

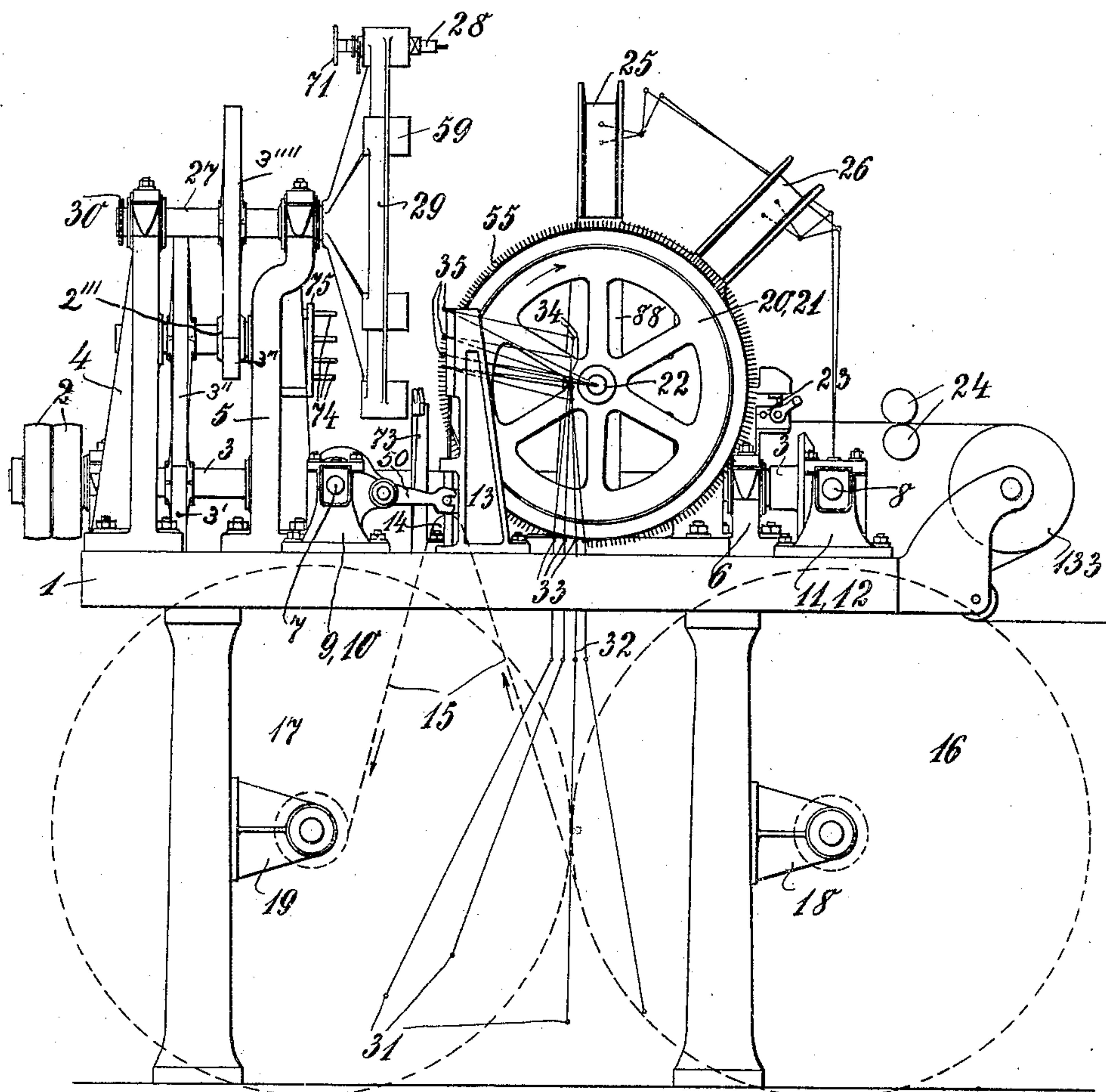
W. P. ZIMMERMANN.
MECHANISM FOR MANUFACTURING CHENILLE STRIPS.
APPLICATION FILED DEC. 31, 1906.

931,365.

Patented Aug. 17, 1909.

11 SHEETS—SHEET 1.

Fig. 1.



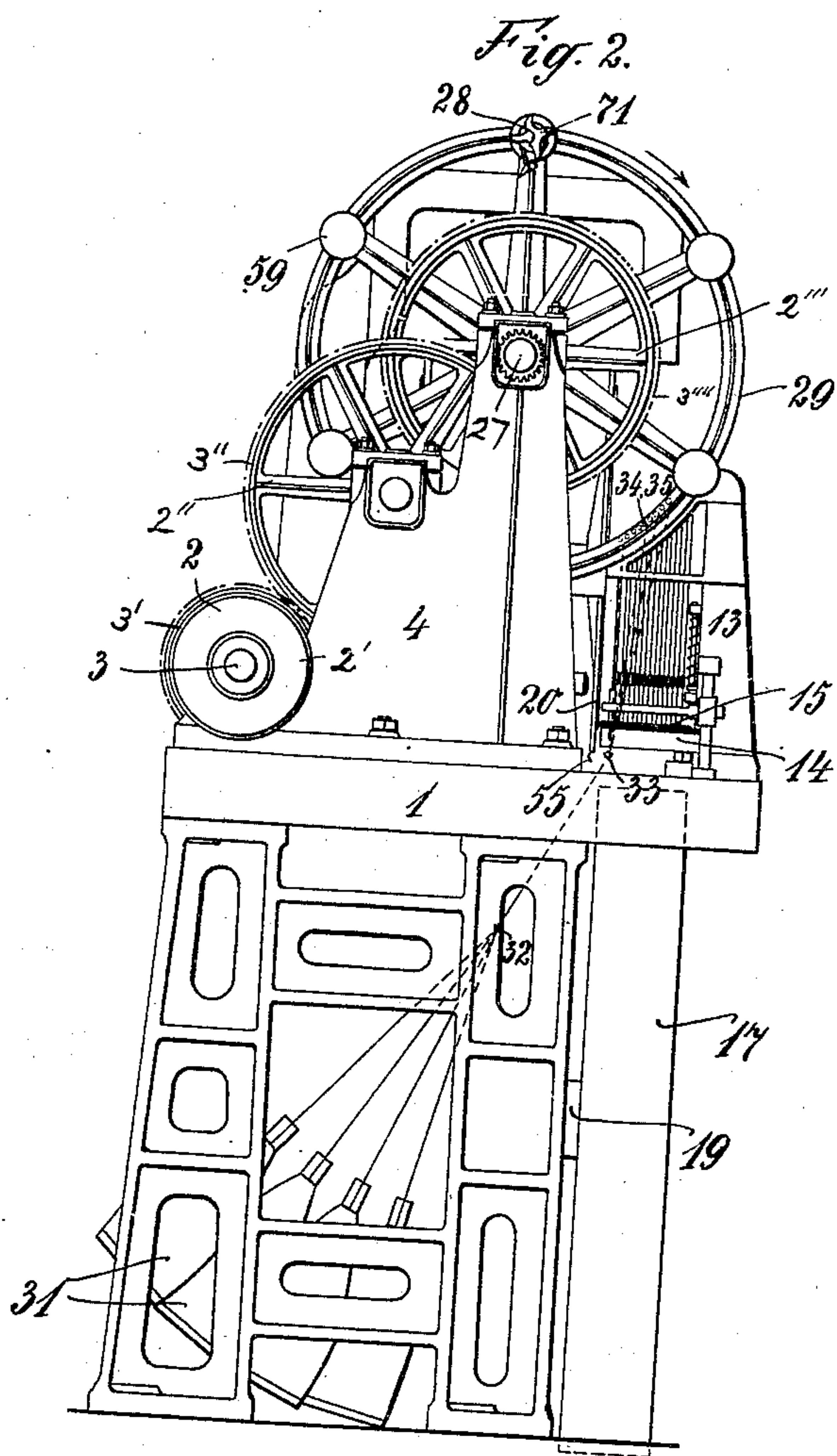
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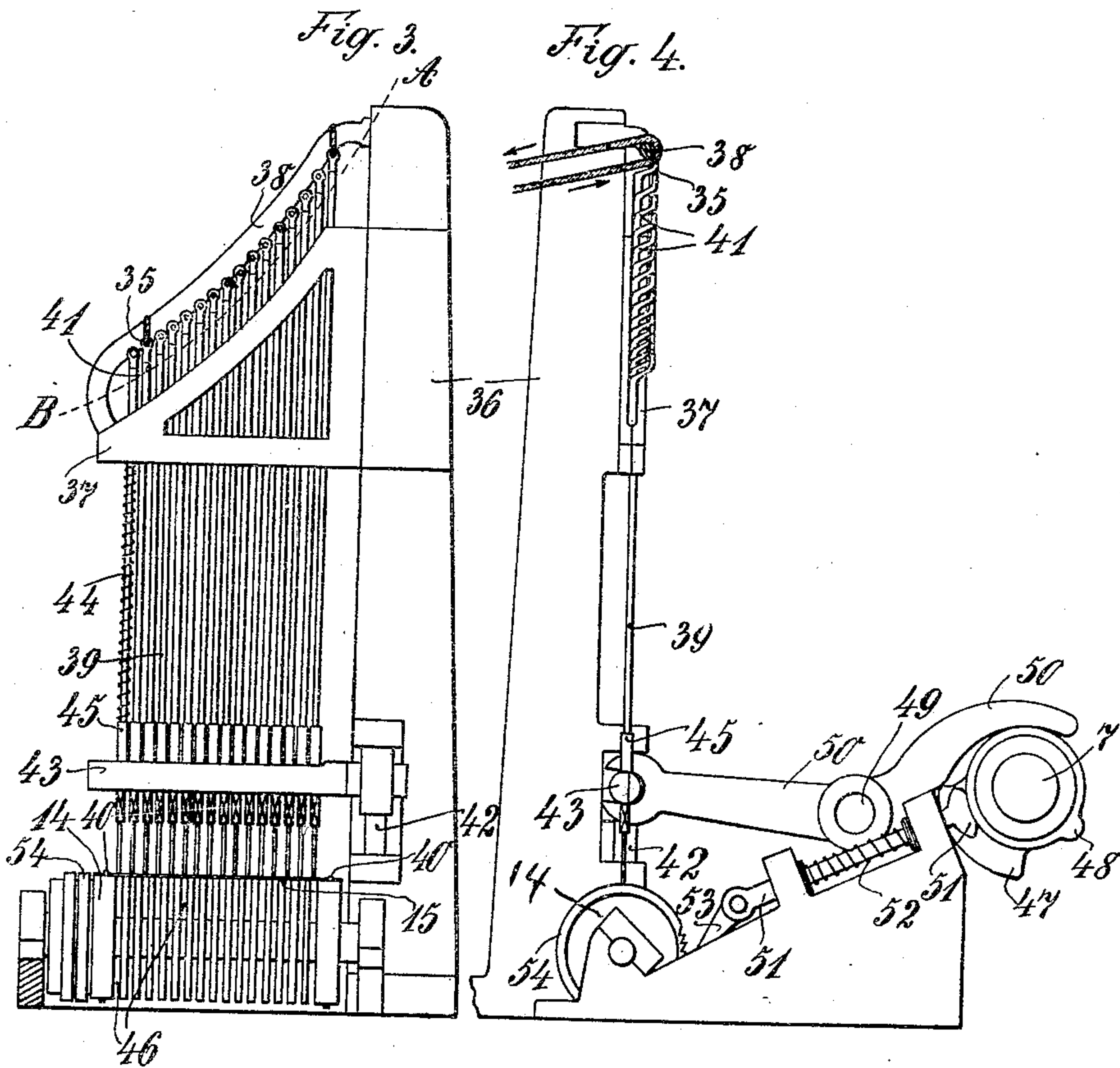
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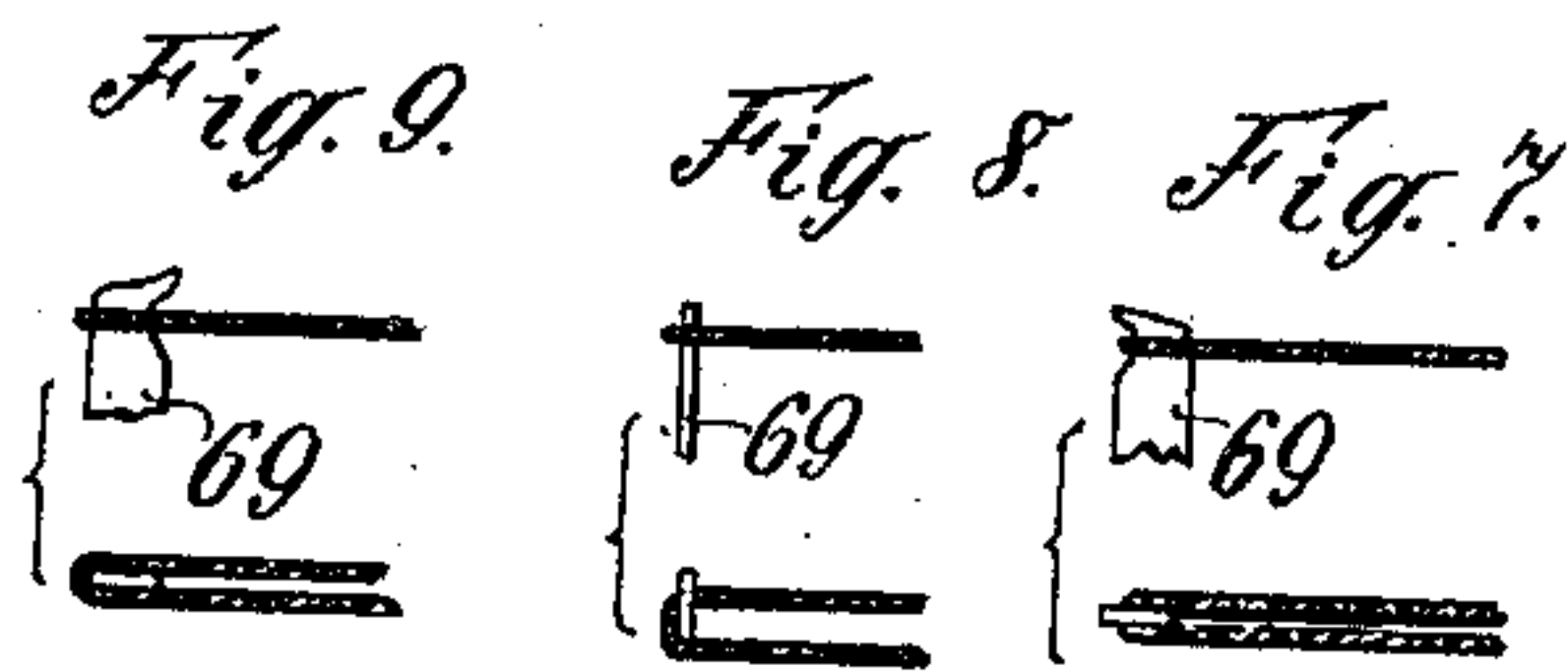
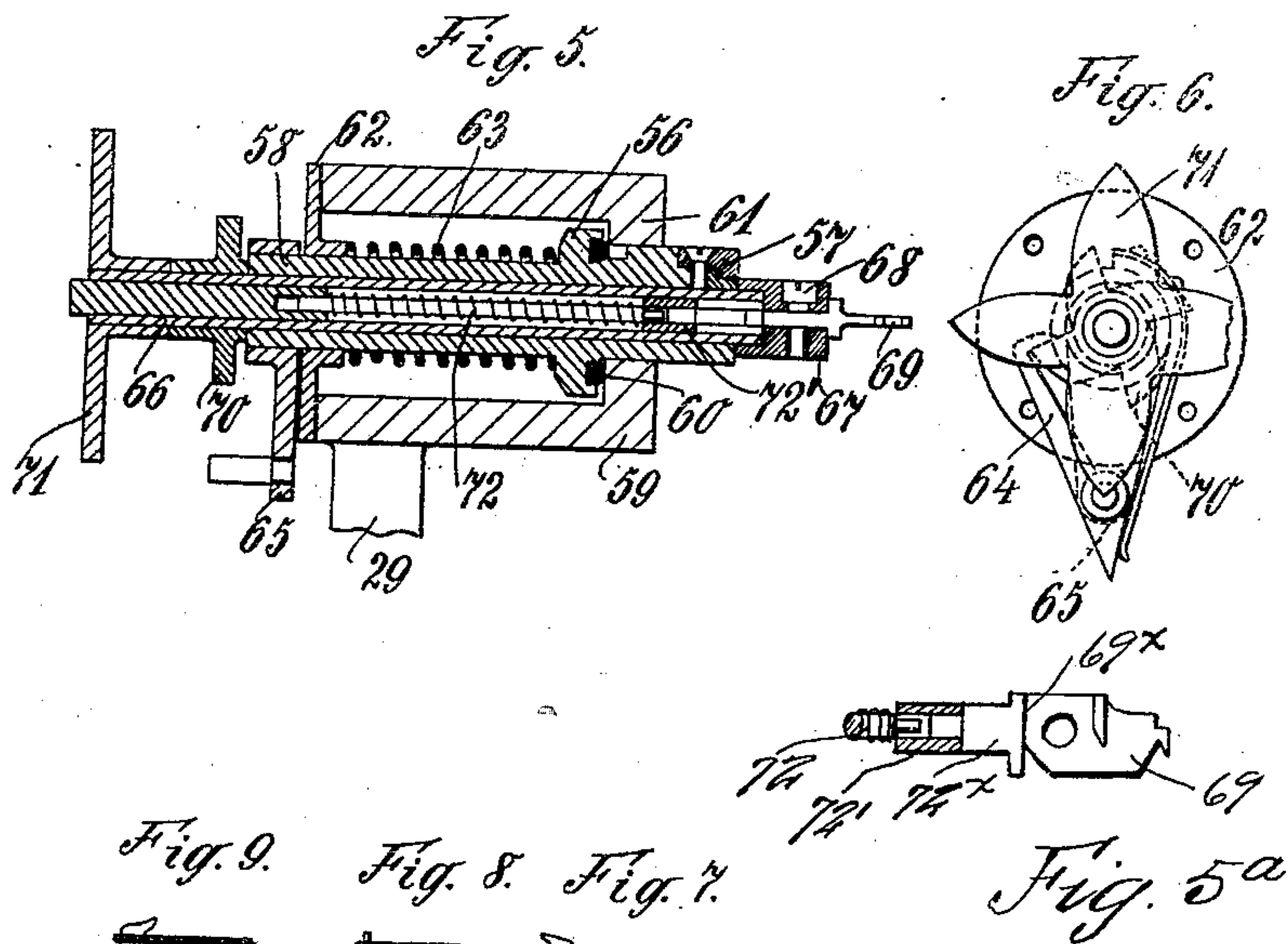


