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Patented Apr. 12, 1910.

8 SHEETS—SHEET 1.

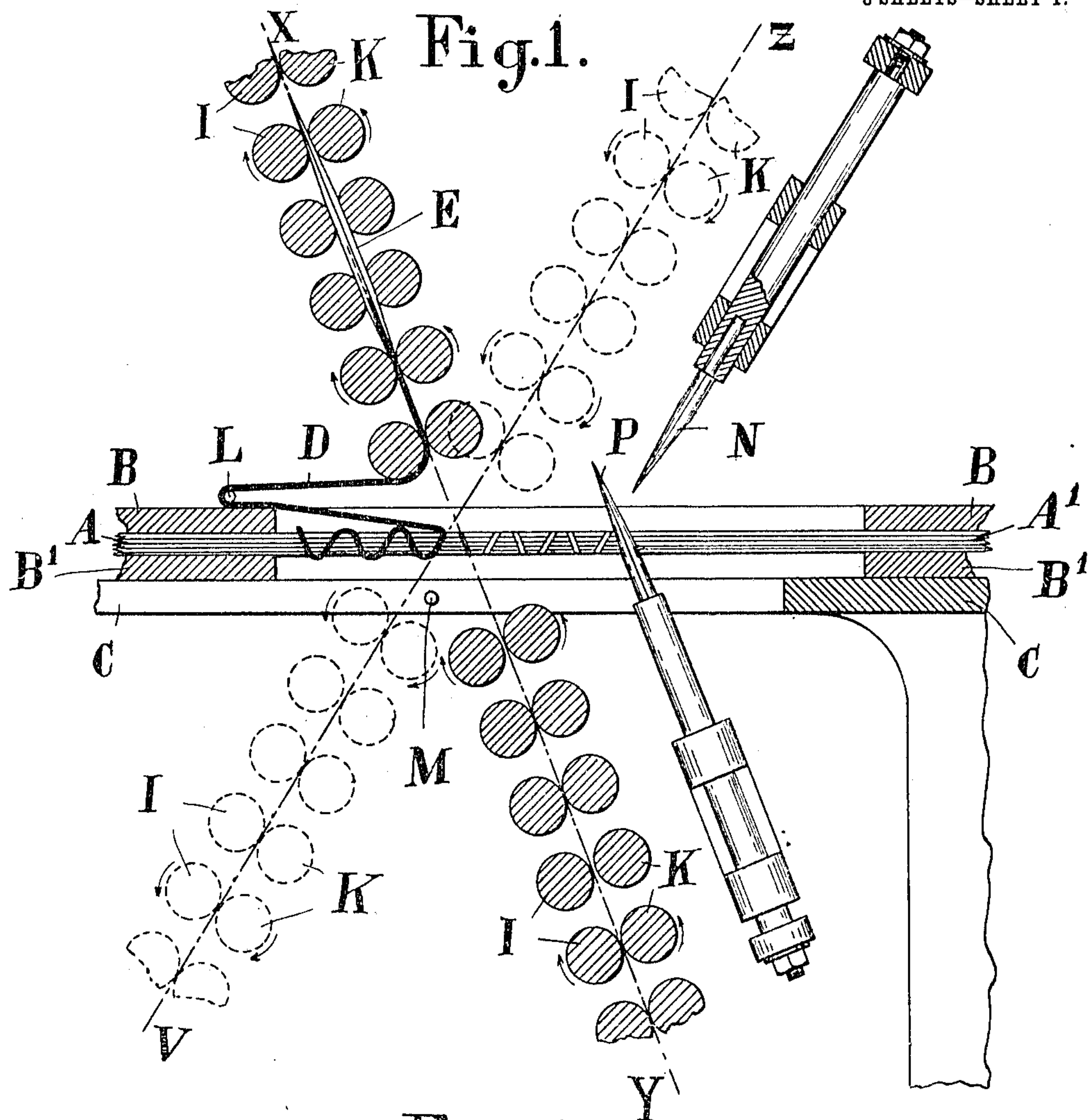
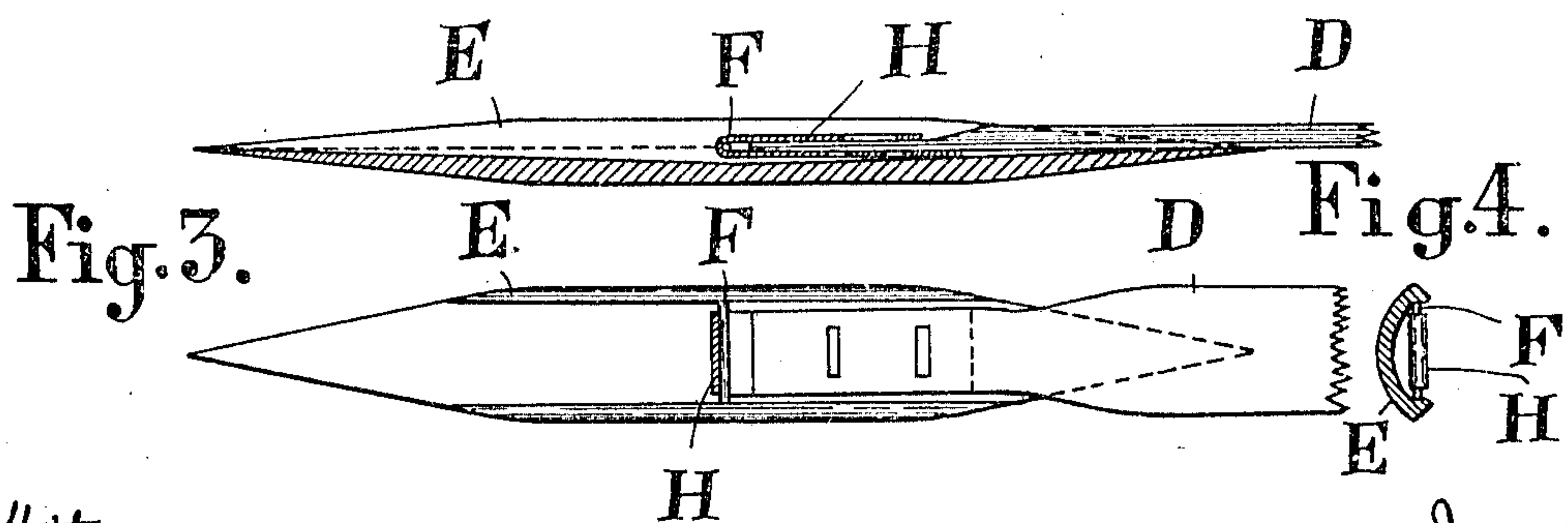


Fig. 2.



