said pushers, a drum below each of said carriages, means for rotating said drums, two ridges or cams surrounding each of said drums and adapted to receive between them one of said pins, a pattern apparatus adapted to press one pin in each carriage down to its drum, a slide movable at a right angle to said guides, and having projections corresponding to the number of said carriages, each engaging with one of the pushers of its carriage, means for reciprocating said slide, means for progressing said drum and projections simultaneously and step by step parallel to said guides comprising an axially movable shaft supporting said drums, a screw threaded spindle parallel to said shaft, a nut on said spindle, means for axially moving said shaft with said nut, a wheel loose on said shaft, means for continuously rotating said wheel, a clutch adapted to couple and uncouple said shaft with said wheel, a driving pin on said shaft meshing with a star wheel loose on said screw threaded spindle, a key adapted to couple and uncouple said screw-threaded spindle with said star wheel, a toothed wheel 88 loose on said shaft, means for coupling and uncoupling said toothed wheel with said continuously rotating wheel, a toothed wheel 87 rigid on said screw threaded spindle, an intermediate toothed wheel meshing with both said toothed wheels 88 and 87, and loose on a stud connected with the frame and means for moving a fabric and said needles relatively step by step.

7. A machine for embroidering a fabric with pile threads in patterns having in combination with a frame, means for holding a fabric, straight guides attached to the frame parallel to the fabric-holders, a plurality of carriages adapted to run on said guides, a plurality of pushers in each of said carriages movable at a right angle to said guides, a needle in each of said pushers, pins vertically movable in said carriages, and corresponding to the number of said pushers, a drum below each of said carriages, means for rotating said drums, two ridges or cams surrounding each of said drums and adapted to receive between them one of said pins, a pattern apparatus adapted to press one pin in each carriage down to its drum, a slide movable at a right angle to said guides and having projections corresponding to the number of said carriages, each engaging with one of the pushers of its carriage, means for reciprocating said slide, means for progressing said drums and projections simultaneously and step by step parallel to said guides, a shaft, a screw threaded spindle parallel to the shaft, a toothed wheel loose on said shaft, a coupling clutch for said wheel, a key sliding and a nut running on said screw threaded spindle, an arm fastened to said nut with a hole and a roller on its end, three levers hinged to said frame and adapted to move along said toothed wheel, said clutch, and said key, a rod hinged to said three levers and passing through the hole in said arm, spiral springs on said rod at both sides of said arm, a spring actuated lever hinged on the frame at right angles to said three levers, and two inclined planes and a projection on said lever, and means for moving said needles.

8. A machine for embroidering fabric with pile threads in patterns having in combination with a frame, means for holding a fabric, straight guides attached to the frame parallel to the fabric holders, a plurality of carriages adapted to run on said guides, a plurality of needle pushers in each of said carriages movable at a right angle to said guides, a cutter for each of said carriages, means for operating said cutter of each carriage in conjunction with its needle pusher, a needle in each of said pushers, pins vertically movable in said carriages and corresponding to the number of said pushers, a drum below each of said carriages, means for rotating said drums, two ridges or cams surrounding each of said drums and adapted to receive between them one of said pins, a pattern apparatus adapted to press one pin on each carriage down to its drum, a slide movable at a right angle to said guides and having projections corresponding to the number of said carriages, each engaging with one of the pushers of its carriage,

means for reciprocating said slide, means for progressing said drums and projections simultaneously and step by step parallel to said guides, and means for moving a fabirc and said needles relatively step by step.

9. A machine for embroidering a fabric with pile threads in patterns having in combination with a frame for holding a fabric, a plurality of sets or series of needles, means for automatically bringing any one needle of said sets or series of needles to the working point of its set or series of needles and into the working position, means for stabbing the working needles through the fabric, means for moving a fabric and said sets or series of needles relatively to each other step by step, combs extending along the whole working length of the machine, and means for sinking said combs under the pile-loops when formed and for raising them simultaneously with the fabric.

10. In a machine for embroidering a fabric with pile threads in patterns in combination with combs extending along the whole working length of the machine, a shaft on which said combs are keyed, a plurality of levers, on the ends of which said shaft is journaled, a second shaft said levers are keyed on, a lever having a roller on its end and keyed on said second shaft, a tappet disk acting on said roller, two levers fastened to the ends of said first shaft, a bell-crank lever pivoted on and a pin fastened to each of said two levers, the horizontal arms of said bell-crank levers being adapted to bear upon said pins, a shoulder on the vertical arms of the bell-crank levers, two stops fixed to the framing, engaging with said shoulders, and means for rotating and axially alternating said tappet disk and for raising said two levers, substantially as described.

11. A machine for embroidering a fabric with pile threads in patterns having in combination with a frame for holding a fabric, a set or series of needles, needle holders, rods sliding parallel with said needles within the needle holders, and bent to bear with their front ends against the needles, springs adapted to press said rods towards the needle points and to turn them at the same time against the needles, means for bringing any one of the needles of said set or series to the working point of said set or series and into the working position, means for stabbing the working needle through the fabric, and means for moving the fabric and said set or series of needles relatively to each other step by step.

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

FRANZ KLEUTGEN.

Witnesses:

BESSIE F. DUNLAP.

LOUIS VANDORN.