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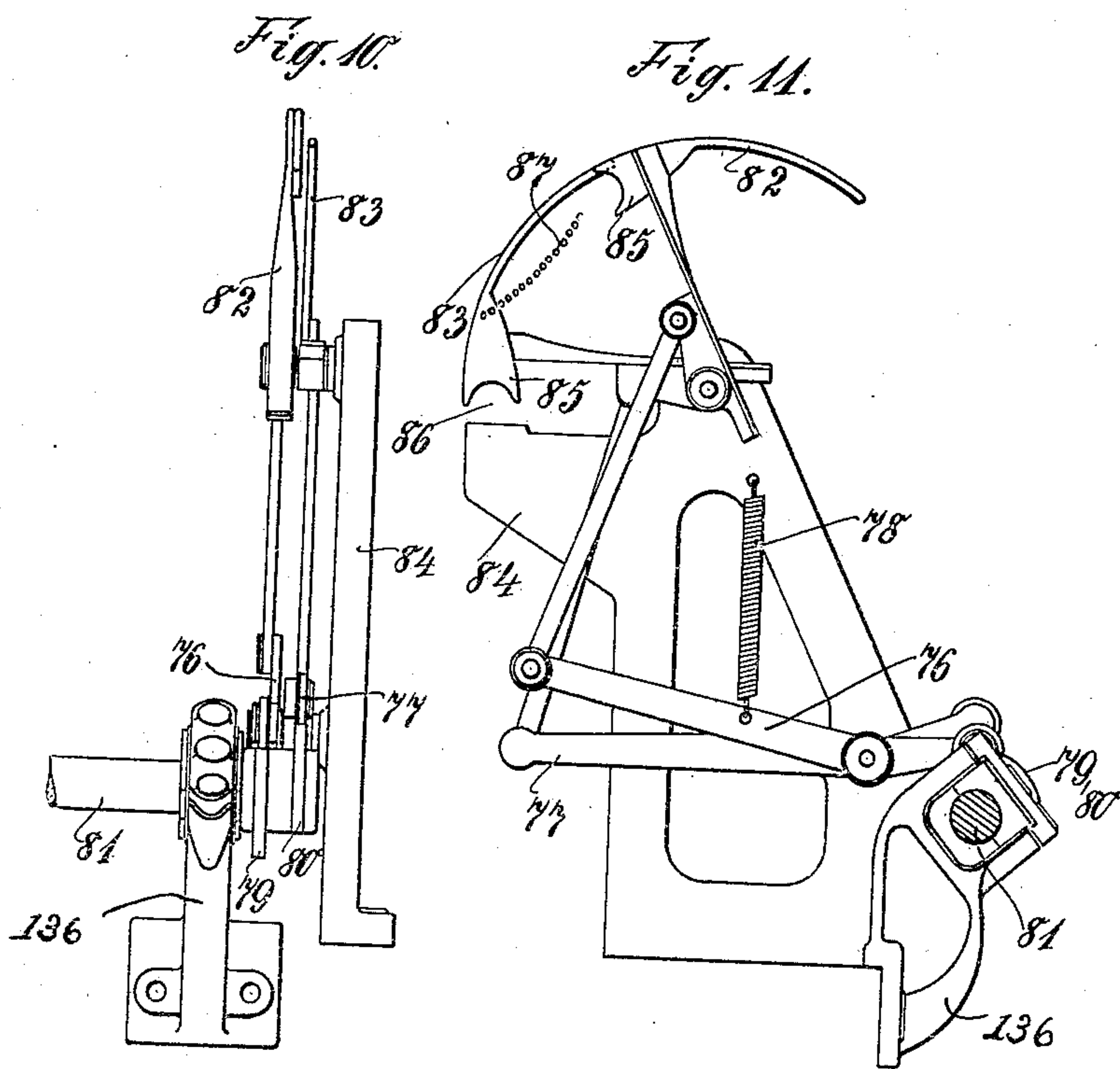