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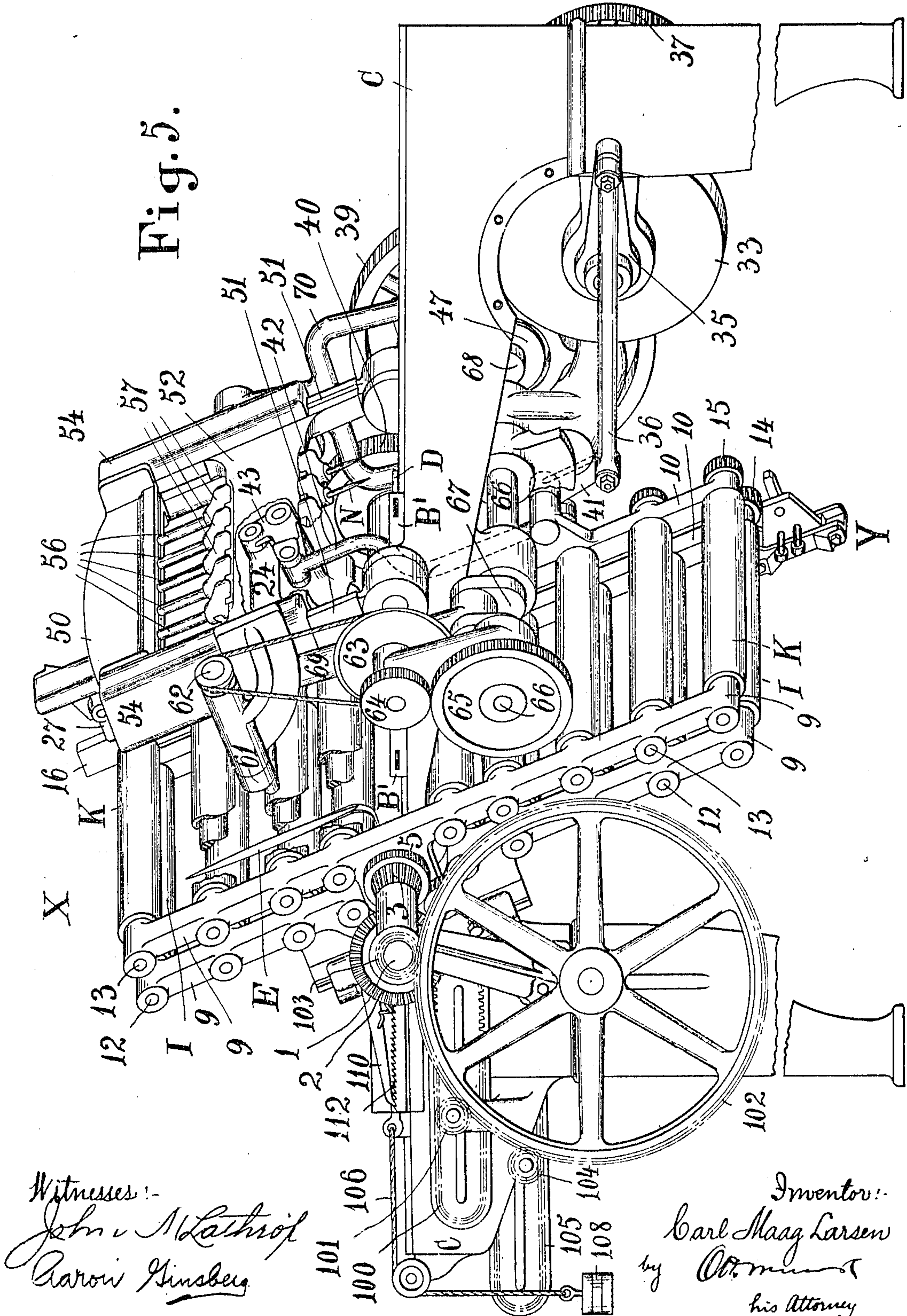
C. M. LARSEN.
SEWING MACHINE.
APPLICATION FILED AUG. 4, 1908.

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8 SHEETS—SHEET 2.

Fig. 5.



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8 SHEETS—SHEET 3.

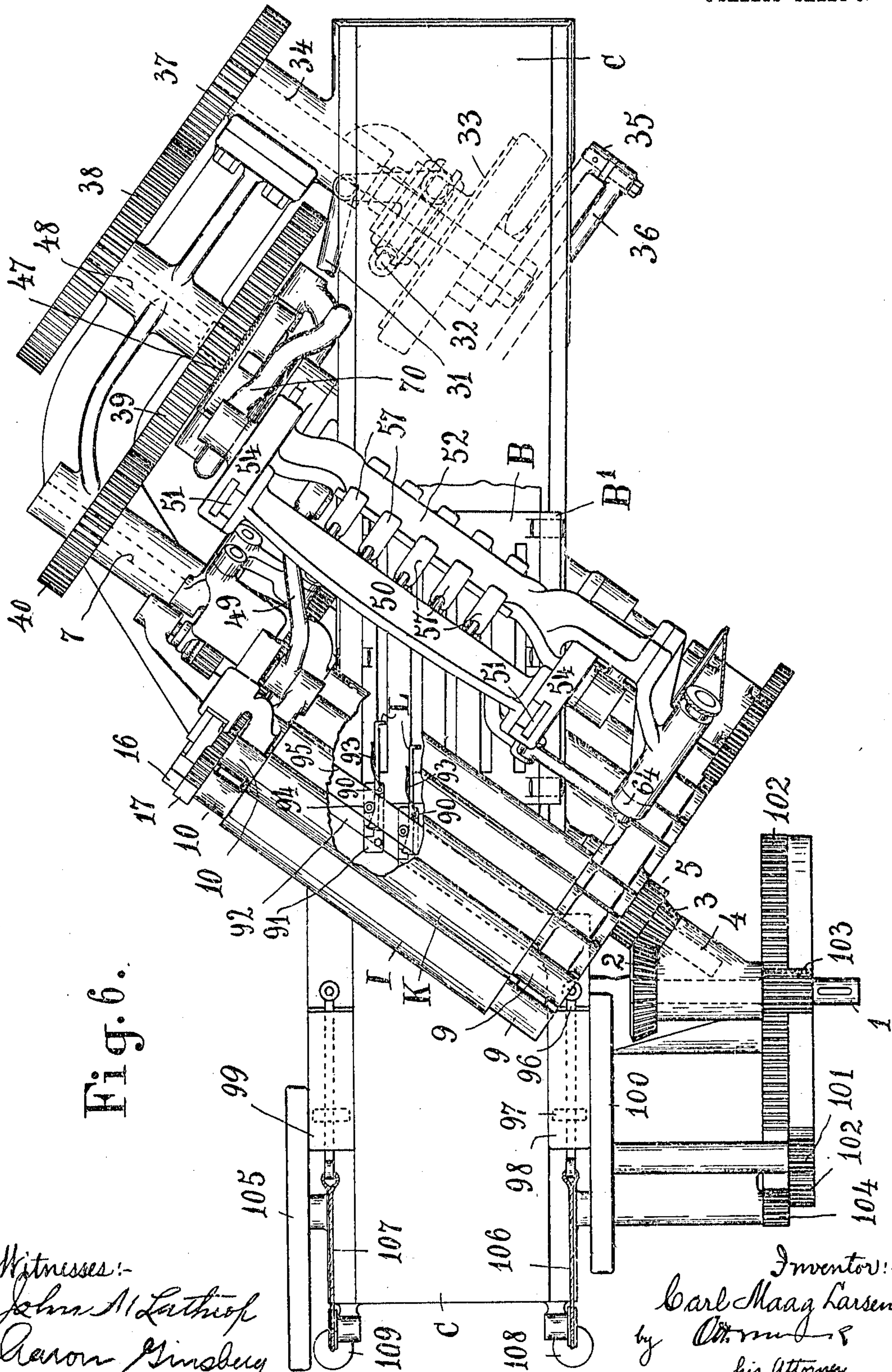


Fig. 6.