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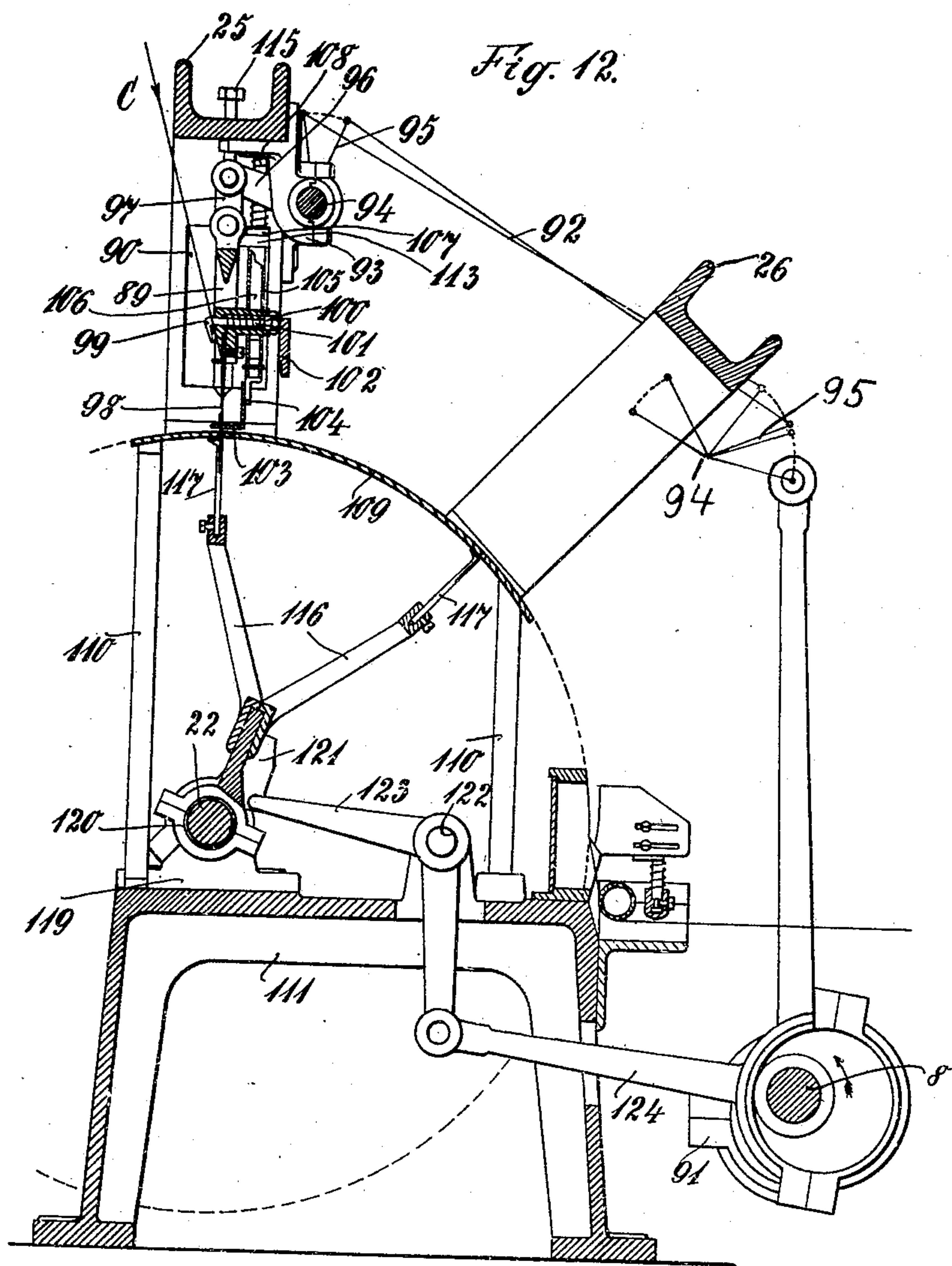
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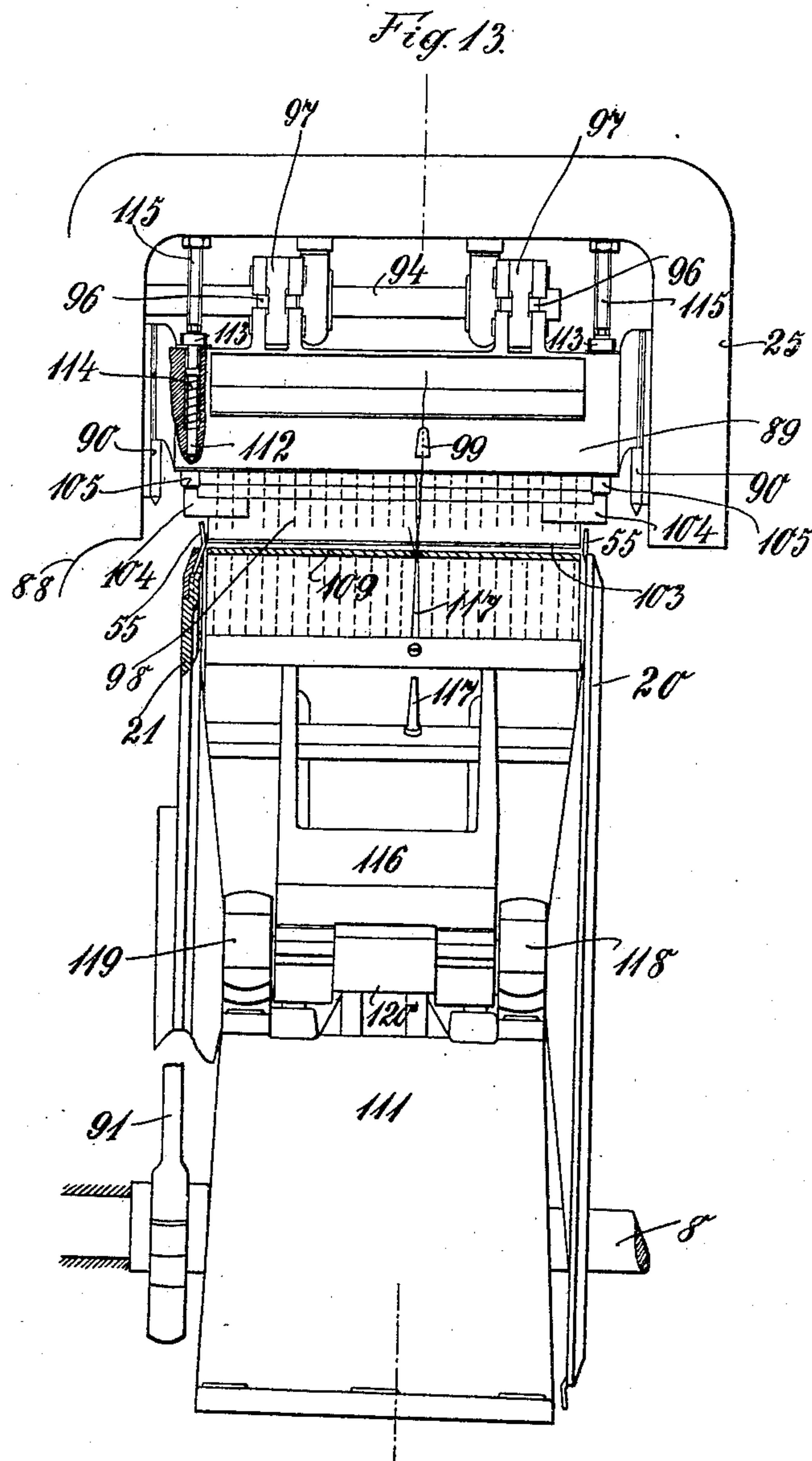
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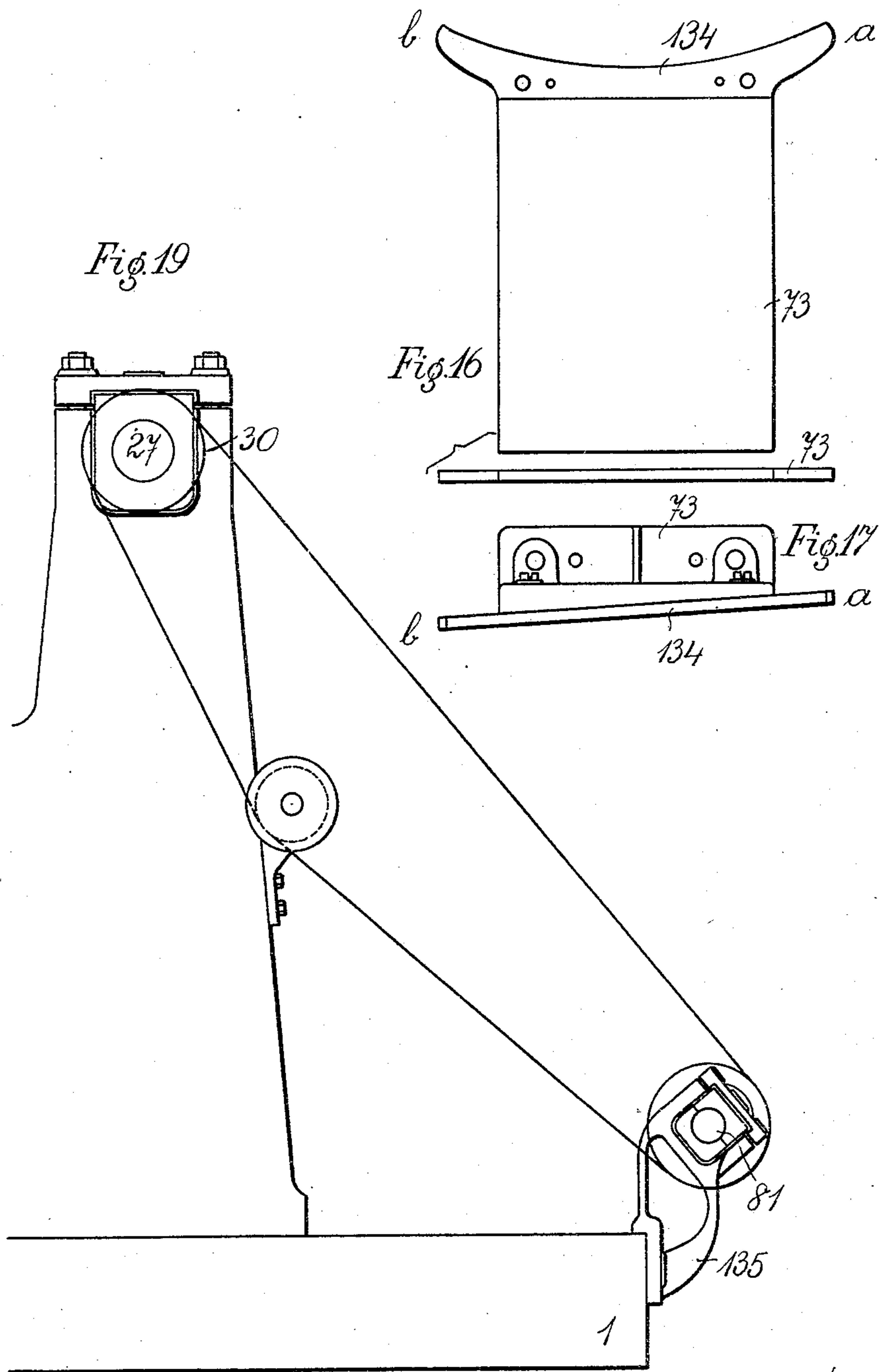
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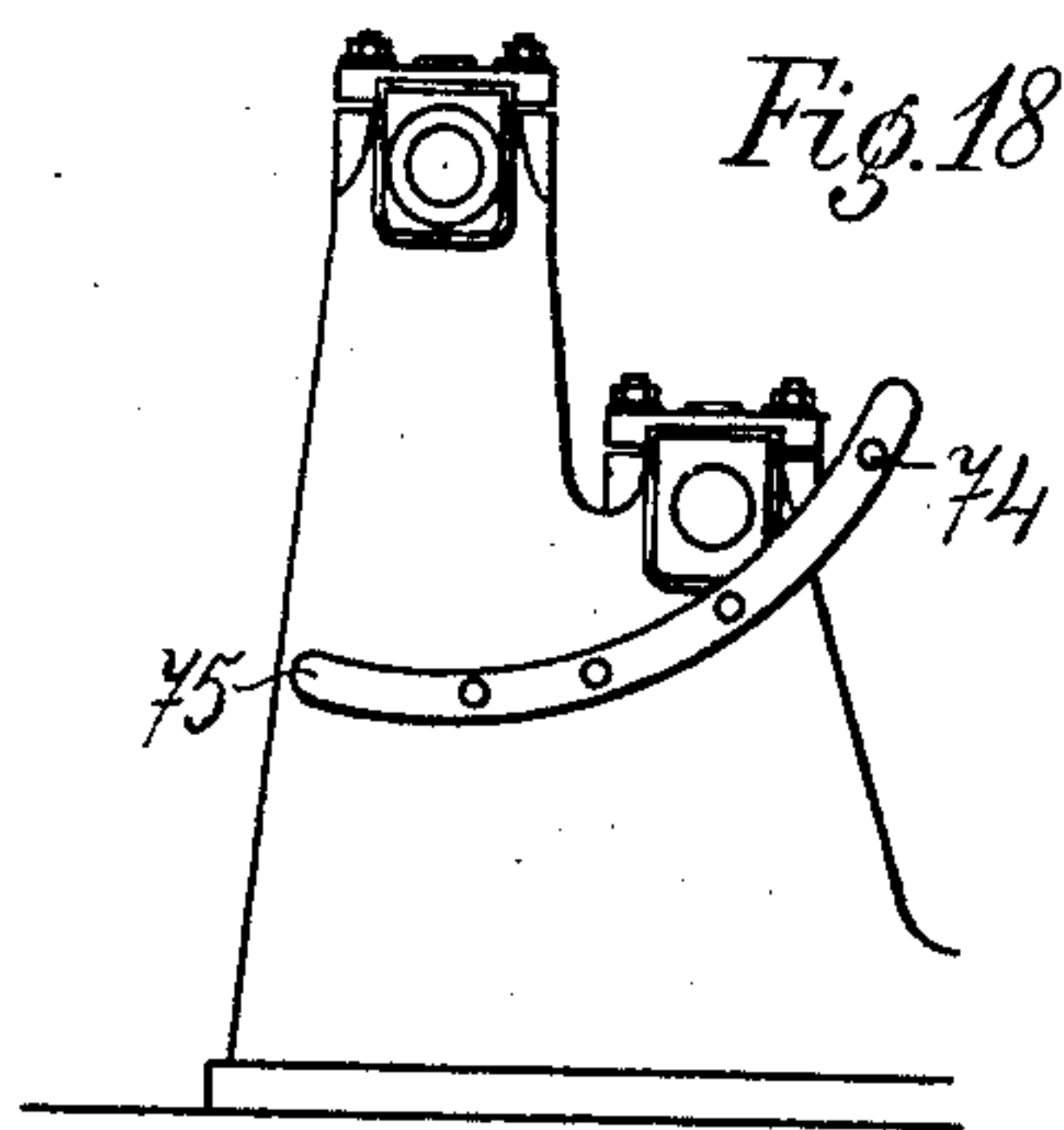
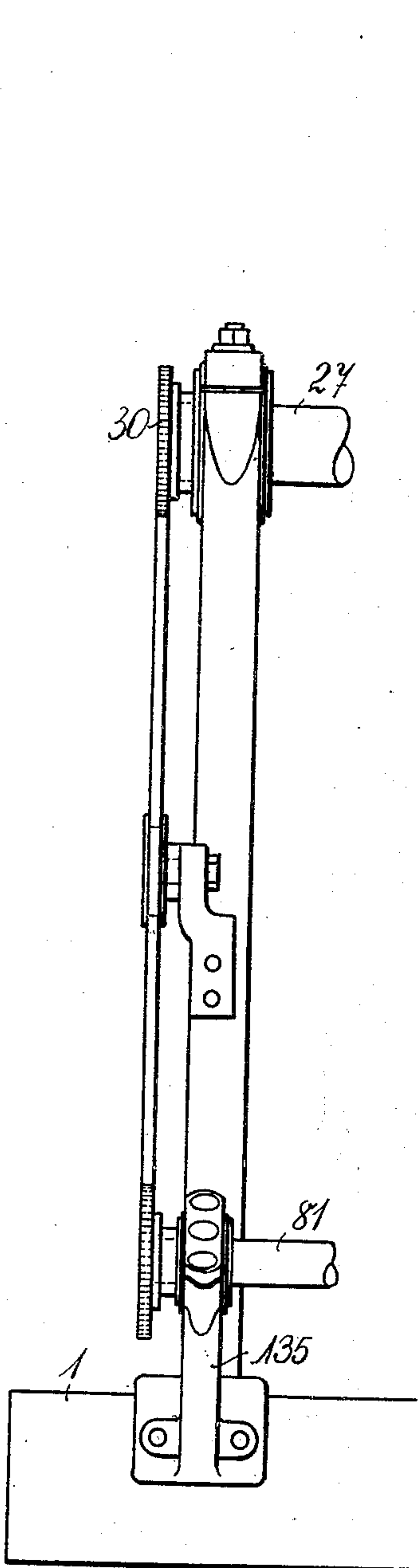
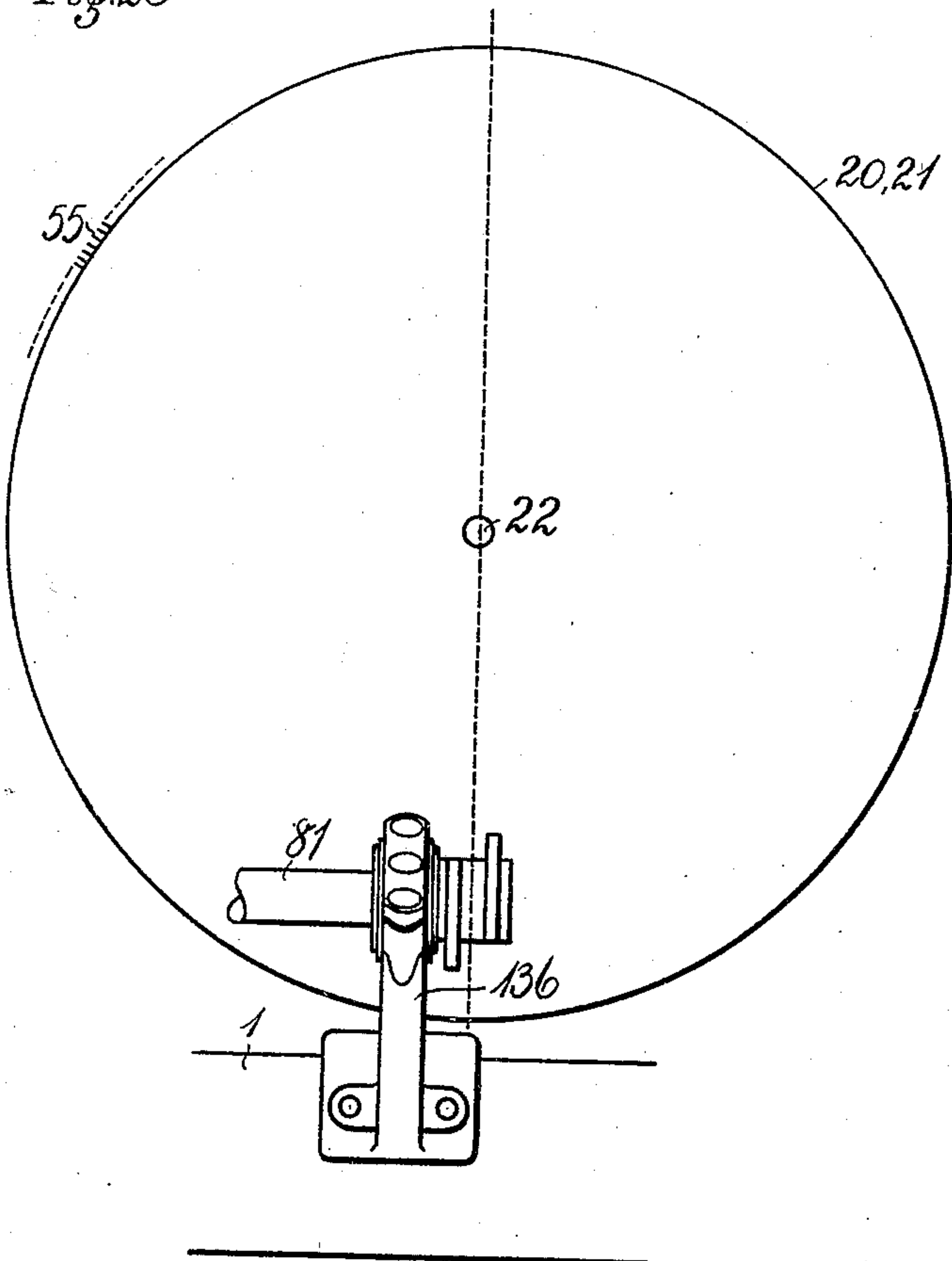