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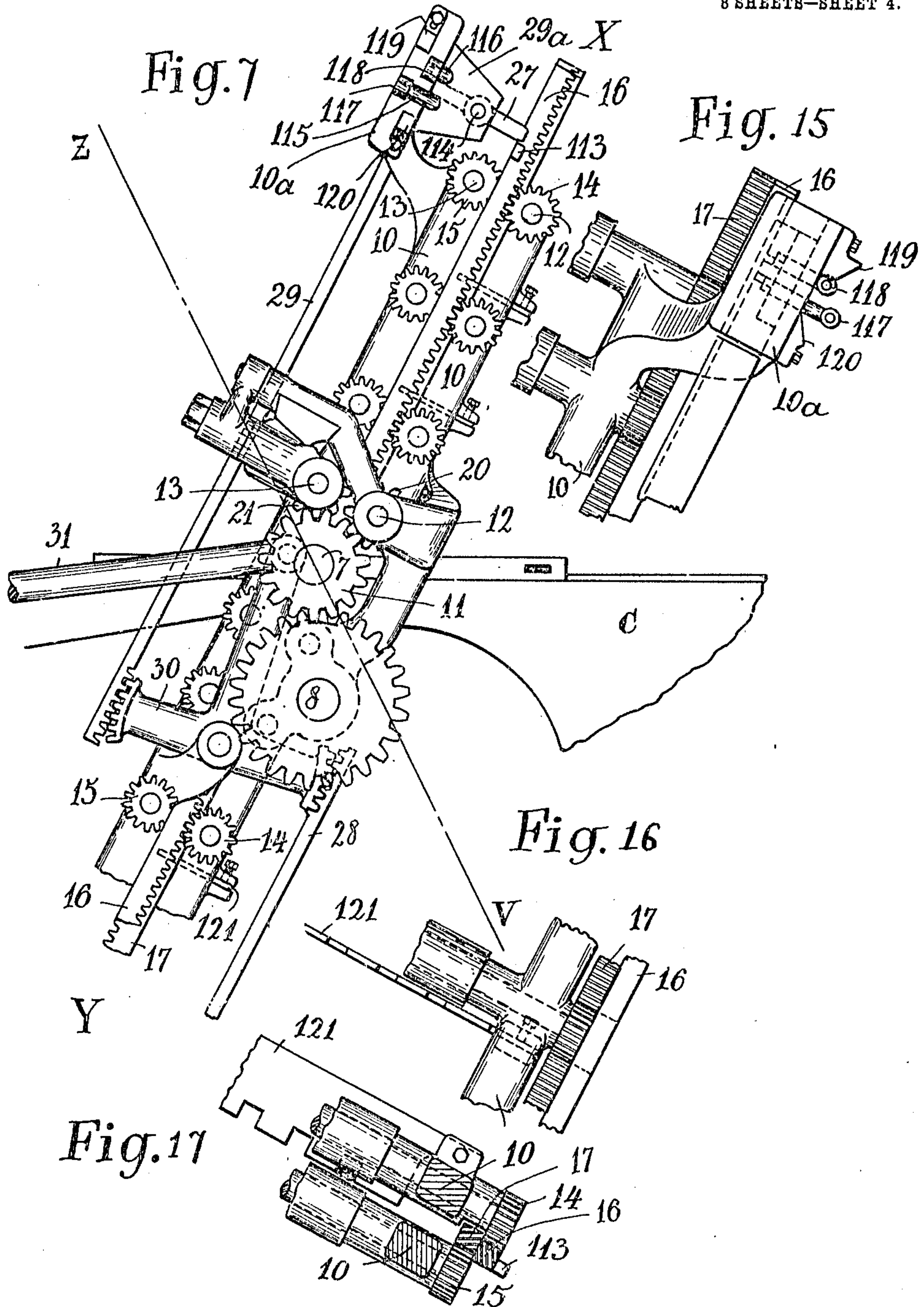
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8 SHEETS—SHEET 4.



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8 SHEETS—SHEET 6

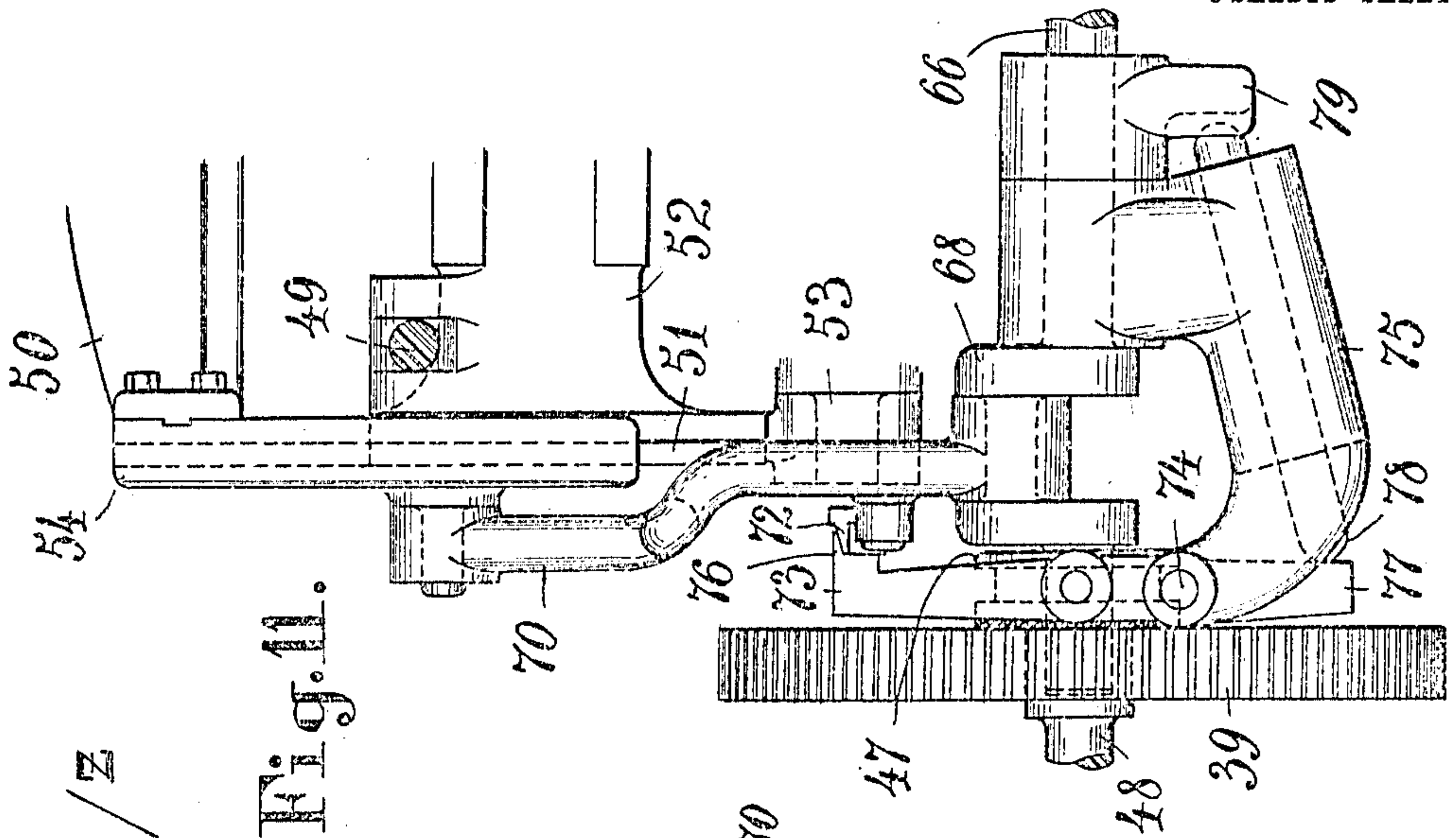


Fig. 11.

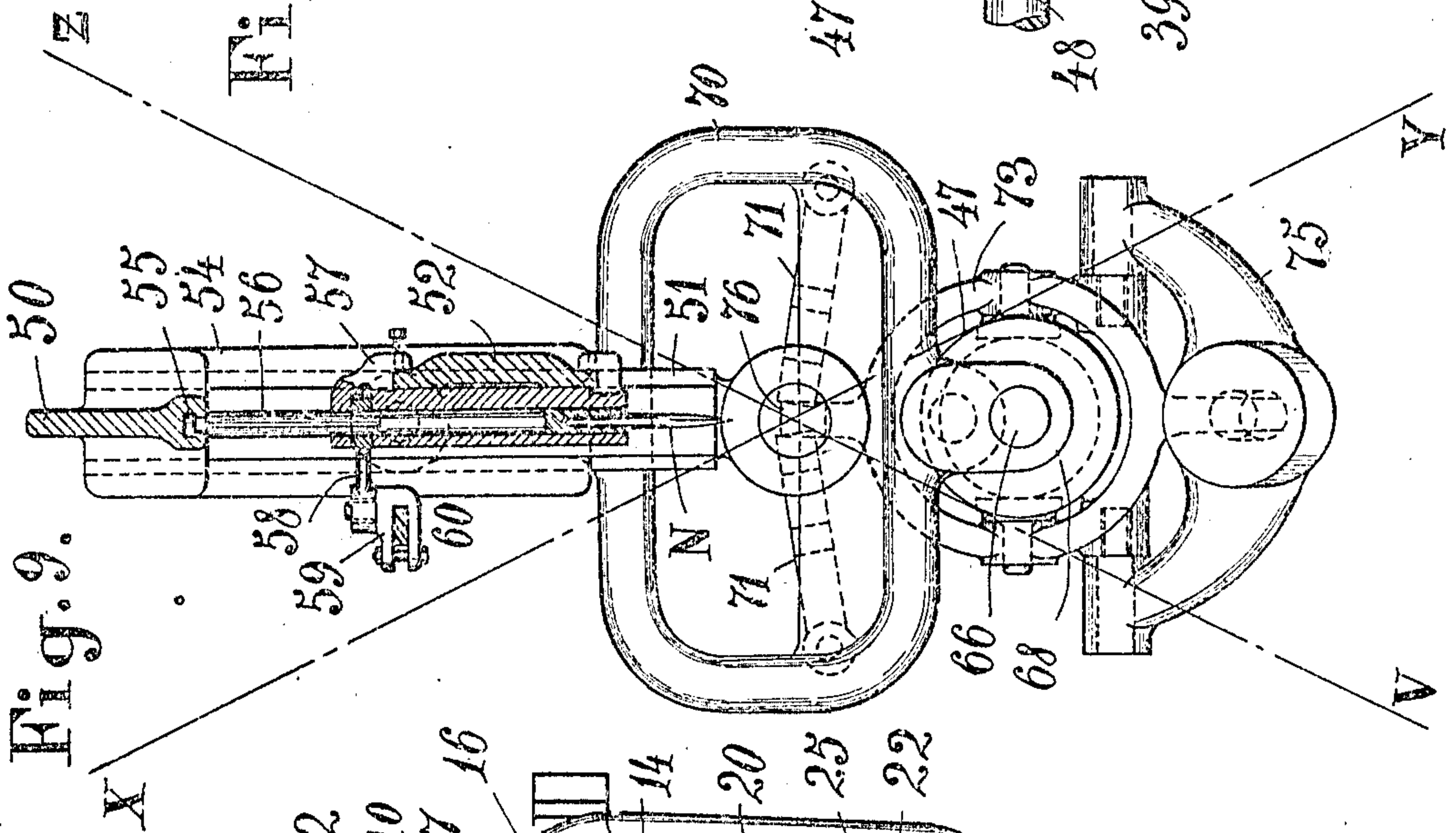
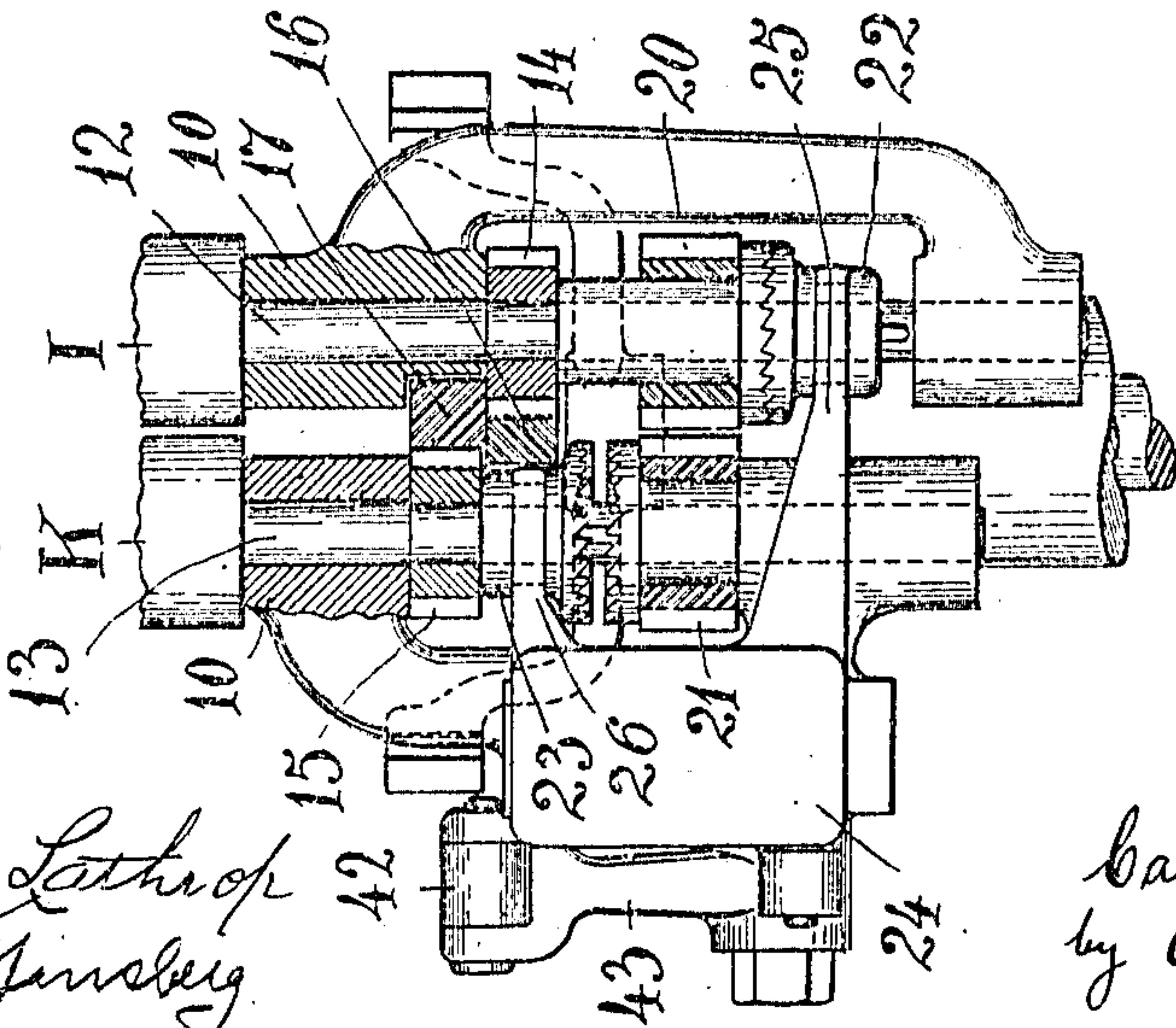