Fig. 20



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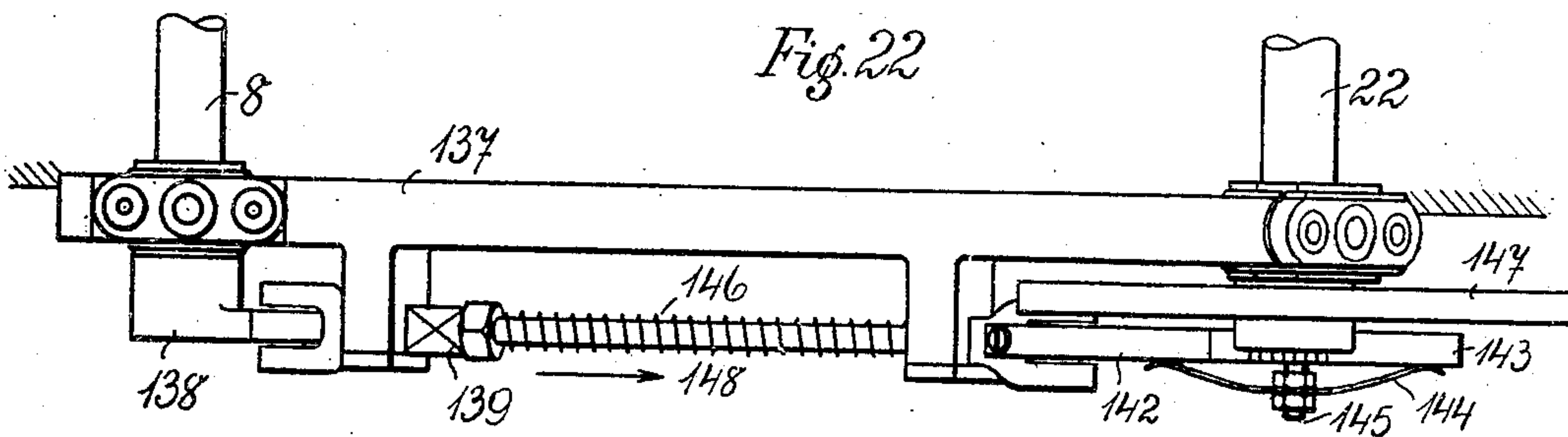
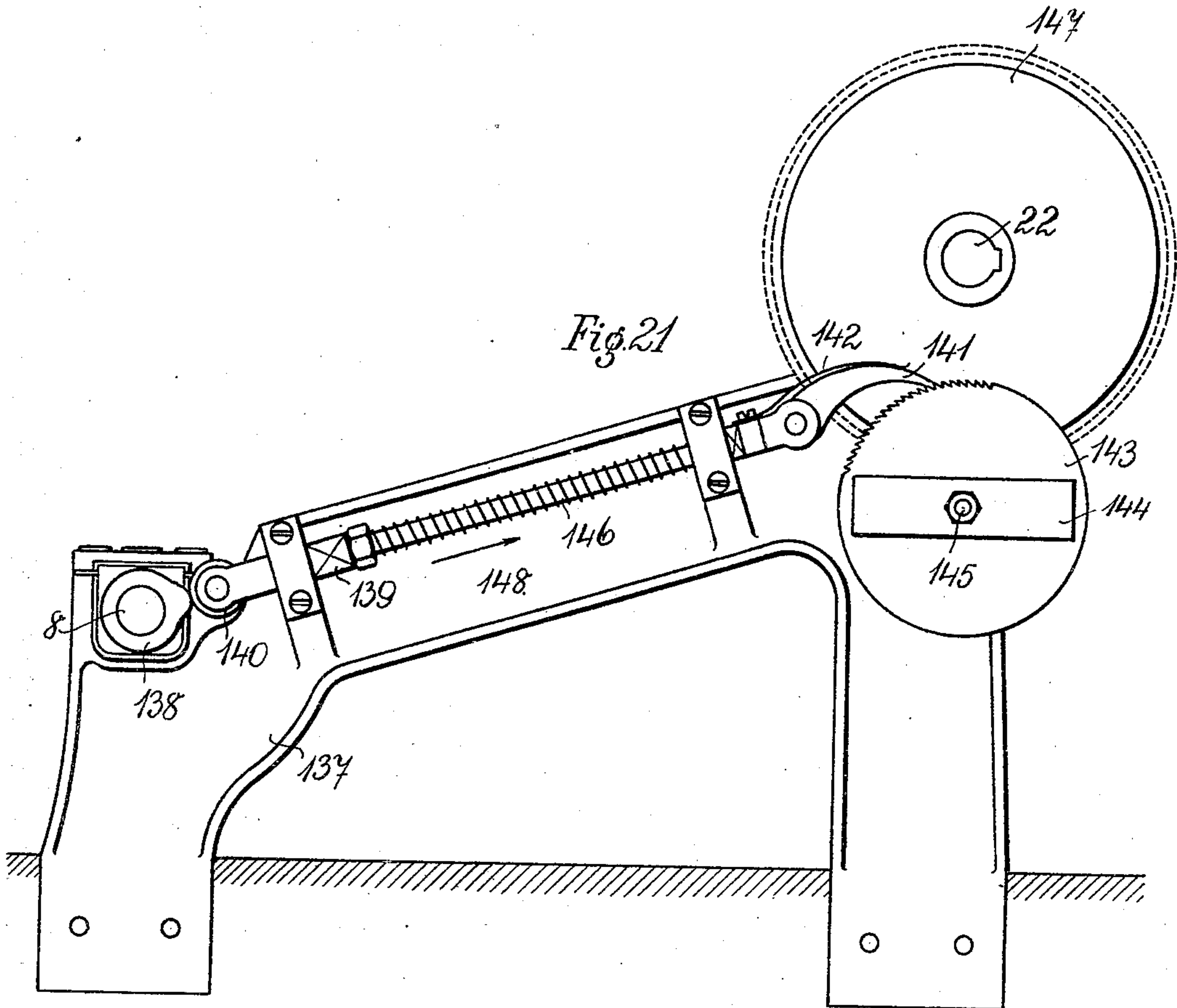
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Fig. 23.