Fig. 9.

Fig. 8.



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8 SHEETS—SHEET 6.

Fig. 12.

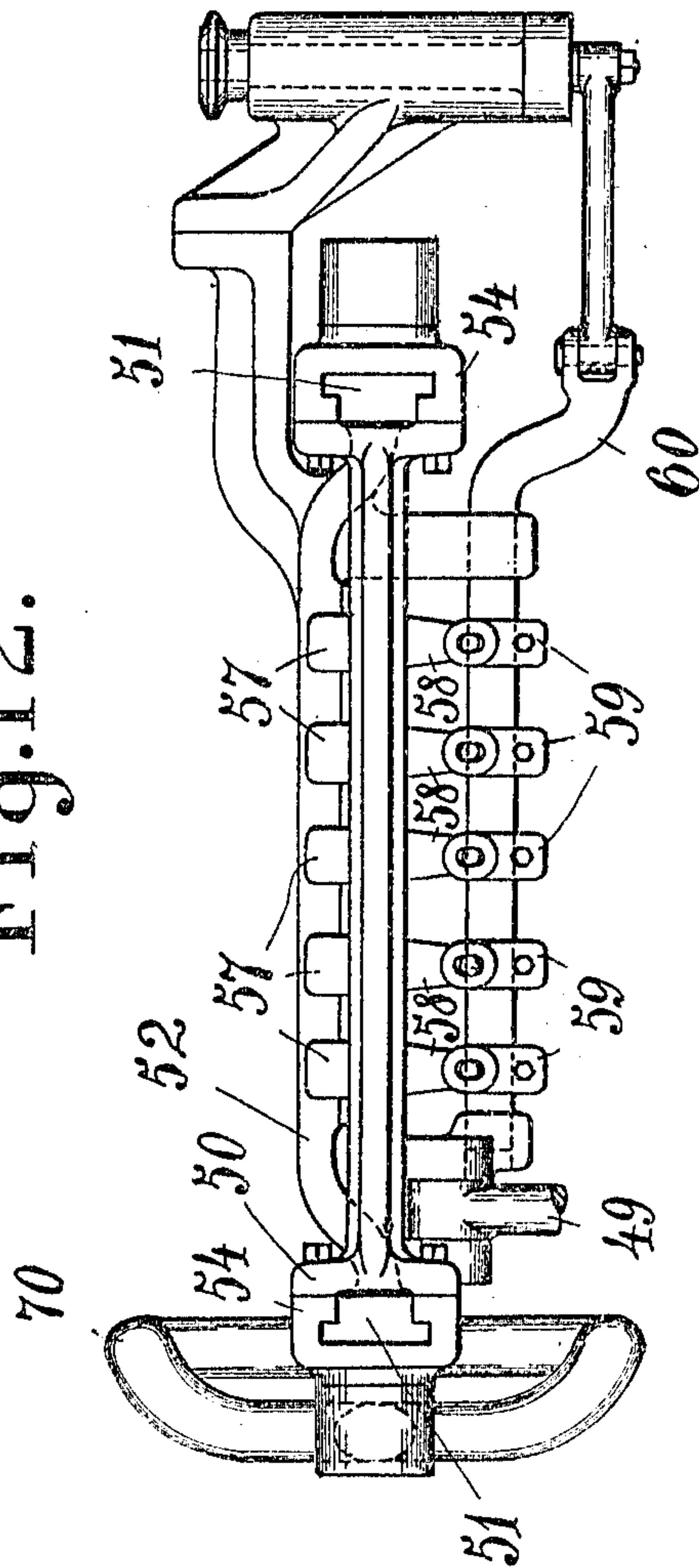
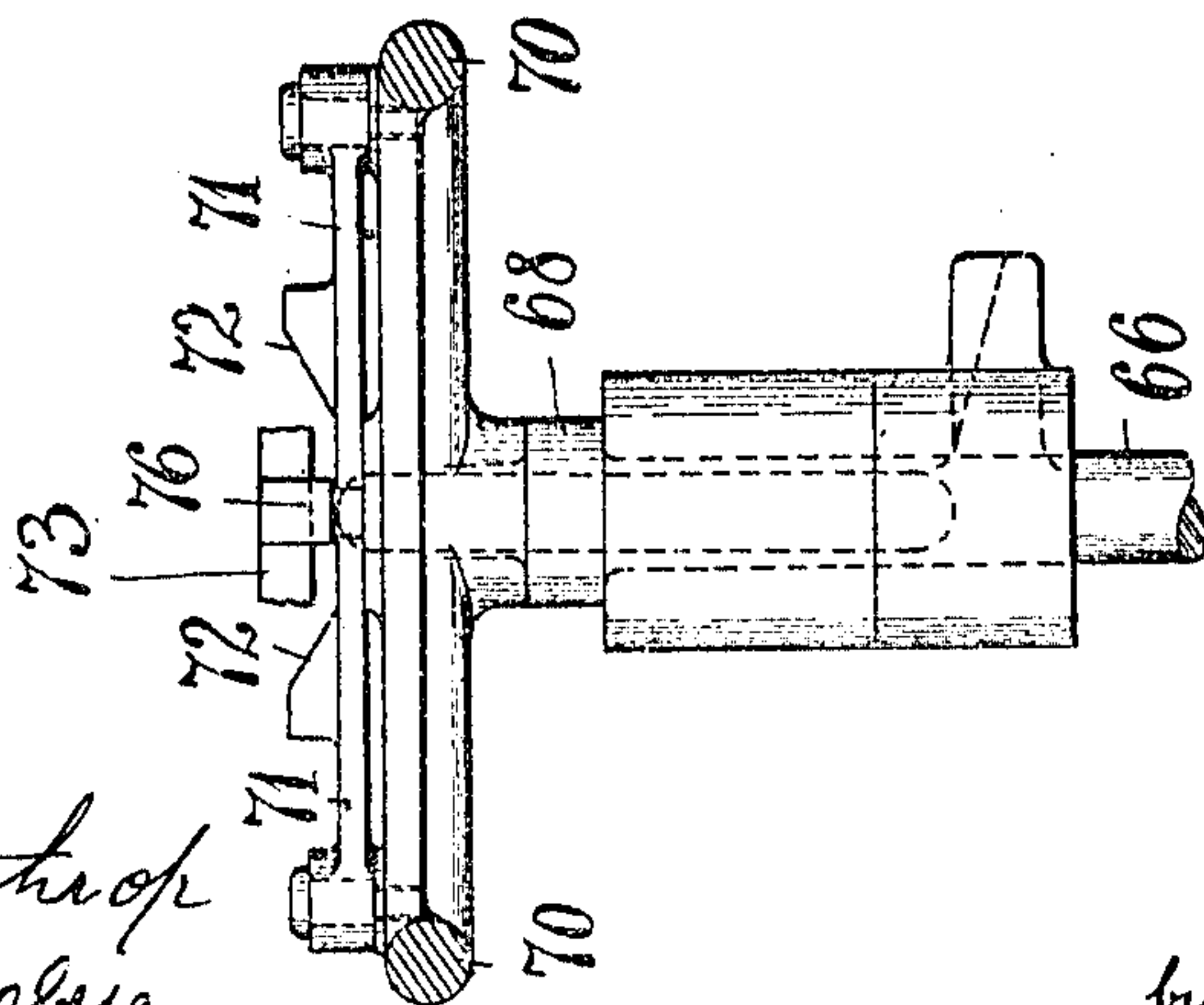


Fig. 10.



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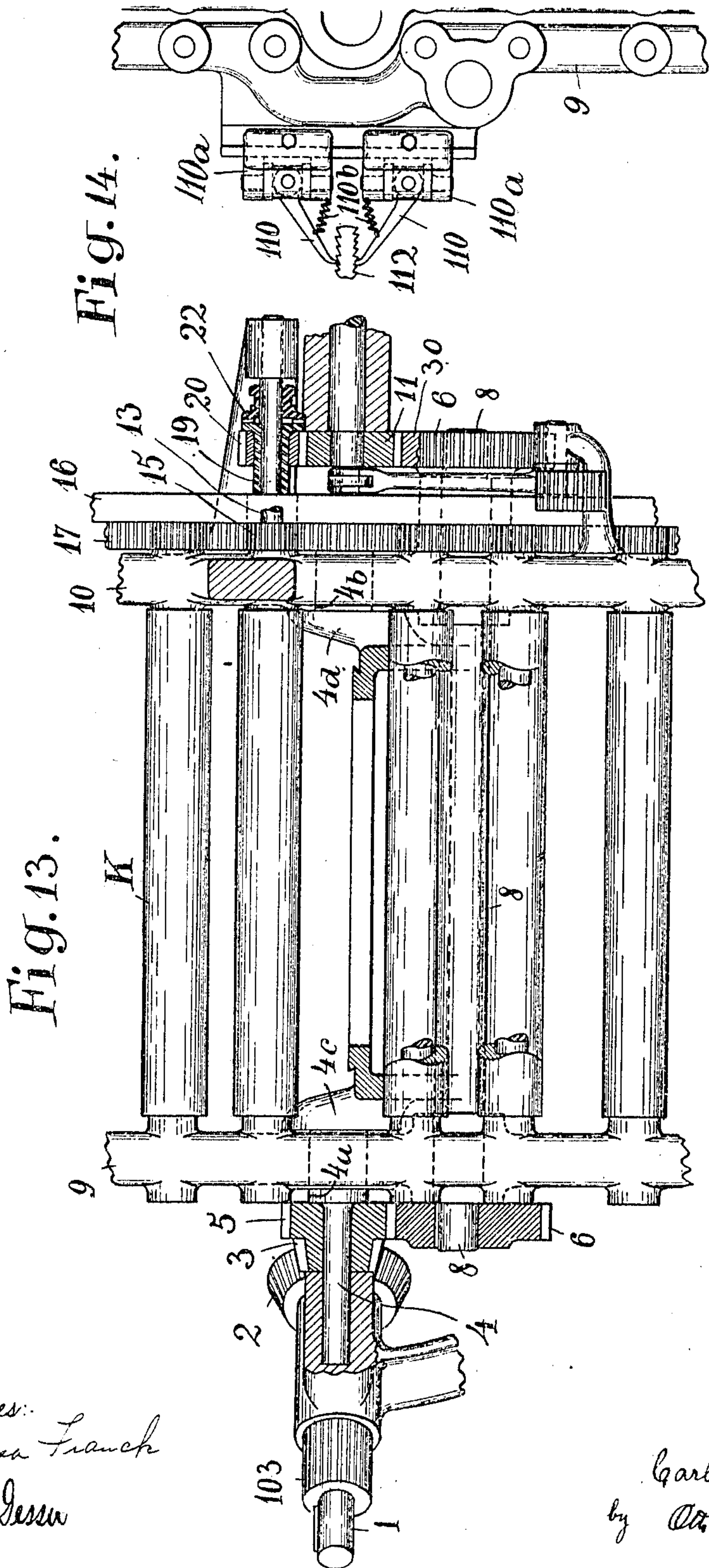
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8 SHEETS—SHEET 7.



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8 SHEETS—SHEET 8.

Fig. 18.