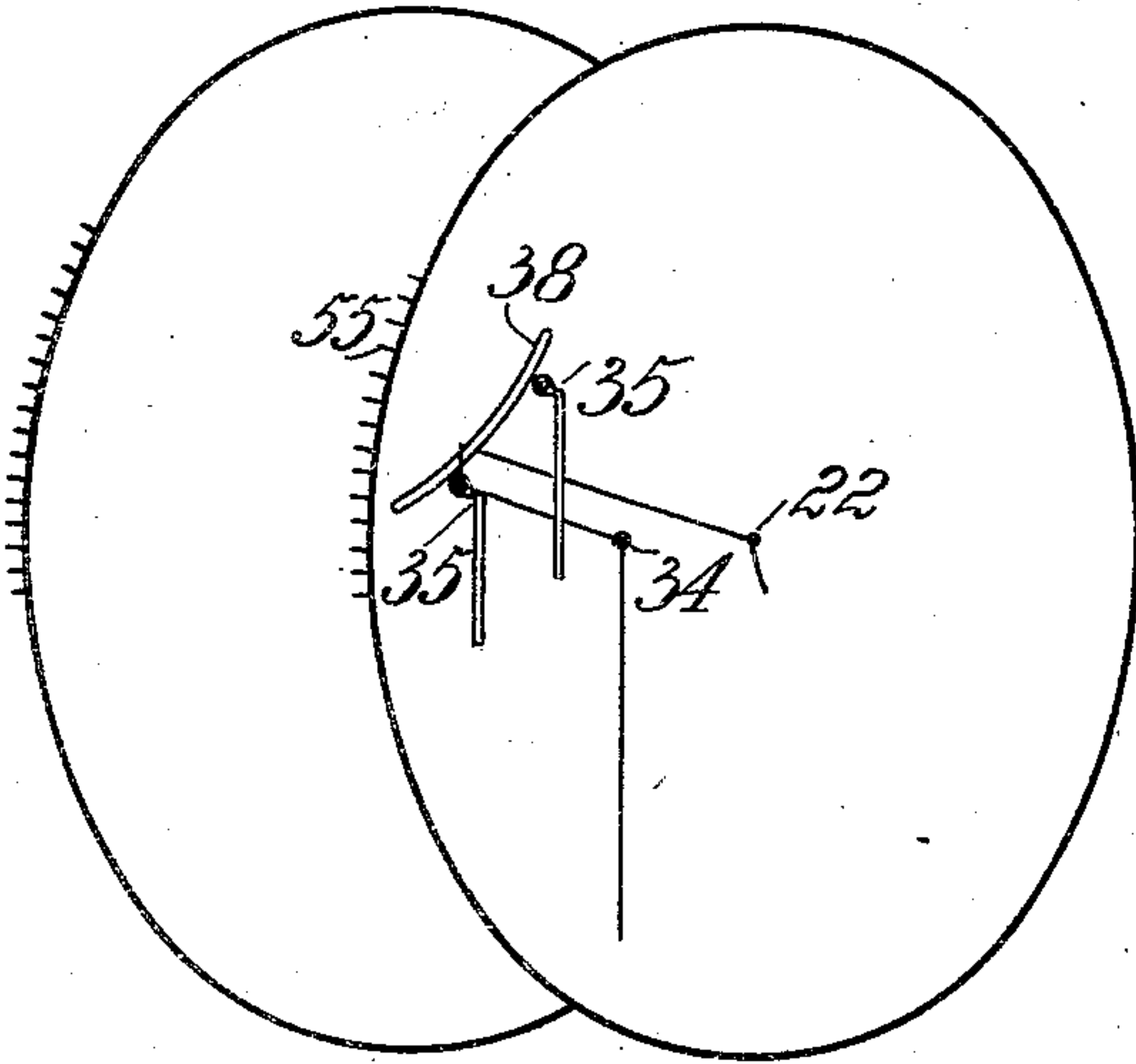


Fig. 24.

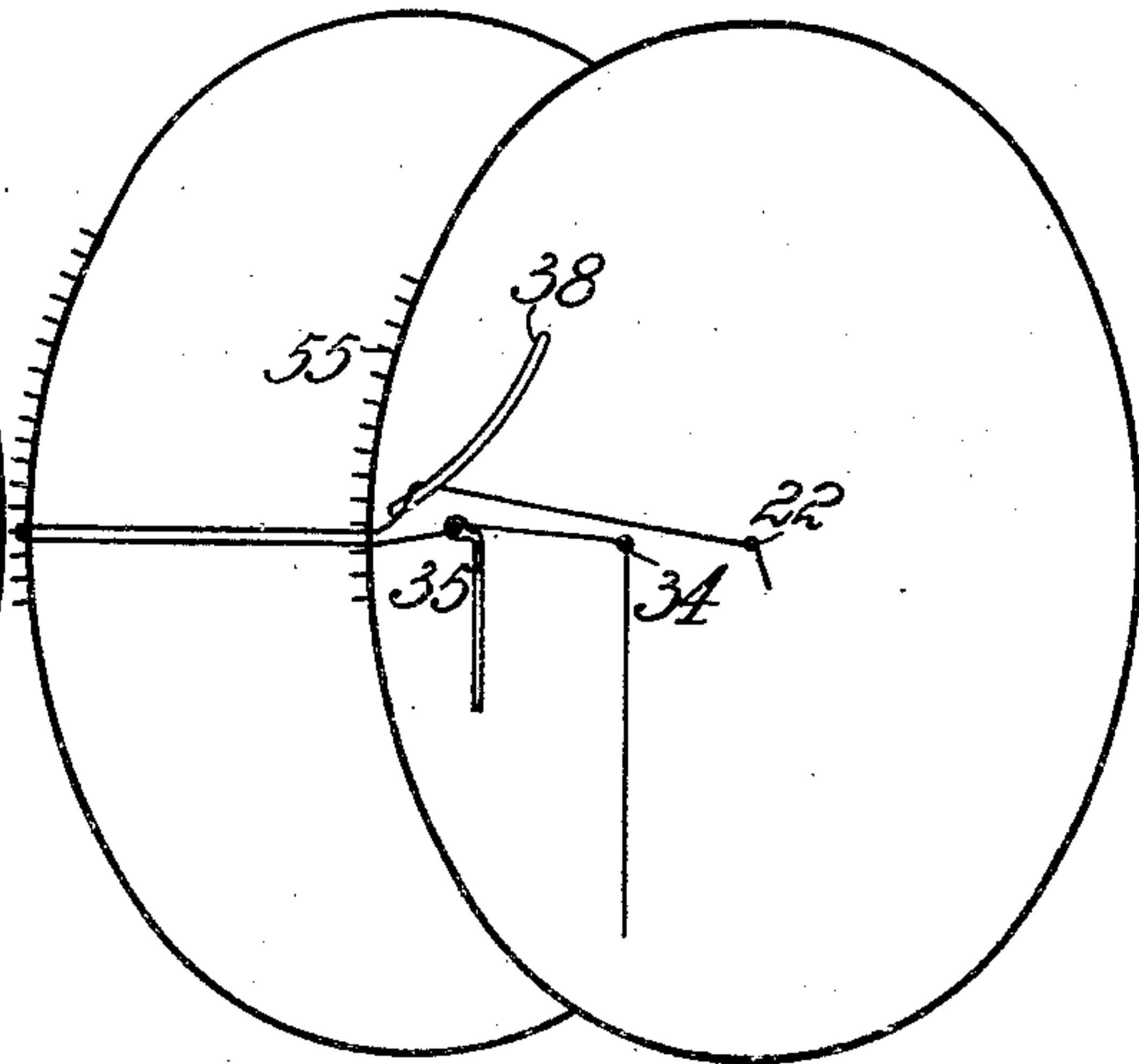


Fig. 25.

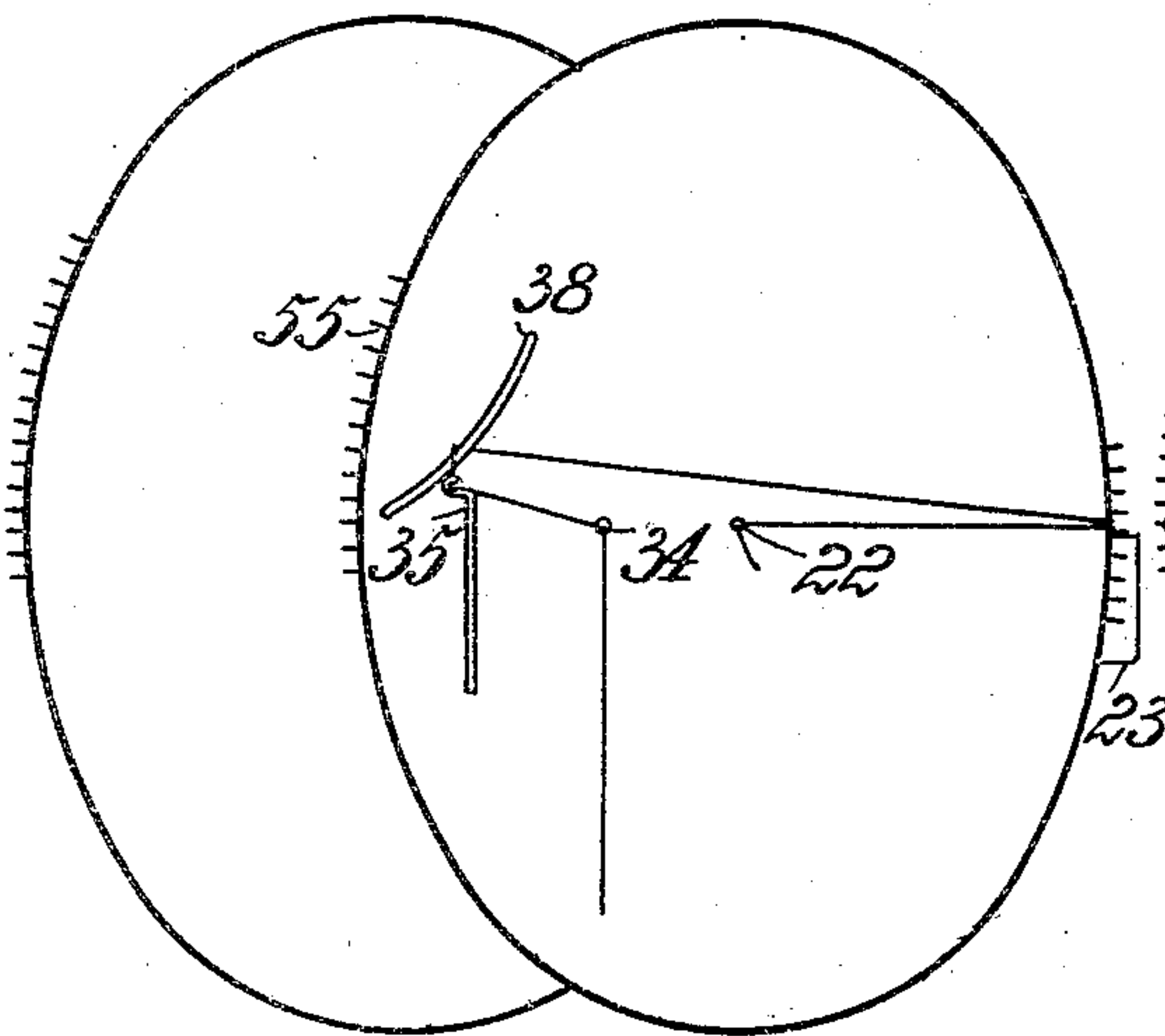
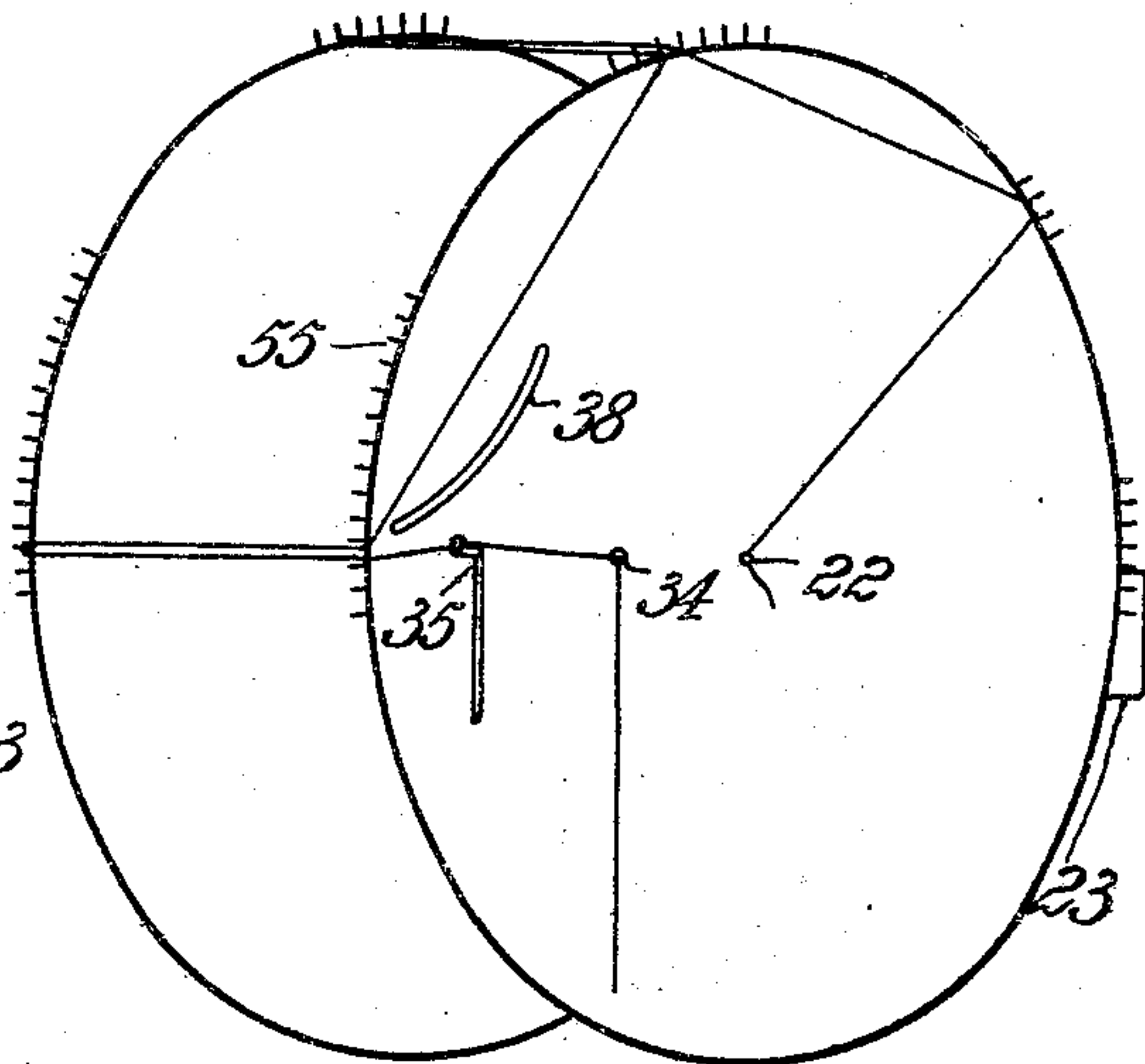


Fig. 26.