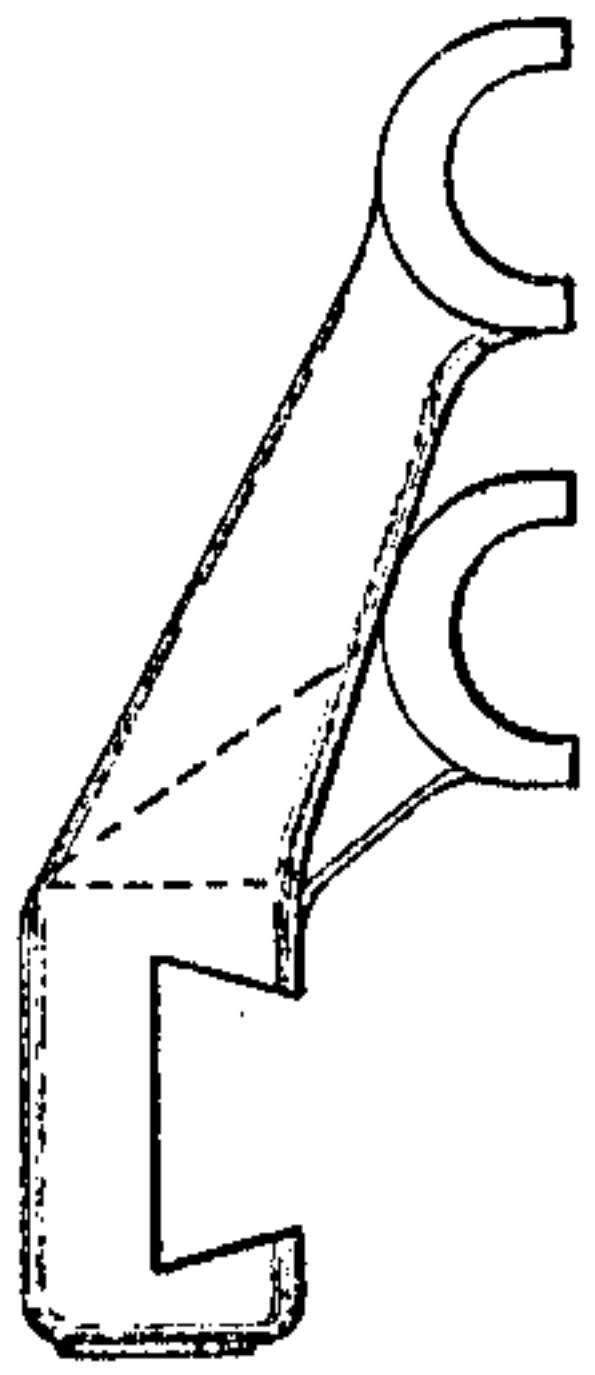


Fig. 19.

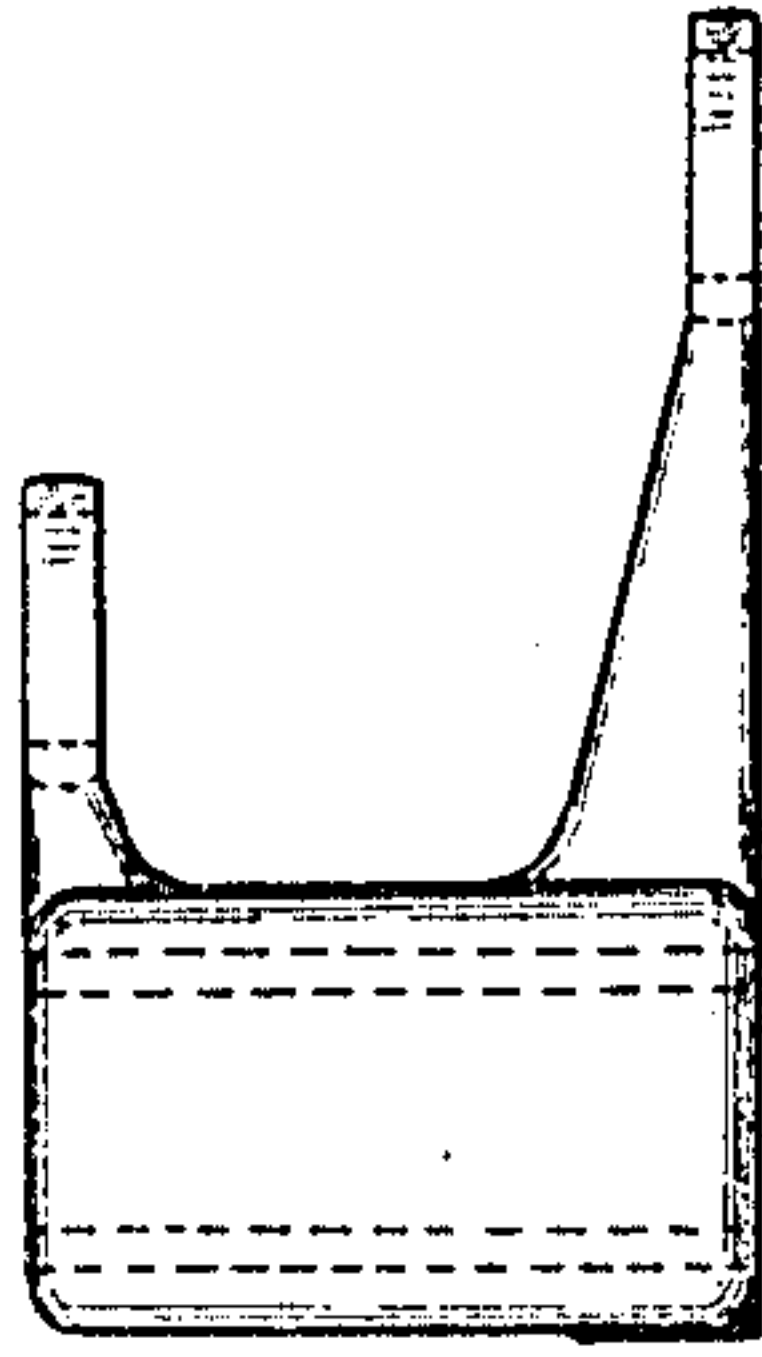


Fig. 20.