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UNITED STATES PATENT OFFICE.

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MECHANISM FOR MANUFACTURING CHENILLE STRIPS.

No. 931,365.

Specification of Letters Patent.

Patented Aug. 17, 1909.

Application filed December 31, 1906. Serial No. 350,174.

To all whom it may concern:

Be it known that I, WILHELM PAUL ZIMMERMANN, of 1 Sedanstrasse, Schöneberg, near Berlin, Germany, a subject of the German Emperor, have invented certain new and useful Improved Mechanism for Manufacturing Chenille Strips, of which the following is a specification.

Chenille used in the making of carpets, coverlets, etc. is generally either woven and then cut or is made on chenille-machines in the form of little bundles or bunches. As well as these universally known modes of manufacture, there is another process in use in which the threads forming the chenille are gathered and separated into bundles by seams sewed through them. In that process the threads, which are held by two thread-guides, are cut off at the desired width and laid parallel one to another between two sets of binding threads, stretched out and arranged one above the other. They are then fed into a sewing contrivance having any desired number of needles one alongside another, where they are seamed through and then cut into strips between the threads so that the strips of chenille thus made show an open pile on both sides.

The subject matter of the present invention consists in improved mechanism for use in the manufacture of chenille which mechanism also binds the pile threads up into bundles by means of seams. As contrasted with the mechanism hitherto used the characteristic feature of this invention lies in the auxiliary means adopted for laying the pile-threads and feeding them into the sewing device. Hitherto, special arrangements and devices have been necessary to cut off the pile-thread at a fixed width, to bring it into its exact position and then to push it between special binding threads, but by the present invention not only are a number of the stages in this work and the means for doing them rendered superfluous, but further, owing to the simplification of the operations, a more perfect form is obtained and that form is obtained with more certainty so that the threads are fed to the sewing device with a fixed width and in a continuous row. The result aimed at is attained by arranging the pile-threads in parallel layers on two parallel disks, fixed alongside one another, and having pins around their circumferences arranged like the spokes of a wheel, so that a loosely stretched

row or series of threads is obtained. To effect this, a hook or catcher leads the thread through between two pins on one disk and lays it around a pin on the other disk. The threads thus laid are fed to one or more needles, sewed, and when the laying disks are turned farther around they are cut into strips by cutting contrivances between the seams in the direction in which the row of threads runs. These strips are carried by a tension regulator to an ironing cylinder, which smooths off the ends of the threads, and they are then wound up on reels.

In the accompanying drawings:—Figures 1 and 2 show the machine in side view and front view with the thread catchers removed. Figs. 3 and 4 show the thread changing mechanism in side view and front view. Figs. 5 and 6 show a longitudinal section and an end view of the thread guide attached to the thread guide wheel, represented in Figs. 1 and 2. Fig. 5^a is a detail partly in section showing the thread hook or catcher removed. Figs. 7 to 9 show, in elevation and plan, the positions of the thread hook attached to the thread-guide, as produced by turning the ratchet wheel on the thread-guide, during the operations of taking up, carrying over and laying down the thread. Figs. 10 and 11 show the thread holder in front view and side view, but without mouthpiece. In the front view the lever springs are omitted. Figs. 12 and 13 show the double sewing device in longitudinal section and front view. Figs. 14 and 15 show the cutting mechanism in side view and front view. Fig. 16 shows a side view and an inverted plan of the steel rail on the pedestal. Fig. 17 is a plan view of the pedestal with steel rail. Fig. 18 shows the position of the striking pins on the segment. Figs. 19 and 20 show in front view and side view the bearing of the shaft for the thread holding device for holding the end of the thread. Fig. 21 and Fig. 22 show in plan view and side view the pawl and ratchet for the two laying wheels. Figs. 23, 24, 25 and 26 are diagrammatic views showing different positions of the parts with relation to the hoop and the cutting off device.

The various parts of the mechanism for tensioning and sewing the woolen threads, for cutting off the pile in single threads, as well as the whole driving gear are secured on a table 1.

The apparatus is driven from a shaft 3,

having fast and loose belt pulleys 2, the shaft being carried on the pedestals 4 and 5, each of which has three journal bearings, and also in the bearing 6. By means of beveled wheels this shaft 3 drives the two shafts 7 and 8 that are at right angles to shaft 3 and are carried in bearing 9 and 10 and 11 and 12 respectively. The revolution of the shaft 7, with the aid of a cam disk and an angle lever 50, sets in motion a thread changing contrivance 13, see Figs. 1 and 4 and by the aid of a second cam disk and a ratchet arrangement it causes a roller 14 to turn as shown in Fig. 4. By the motion of this last mentioned roller a pattern card 15, connected with the thread changing arrangement 13, is drawn off a drum 16 or respectively is led to a drum 17, which drums are set in bearings 18 and 19 secured to the table legs or supports. The revolution of the second transverse shaft 8 effects, by means of a ratchet contrivance, the turning of the two thread laying wheels 20 and 21, which are fitted with their shaft 22 in trestle bearings 118 and 119 Fig. 13 placed between the laying wheels. This ratchet device, for the two laying wheels is operated by the shaft 8 and is shown in Figs. 21 and 22. The clutch device consists of the plumber block 137, the cam 138, the forcing lever 139, the roller 140, the pawl 141, the plate spring 142, the ratchet wheel 143, the brake spring 144, the screw spindle 145 for the ratchet wheel 143, the spiral spring 146, the gear wheel 147 and a pinion wheel (not shown on the drawing) which engages with wheel 147 and which is secured to the ratchet wheel 143. The clutch device works in the following manner:—The cam 138, secured on the shaft 8 (Fig. 1) is pushed forward by turning the shaft and forcing lever 139 in the direction of the arrow 148. By this means the pawl 141 turns the ratchet wheel 143 forward one tooth thereby turning the gear wheel 147, which is fixed on the shaft 22 (Fig. 1) by means of the pinion wheel (not shown on the drawing) which is connected with the ratchet wheel 143 and at the same time the laying wheels which are placed on the shaft 22 will also be turned. After the cam 138 has passed, the spiral spring 146 returns the forcing lever 139 to its original position and so the operation continues. Further, the revolution of the shaft 8 brings into operation a cutting off contrivance 23, which cuts the sewed pile threads laid on to the wheels into strips, see Figs. 14 and 15; and it also actuates by suitable means the upper roller of a material regulating device 24. In addition to this, two eccentrics fixed on the shaft 8 put into motion the outer and the inner mechanism of two sewing devices, which are inclined to one another at about an angle of 45° and which work upon the pile that has been stretched between the laying wheels 20

and 21. These sewing devices are fitted in two brackets 25 and 26, fastened on the table 1, and are mounted by means of a tube upon the shaft 22 see Figs. 12 and 13. The main shaft 3 also drives the shaft 27, by suitable means as by transmission wheels 2', 2'' and 2''' and connecting gears 3', 3'', 3''' and 3''', see Figs. 1 and 2, the spindles of which have their bearings in the pedestals 4 and 5. The shaft 27 carries on one end the thread guide wheel 29, fitted with thread guides 28, while on the other end it has a chain wheel 30. By means of a chain, not shown, this chain wheel causes the revolution of a shaft that is not shown in Figs. 1 and 2. This omitted shaft runs parallel with the shaft 3 and is set on the table 1 where it serves as a counter shaft. By means of a cam drive this shaft, not shown in the drawing, actuates a device represented in Figs. 10 and 11 which serves to hold and catch up again the woolen threads forming the pile. The hooked mouthpiece of this device lies in front of the center of the end of the shaft 22 which is turned toward it. The cutting off contrivance 23 serves also for the severing of the thread, from the bobbin, stretched on the laying wheels 20 and 21.

The woolen threads required for making the chenille, which have been variously dyed, when the patterns were prepared, are led to eyeholes 32, placed beneath the table, from bobbins 31 standing on the floor under the table 1. From there the threads pass to the guiding eyes 33 fitted over the table 1, and from there again, they pass on to the eyeholes 34, Figs. 1 and 2, through which they are led to the needle eyes 35 of the needles in the thread changing device 13, Figs. 3 and 4. From there they are led back again over the thread changing device 13 to the mouthpiece of the thread holder, not shown in Figs. 1 and 2, but lying in front of the center of the shaft 22. See Figs. 1, 10, 11 and 23–26. In order to deal with the variously dyed woolen threads that come from the different bobbins 31, these threads are first led to the thread changing device 13, as has already been mentioned and as shown in detail in Figs. 3 and 4. This device consists of a guide-piece 37 firmly attached to a pedestal or trestle 36. The guidepiece 37 has in it a number of vertical guide holes corresponding to the number of the woolen threads to be used and toward the top it takes the form of a segment of a circle, corresponding to the radius of the thread guide wheel 29 hereafter described. Parallel to the upper edge of the guide piece 37 and at some distance therefrom is fitted a hoop 38 which is firmly united with the pedestal 36 and the guide piece 37. The guide holes admit the needles 39 which rest with their points upon the usual pattern card, this pattern card being led around the roller 14 by

means of the edge-pins 40 inserted in the edges of the card. The length of the needles is so arranged that the end 41 of each separate bent needle on the upper side reaches only to the hoop 38. The movement of the needles is controlled by a bar 43 which moves vertically up and down on a suitable upright 42 which has also vertical guide holes in it. Each needle 39 is enlarged above the lower bar 43 so that a spiral spring 44, which surrounds the needle, has its upper end bearing against the guide frame 37, and its lower end resting on the enlargement 45 of the needle 39. In this way each needle is constantly pressed against the card 15 and also against the bar 43, when it is in its highest position, as shown in the drawing. On the other hand, when the bar is lowered, any needle, which comes opposite a hole in the pattern card, can pass through the hole down into a groove 46 under the needle on the carrier roller 14 which turns forward step by step, while the other needles remain in their raised position. The eye 35 of the lowered needle then draws down the thread coming from the corresponding bobbin, which is led over the hoop 38, so that a hook of the thread guide wheel 29 coming under the bent ends 41 of the needles, in the direction of the dotted line A—B Fig. 3, can catch the thread when drawn out in a loop and carry it farther on. If the bar 43 is raised, the depressed needle will thereby be raised again, so that the card 15 can now be turned one step farther forward. The step by step movement of the carrier roller 14 and the rising and falling of the lower bar 43, are effected by two cam disks 47 and 48, fastened on the shaft 7 see Figs. 1 and 4. The cam disk 47 when rotated bears against the one end of an angle lever 50 which is fitted so that it will turn around a shaft 49, while its other end is forked and clasps on one side the bar 43 which moves up and down on the vertical bolt 42. As the arm of the angle lever resting on the cam disk 47 rises and falls under the action of a suitable spring, not shown in the drawing, the bar 43 also rises and falls. The other cam disk 48 acts on a pin 51 which is constantly pressed against the disk 48 by means of a spring 52. On the free end of this pin there is a pawl 53 which works into a ratchet wheel 54 connected with the roller 14 so that every time the pin 51 moves forward, the roller 14 will be turned one tooth farther on.

As already mentioned, the thread loop formed by the descent of a needle 39 is caught by one of the hooks of the thread guides 28, Fig. 1, which are fitted in sufficient number on the thread guide wheel 29, and is then led through between two pins on the first of the two laying wheels 20 and 21, which have pins 55 arranged around their circumferences, and which remain at rest

during this motion of the thread guide wheel 29. The loop is then laid over the opposite pin on the second laying wheel. The two laying wheels 20 and 21 then move forward over the space corresponding to two pins, so that the next thread guide 28 can take up a new loop that has meanwhile been formed by the same or by some other thread on the thread changing apparatus 13. To facilitate this taking up and laying down of the thread loop, the thread guide 28 is constructed as shown at Figs. 5 5^a and 6. It consists of a tube 58 having a thickened collar 56 which extends in a square or rectangular form some distance behind and is strengthened there by a steel facing or nose-piece 57. The tube 58 is fitted in a box 59 on the thread carrier wheel 29, in such a way that the collar 56 presses against the end 61 of the box 59, under the action of a spiral spring 63. Between the collar 56 and the end 61 of the box 59 a suitable buffer ring 60 is inserted. In the end 61 of the box 59 there is formed a suitable opening, preferably square. The spring 63 rests partly against the collar 56 and partly against a cap or cover 62 screwed on to the other end of the box. This cap has an opening in its center and the openings in the end and in the cap of the box serve to guide the tube 58 when it is moved longitudinally. The square end-guide prevents the tube from turning around. To the portion of the tube 58 which passes through the cap or cover 62 there is attached an arm 65 provided with a spring catch 64. In the tube 58 there is fitted a second tube 66 having a round head 67 which lies against the square end of the tube 58.

The thread hook or catcher 69 is chamfered at one edge to facilitate a "dipping" movement about a pivot or bolt 68, Figs. 5 and 5^a, in addition to the revolution of this hook and pivot. The "dipping" presses the square edge of the rear of the hook, adjacent to the chamfering, against the pressure stud 72* operated by the spiral spring 72, and the slight inclination of the hook thus permitted releases the yarn over the second pin of the wheel. Then the pressure stud and its spring 72 bring the hook back to erect position again by leverage upon the square corner of the rear 69* of the hook. This "dipping" of the hook with resultant compression of the spring 72 occurs when strain is brought upon the thread. The inclination of the hook assists in the release of the thread after it has been laid on the pin of the laying wheel, after which the hook returns to its erect position. On the other end of the tube 66, projecting from the end of the tube, there is a four-point ratchet wheel 70, into which the catch 64 engages, also a four-point driving star wheel 71, and when this latter is turned the tube 66 is also made to rotate, and with it the hook or catch 69. The tube

66 also takes part in any movement of the tube 58. The spiral spring 72 lies inside of the tube 66. The work of the hook, namely to catch up the thread loop formed on the thread changing appliance, to carry it over the thread laying wheels 21 and 22 and then to lay it down, is now started and performed as follows:—When the wheel 29 turns, the thread guide or carrier, after taking up the loop with its hook 69 and leading it through between two pins 55 on the first laying wheel 20, strikes with its projecting nose 57 against a small pedestal 73 (Figs. 1 and 16) which is fitted on the table 1 obliquely to the plane of the thread carrier wheel, so that as the wheel 29 continues to turn, the tube 58 and consequently also the hook 69 are forced backward against the operation of the spiral spring 63. In this way the thread that has been caught up is gradually removed so far from the circumferential plane of the laying wheels 20 and 21 that it can be carried over the opposite pin 55 on the second laying wheel 21. When the thread loop has been carried over the pin 55 in question, the end of the pedestal 73 is reached and the hook 69 is forced rapidly forward again by the action of the spring 63, being thus caused to lay the loop over the particular pin: In order that this operation may be carried out without difficulty it is necessary to separate from one another, to some extent, (Fig. 8) the two threads of the loop which lie close to one another when they were led off (Fig. 7). To effect this the hook 69 must be turned through an angle of 90 degrees. This is done by the first of four striking pins 74 (Fig. 1) which are fastened on a holder in the form of a segment of a circle 75 (Figs. 1 and 18); with the assistance of the ratchet gear 64, 70, this pin 74 causes the four-point star driving wheel 71 to turn through 90 degrees. After the hook 69 has passed by the pin 55 on the second laying wheel 21, the driving star wheel 71 strikes against the second striking pin 74 and that causes the hook to turn through a further angle of 90 degrees. The hook 69 is thus caused to assume the position shown in Fig. 9, in which it is possible for the pull on the thread to depress the hook, which can be made to dip to such an extent that the thread loop can slip off it. When it slips off the hook 69 the thread loop lays itself around the corresponding pin 55 in the second laying wheel 21. If the thread carrier wheel 29 be turned still farther the star driving wheel 71 will strike against two more striking pins 74 and thus the hook will be brought back into its original position.

The form of pedestal 73 (Fig. 1) is clearly shown in Fig. 16. The thread carrier goes with its part 57 from *a* (Figs. 16 and 17) on the steel rail 134 of pedestal 73. By beveling the rail 134 to the pedestal 73, the thread

carrier will be pressed back by rotation of the thread carrier wheel 29 (Fig. 1) until it (the thread carrier) leaves at *b* (Fig. 17) the rail 134 and will be returned to its first position, by means of its spring 63 (Fig. 5). The position of the striking pins 74 (Fig. 1) which are fastened on a holder in the form of a segment 75, are shown in Fig. 18.

It is necessary for the formation of a thread loop that both ends of the thread should be held firmly by some suitable means. For the one end this is effected by the friction of the thread in running off the bobbin, and for the other end of the thread there is a thread holder, Figs. 10 and 11. This contrivance consists of two angle levers 76 and 77, each of which is caused by the pull of a spring 78 to bring one of its arms to rest upon a cam disk 79 or 80. These cam disks are fastened on a shaft 81 which is driven by the chain wheel 30 (Figs. 1, 19 and 20). The other arm of each jointed lever is connected in each case with a catcher or take-up 82, 83, which is fixed so that it will turn on the bracket 84. One end of each of the catchers 82, 83, is provided with a catching head 85 (provided with a mouth piece not shown) the jaw 86 of which, in the course of the downward movement of the catcher, bears on the bracket 84. The catchers work in such manner that there is always one of them holding down the threads. When one of the catchers is down it does not rise again until the other catcher has reached its lowest position and consequently also presses down and holds fast the threads. 87 shows a row of threads ready to be caught by the jaw of the upper catcher 82.

The bearing of the shaft 81 (Figs. 10 and 11) and the mechanism, which is connected with it, are shown in Figs. 19 and 20. For receiving the mechanism, which is shown in Figs. 10 and 11, the shaft 81 (Figs. 19 and 20) which is supported by the bearings 135 and 136, will be guided along the side of the table 1 to the middle of the laying wheels 20 and 21. The relation of each mechanism with one another is clearly shown in Figs. 19 and 20.

For the binding of the woollen threads laid upon the laying wheels 20 and 21 and carried away from there, there are two sewing devices (Figs. 12 and 13) with the requisite number of needles. Of these the second sewing device fastens and strengthens the seam made by the first and this gives the pile threads a strong back also. The upper sewing mechanism of each of these devices is fitted above the laying wheels 20 and 21, while the under mechanism lies between them. To hold the upper mechanism in position brackets 25, 26, are suitably secured to a pedestal 88 (Figs. 12 and 13). These brackets 25, 26, are inclined to one another at about an angle of 45 degrees and on each

of them there is fitted a needle-frame 89 which slides up and down on special slides. This motion is effected by an eccentric 91 fitted on the shaft 8. The eccentric rod is
 5 connected with a shaft 94, by means of a crank 95 fitted at the side and this connection is made either directly or by means of a connecting rod 92, the shaft 94 being carried in the bearing 93 fitted on the bracket.
 10 As the eccentric oscillates the needle-frame 89 is raised or lowered by means of two cranks 96 and two connecting links 97.

In the needle-frame 89 there are fitted a number of hooked pins 99 which form the
 15 loop in the seaming thread. These pins correspond in number to the needles 98, and immediately behind the hook a hole is provided through which the thread passes. On the back end of each of the hooked pins 99
 20 there is secured a detachable disk 100 in order to make it possible to fit a spiral spring 101 on the hooked pin 99. One end of this spiral spring 101 rests upon the disk 100 while the other end rests against the
 25 projecting inside edge of the guide hole in the needle-frame 89. In this way the hooked pin 99 has always its hook pressed against the needle-frame 89. In order that the hooked pins 99 may move properly during the movement of the needle-frame, a rail
 30 or rod 102 is fixed on the heel ends of the brackets 25, 26, transversely to the ends of the pins, and in such a way that the ends of the pins 99 slide along this rod as the needle-frame 89 moves. This makes it possible for
 35 the hooks of the pins 99 either to be moved away from the needle frame 89 or to be pressed against it during the movement of the frame, according to the sectional form
 40 of the rod or rail 102. To insure proper sewing there is also fitted a presser foot 103, fastened to two tubes 105 by means of angle pieces 104. The tubes 105 slide on guide
 45 pins 106 fastened in the bracket of the needle frame 89. At their upper ends the tubes 105 have each a collar 107 and on each of these collars a spiral spring 108 surrounding the guide pin 106, exerts a downward pressure so that the tube 105, and consequently
 50 the presser-foot 103, are pressed against a stitching plate 109. This stitching plate is attached by means of uprights 110 to a pedestal 111 fitted between the laying wheels 20 and 21. In order to regulate the stroke of
 55 the presser foot 103, two set pins 112 are fitted in the needle-frame 89, and each of these has a carrier 113 catching under the collar 107 of the tube 105. On the set pin 112 there is fitted a spiral spring 114 which
 60 is sufficiently strong to lift the presser foot 103. The set pin 112 lies under the set screw 115, and when the latter is turned it can be held, along with the presser foot 103, at any desired height, against the upward
 65 motion of the needle frame 89. The under

portion of the sewing contrivance consists of a thread catcher 116 fitted with the same number of catching hooks 117 as the needle-frame 89 has needles. The catcher 116,
 70 which is fitted so that it will turn around and move along a tube 120 pushed over the spindle 22 of the laying wheels 20, 21, is held in position by bearings 118, 119, and has on it a catching piece 121, on which slides one arm
 75 of a bent lever 123, arranged to turn around a shaft 122, while the other arm of the lever can be moved to and fro by an eccentric 124 fastened on the shaft 8. The mode in which the catcher 116 moves will therefore depend
 80 principally on the shape of the catching piece 121, and the catcher 116 may consequently be made to move backward and forward, also sidewise, if a suitable form be given to the catching piece 121, and as a result of the pressure of the catcher 116 on the
 85 jointed lever 123, this pressure being exerted by means of spiral springs not shown. The sewing threads are led from bobbins suitably arranged above the brackets 25, 26, in the direction of the arrow C, and through
 90 the hooked pins 99 into the needles 98 attached to the needle-frame 89. When the upper and lower sewing devices are put in motion the simple well-known chain stitch seam is obtained which binds the threads
 95 stretched out on the laying wheels 20, 21. While in the arrangement shown a chain stitch seam is obtained other kinds of seams can be obtained if desired, by varying the construction of the sewing devices. The
 100 threads when bound or attached together by means of sewing are then led to a suitable cutting off device 23 (see Fig. 1 and Figs. 14 and 15), by turning the laying wheels 20, 21, farther forward.
 105

The cutting off device by which the loosely stretched series of threads brought along from the laying wheels can be cut into separate strips of pile, preferably consists of
 110 fixed and movable knives 125 and 126, each two of which form scissors. The fixed knives 125 are fitted alongside one another in a knife box 127, at intervals corresponding to the distances between the seams and in the space between each pair of seams. The moving
 115 knives 126 are each fastened by means of set screws to holders 128 said holders being fitted in a hollow rod or bar 130 which can be made to move to and fro by an eccentric 129 fitted on the shaft 8. Each holder 128 is
 120 secured in place in the hollow rod or bar 130 by means of a set screw 160 catching in a groove 161 in the holder the arrangement being such that the holder can turn on its axis, a spiral spring 131, fixed at one end to
 125 a support and at the other end to the holder, being coiled around the holder as seen in Figs. 14 and 15 in such manner that the moving knives 126 attached to the holder 128 are constantly pressed sidewise against the
 130

fixed knives 125. The cutting motion of the movable knives is produced by the to and fro movement of the hollow rod or bar 130, on which the knife holders 128 are fastened.

5 The separate strips of pile produced by this cutting off mechanism are then carried over a roller 132 to the material regulator 24 (Figs. 1 and 4).

10 The regulating device for the material is formed of two rollers 24 which press one against the other, and between which the pile threads are led, the pressure on the rollers holding them firmly. These rollers are so arranged that the upper one is moved forward to the same extent as the laying wheels 20 and 21 by means of a ratchet gear not shown in the drawing and which is actuated by the shaft 8 and the pile threads are thus kept under uniform tension from the laying wheels up to the regulator for the material, thereby making it possible to cut off the series of threads by means of the cutting off mechanism already described. From the regulating device the pile threads pass to an ironing cylinder 133 which is heated by steam, and is so arranged that it can be rotated at the same rate as the laying wheels 20, 21, by means of ratchet gear not shown in the drawing. The cylinder 133 has on its surface grooves into which the pile threads are pressed and in this way the pile on both sides of the seam is ironed and then the completed pile threads or chenille are led away over a roller to be wound up on reels.

35 The operation is as follows:—The woolen threads coming from the bobbins 31 are brought to the thread changing device 13. According to a certain series, fixed by means of the pattern card 15, the woolen threads lie, through the sinking of the needles 39, in the path of thread guide 28, which latter rotates in a vertical plane with the thread guide wheel 29. The thread guide catches its thread, interlaces the bow of the same through two pins of the laying wheel 20 and puts the bow around the opposite pin of laying wheel 21. After the two laying wheels 20 and 21 have turned for the distance of two pins, the next thread guide 28 comes into operation and so on, so that, on the laying wheels 20 and 21 there is a path of cross stretched threads. The thread path (so formed) goes, by the slowly suspended revolution of the laying wheels, to the first sewing mechanism (by 25). The seams run parallel in the longitudinal direction and the seams are kept equal distances from one another. The seams will be fixed by means of the second sewing mechanism (by 26). After the thread path has passed the sewing arrangement it reaches the cutting off contrivance 23, where the thread path will be cut into single strips. These strips pass between the roller 24 of the material regulating device to the steam heated ironing cylinder

133. The cylinder 133 curls the thread ends and the strips finally reach a roller, where they are wound up on reels.

The thread comes from the bobbin 31 passing through eyeholes 32, 33, 34, which effect the guiding and stretching of the thread respectively after which the thread passes into the sphere of activity of the thread guide 28, in Fig. 1, or 69 in Figs. 5 to 9 respectively, passing thereto through the needle eye 35 which is on the upper end of the reciprocating needle 39, Figs. 3 and 4. Further the thread runs over the hoop 38, Figs. 3 and 4, (in the direction of the arrow in Fig. 4) to the device at 22, which holds fast the ends of the threads or always stretches the same in consequence of its gripping action. Fig. 1 and Figs. 10 and 11. By this means the position of rest for all the threads under consideration is shown see Fig. 23. In the sphere of activity A. B. (Fig. 3) of the thread guide 28 there will be a thread if the needle 39 comes into the hole in the card-board and for this reason this one needle eye 35 will be lower than the others and consequently below the circle A. B., Fig. 3. In the position of rest the needle eyes 35 are above the thread guide circle A. B. (Fig. 3) while a sunken needle 39 stands below the same, so that the thread, going from the needle eye 35 to the hoop 38, is caught and taken along by the thread guide and indeed the thread will be held on or hung up on the pin of the laying wheel by reason of its passing between the two pins 55, Fig. 1, of the other laying wheel, thereby laying a double thread. It will be apparent that the thread which starts from the bobbin 31 is so guided that it goes from the needle eye 35 first through the space between two pins of the one laying wheel, afterward around the pin of the other laying wheel and again between the same pin space of the first laying wheel back to the catch arrangement 22 (Fig. 1) where the end of the thread may still be found (Fig. 24). Now this thread is caught and pulled through or laid up respectively by the thread guide, whenever its needle 39, and consequently, also the needle eye 35, falls in conformity with the pattern as this brings the thread in line with the path of movement of the wheel. This assumes that the laying wheel has progressed or moved forwardly a distance corresponding to the distance between two pins bringing another pin in line. If this has not occurred, another needle 39 and another portion of the thread controlled by it begin to act and the first thread, whose two strands from the laying wheel to the catch 22 and from the laying wheel to the eye 35 are now out of position, goes forward step by step with the laying wheel. That portion which goes to the eye 35 is then again laid around the hoop 38 in the course of time and is

slowly unwound from the bobbin, until the laying wheels have advanced a half rotation and until the space between the pins 55 through which the thread passes comes to the cutting off position, Figs. 1 and 25. In the meantime, the gripping movement of the catches 82 and 83, Figs. 10 and 11, of the mechanism at 22 has again caught and clamped that part of the thread, which is stretched from the laying wheel over the hoop 38, so that now the cutting off contrivance 23 may act without loosening the thread. The one part of the thread, from the laying wheel to the catch arrangement falls down as rubbish and the proper thread, which goes to the hoop 38 and through the eye 35 to the bobbin 31, is once more in its original position of rest, which means that it goes from the bobbin through the eyes over the hoop 38 to the catch arrangement 22 (Fig. 1, 86 on Fig. 11 respectively). But the process described before is only necessary if a color or a needle and its thread, do not come again into action before the laying wheels have made over a half rotation Fig. 25. But if it is the case that the same thread may be earlier worked off, which is mostly the case, so also is the cutting off of the same from the bobbin generally unnecessary. For example, if the laying wheel has rotated with the thread (Fig. 24) so far that this thread, for example, takes an inclined position from the laying wheel to the hoop 38, its eye 35 and its needle respectively being again lowered, so as to bring the thread near the thread guide, the former will be taken along and, as described, laid around the laying wheels and now the thread, which goes to the higher placed pins of the laying wheels, lie segmentally on the same (Fig. 26). The threads, which lie segmentally on the laying wheel, are rubbish and they fall down automatically when they come into the sphere of action of the cutting off contrivance 23. This action is alternatively repeated by each thread which comes from an eye 35 so that consequently the end or the beginning of the thread respectively is either guided forward by the laying wheel or held fast by the catch arrangement 22 (Fig. 1).

Having now fully described my invention what I claim and desire to secure by Letters Patent is:—

1. Mechanism for making sewed strips of chenille comprising, in combination, two parallel wheels having circumferential pins, looping means, means for catching and laying the threads in parallel rows on these wheels in order to form a continuous loosely stretched row of threads, means for rotating the wheels and means for sewing the threads together.

2. Mechanism for making sewed strips of

chenille comprising, in combination, two parallel wheels having upstanding circumferential pins, looping means, means for catching and laying the threads in parallel rows on these wheels in order to form a continuous loosely stretched row of threads, means for intermittently rotating the wheels, and means for sewing the threads together.

3. Mechanism for making sewed strips of chenille comprising, in combination, two parallel wheels having circumferential pins, means for leading each thread between two pins on the one wheel and laying it around a pin on the other wheel, means for rotating the wheels, sewing means for binding the threads together, and a cutting mechanism.

4. Mechanism for making sewed strips of chenille comprising, in combination, two parallel wheels having circumferential pins, a thread guide wheel for laying the thread upon the pins, thread guides on the wheel, means for rotating the wheels and sewing means for binding the threads together.

5. Mechanism for making sewed strips of chenille comprising, in combination, two parallel wheels having circumferential pins, a thread guide wheel for laying the thread upon the pins, thread guides therein, movable hooks on the guides, means for rotating the wheels and sewing means for binding the threads together.

6. Mechanism for making sewed strips of chenille comprising, in combination, two parallel wheels having circumferential pins, a thread guide wheel for laying the thread upon the pins arranged at right angles to the said parallel wheels, a series of thread guides on the guide wheel, hooks on the guides for catching the threads, means for turning the hooks so as to release the threads, means for rotating the wheels and sewing means for binding the threads together.

7. Mechanism for making sewed strips of chenille comprising, in combination, two parallel wheels having circumferential pins, a thread guide wheel for laying the thread upon the pins arranged at right angles to the said parallel wheels, a series of thread guides on the guide wheel, hooks on the guides for catching the threads, means for turning the hooks so as to release the threads, means for again turning the hooks to their former position, means for rotating the wheels and sewing means for binding the threads together.

8. Mechanism for making sewed strips of chenille comprising, in combination, two parallel wheels having circumferential pins, a thread guide wheel for laying the thread upon the pins arranged at right angles to the said parallel wheels, a series of thread guides on the guide wheel, hooks on the guides for catching the threads, star wheel mechanism for turning the hooks so as to release the

threads, means for rotating the wheels, sewing means for binding the threads together, and a cutting mechanism.

9. Mechanism for making sewed strips of chenille comprising, in combination, two parallel wheels having circumferential pins, a thread guide wheel for laying the thread upon the pins arranged at right angles to said parallel wheels, a series of thread guides on the guide wheel, hooks on the guides for catching the threads, star wheel mechanism for turning the hooks so as to release the threads, striking pins for actuating the star wheels, means for rotating the said guide and parallel wheels, sewing means for binding the threads together and a cutting mechanism.

10. Mechanism for making sewed strips of chenille comprising, in combination two parallel wheels having circumferential pins, a thread guide wheel for laying the thread upon the pins, thread guides therein, movable hooks on the guides, elastic means for forcing the guides forward, means for forcing the guides backward as the guide wheel revolves, means for turning the hooks, means for rotating the wheels and sewing means for binding the threads together.

11. Mechanism for making sewed strips of chenille comprising, in combination, means for selecting the threads according to a pattern, means for looping the threads, two laying wheels with circumferential pins, means for catching each looped thread and laying it between two pins on the one wheel and around a pin on the other wheel, means for rotating the wheels, means for binding the threads together and a cutting mechanism.

12. Mechanism for making sewed strips of chenille comprising, in combination, means for looping the threads, means for catching the looped threads, two parallel laying wheels, means for transferring the threads to the laying wheels and laying them one beside the other thereon, means for sewing the threads together, and means for cutting the threads into strips.

13. Mechanism for making sewed strips of chenille comprising, in combination, means for selecting the threads according to a pattern, means for looping the threads, two laying wheels with circumferential pins, means for catching each looped thread and laying it between two pins on the one wheel and around a pin on the other wheel, means for rotating the wheels intermittently, sewing mechanism, cutting mechanism, and drawing mechanism.

14. Mechanism for making sewed strips of chenille, comprising, in combination, means for supplying the threads, needles having eyes therein through which the threads are passed, means for raising the needles, means for depressing the needles,

two rotatable wheels with circumferential pins, means for catching the threads and laying them one beside the other on the pins of the said wheels, sewing means for binding the threads together and a cutting mechanism.

15. Mechanism for making sewed strips of chenille, comprising, in combination, means for supplying the chenille threads, means for looping the chenille threads, two rotatable wheels with circumferential pins thereon, means for catching the looped chenille threads and laying them one beside the other on the pins of the said wheels, a curved stitching plate, catching hooks below the plate, a series of needles above the plate supplied with sewing threads and means for operating the needles and the catching hooks so as to sew the chenille threads together and a cutting mechanism.

16. Mechanism for making sewed strips of chenille, comprising, in combination, means for supplying the chenille threads, means for looping the chenille threads, two rotatable wheels with circumferential pins thereon, means for catching the looped chenille threads and laying them one beside the other on the pins of the said wheels, means for sewing the chenille threads together, fixed cutting knives, movable cutting knives, and means for operating the movable knives so as to cut against the fixed knives with a scissors like action.

17. Mechanism for making sewed strips of chenille, comprising, in combination, means for supplying the chenille threads, means for looping the chenille threads, two rotatable wheels with circumferential pins thereon, means for catching the looped chenille threads and laying them one beside the other on the pins of the said wheels, means for sewing the chenille threads together, fixed cutting knives, movable cutting knives, spring adjustments for the movable knives, and eccentric mechanism for operating these knives.

18. Mechanism for making sewed strips of chenille, comprising, in combination, means for supplying the chenille threads, means for looping the chenille threads, two rotatable wheels with circumferential pins thereon, means for catching the looped chenille threads and laying them one beside the other on the pins of the said wheels, sewing means for binding the chenille threads together, at intervals, means for cutting the bound chenille threads into strips, and drawing rollers.

19. Mechanism for making sewed strips of chenille comprising, in combination, means for supplying the chenille threads, two catchers for holding the threads while being looped, means for operating the catchers, two rotatable wheels with circumferential pins thereon, means for catching the

looped chenille threads and laying them one beside the other on the pins of the said wheels, means for sewing the chenille threads together and means for cutting the threads into strips.

20. In mechanism of the kind described, a guide wheel, means for rotating same, a series of guides on the wheel, hooks on the guides, means for forcing the guides forward, and means for forcing them back again.

21. In mechanism of the kind described, a guide wheel, means for rotating same, a series of guides on the wheels, hooks on the guides, means for forcing the guides forward, means for forcing them back again,

and means for turning the hooks at intervals through a partial revolution.

22. In mechanism of the kind described, a guide wheel, means for rotating same, a series of guides on the wheel, hooks on the guides, means for forcing the guides forward, means for forcing them back again, a star wheel for turning each hook, catch mechanism for each hook and means for actuating the star wheels.

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

WILHELM PAUL ZIMMERMANN.

Witnesses:

WOLDEMAR HAUPT,

HENRY HASPER.