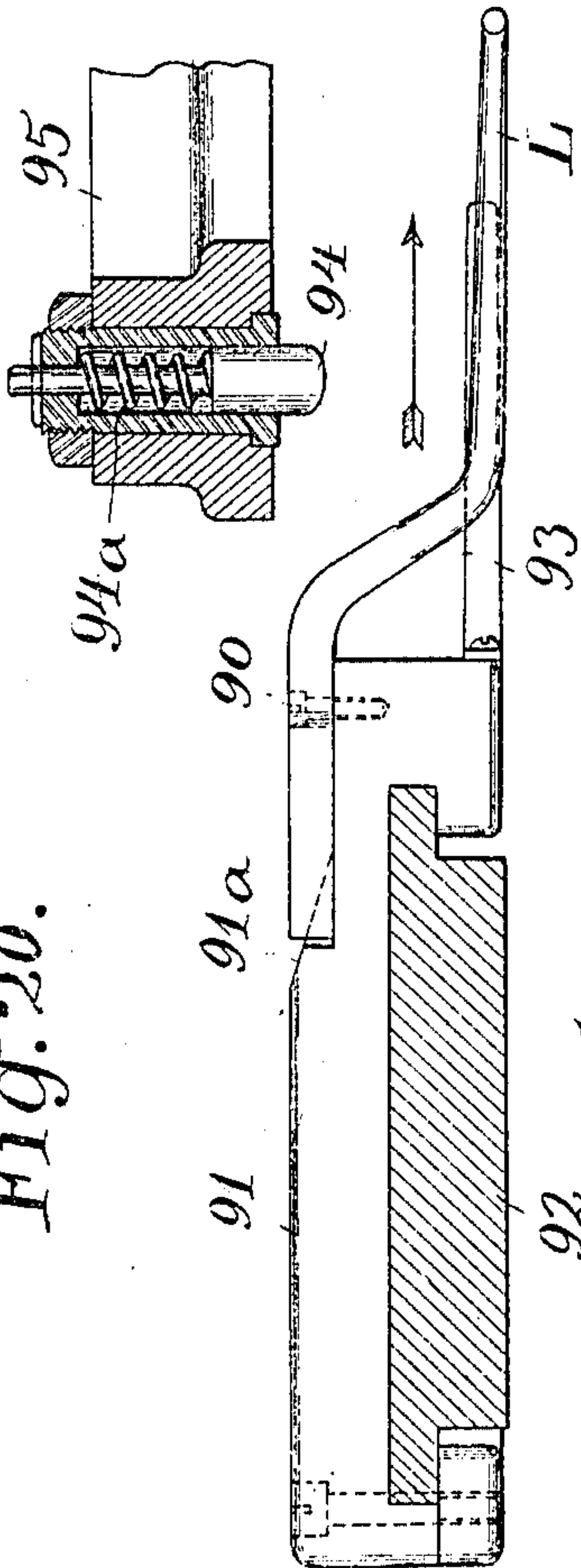
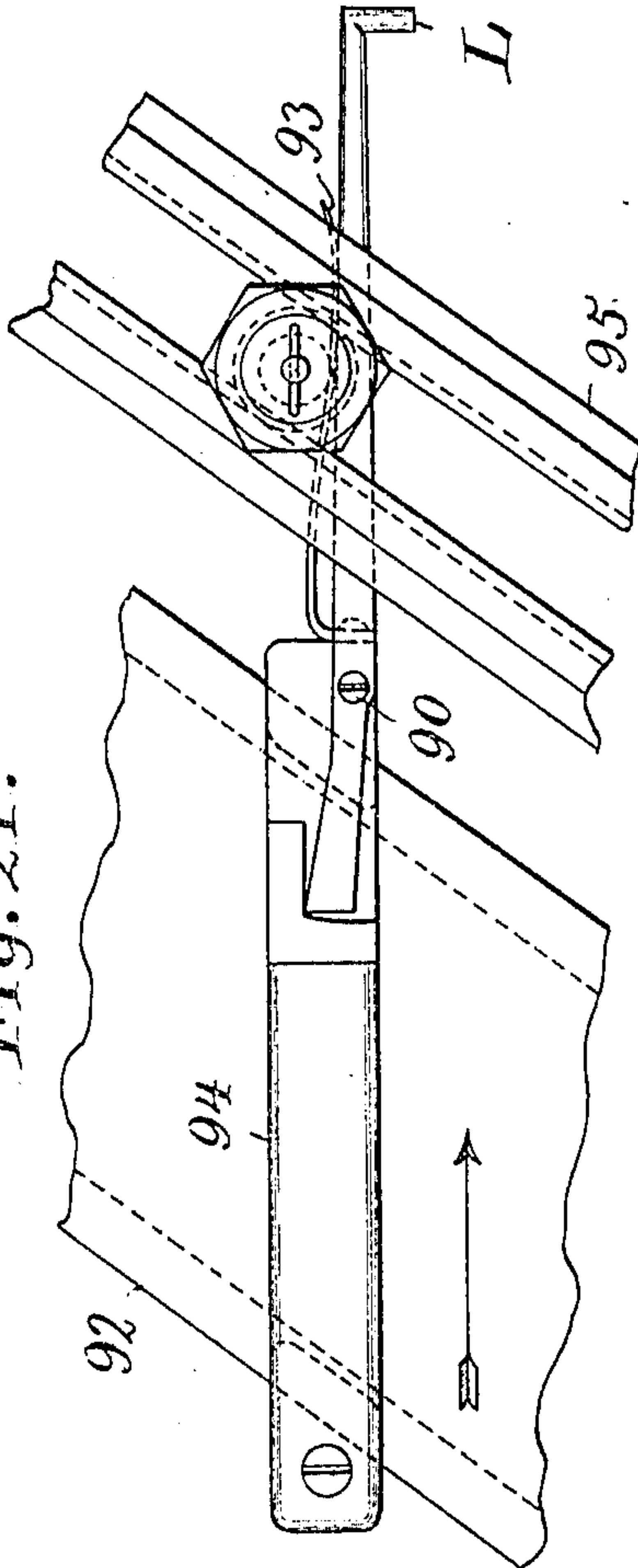


Fig. 21.



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UNITED STATES PATENT OFFICE.

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SEWING-MACHINE.

954,443.

Specification of Letters Patent. Patented Apr. 12, 1910.

Application filed August 4, 1908. Serial No. 446,949.

To all whom it may concern:

Be it known that I, CARL MAAG LARSEN, a subject of the King of Norway, residing at Christiania, Norway, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to a sewing machine especially suitable for joining gearing belts by means of narrow leather straps arranged to form stitches through the layers of leather or other material, of which the belt is made.

The invention will be easily understood from the following description reference being had to the drawings, which illustrate one form of carrying out the invention.

Figure 1 is a diagram illustrating the working principle of the machine. Fig. 2 is a longitudinal section, Fig. 3 a plan view and Fig. 4 a cross section of the needle. Fig. 5 is a side view and Fig. 6 a plan, illustrating one construction of complete machine embodying this invention, some parts of the machine being broken away to show other parts more clearly. Fig. 7 shows the upper part of a needle carrier in side elevation. Fig. 8 is a detail view showing the clutch mechanism for the driving wheels and rack bars of the needle carrier. Figs. 9 to 12 show details of the perforating mechanism, Fig. 9 being a vertical section, Fig. 10 a horizontal section, Fig. 11 a side view of one end of the perforator carrier and annexed parts; and Fig. 12 a plan of the same. Fig. 13 is a rear view of the central portion of the needle carrier showing the intermeshing pinions in section. Fig. 14 is a side view of a part of the same illustrating details of the feeding mechanism. Fig. 15 is a view of the top portion of the needle carrier. Fig. 16 is a detail showing a front view of a portion of the needle carrier and Fig. 17 is a cross section of the same detail. Figs. 18 and 19 are side and plan views respectively, of the clutch slide shown in Fig. 8. Fig. 20 and Fig. 21 are respectively side view and top view on an enlarged scale of the strap stretching mechanism.

I shall now first describe the working principle of the machine.

A and A' (Fig. 1) represent the ends of a belt which is to be joined and which ends are tapered to form a scarf joint. They are held tightly together between two plates B and B' resting on and secured to a working table C.

D represents the narrow leather strap by means of which the belt ends are stitched together. To carry out this work two sets of working tools are required viz. a perforator for making the holes and a stitching appliance or apparatus for carrying the strap through the holes in such way that a continuous seam is formed. The stitching apparatus, being the most important part of the invention, will first be described.

Fig. 1 shows the strap D after four stitches have been formed with it; it runs from the last stitch made about horizontally backwardly to a small stretching roller L which is capable of making a movement toward and from the stitch during the movement of the sewing needle, for the purpose of holding the sewing strap stretched. From the stretching roller the strap passes forward and is passed between two sets of rollers I K, the needle rollers, up to the needle E, Figs. 2, 3 and 4, to which it is fixed about the middle portion thereof by means of a small plate or shoe H, which is hinged transversely to the needle by means of a pin F. The needle itself may preferably have a fish-shaped configuration as shown in Figs. 2 and 3 and in cross section it may be as shown in Fig. 4. The rollers I and K are of a material capable of holding the needle by friction, for instance india rubber. There are a set of rollers I and K on each side of the work table C and they are preferably mounted in bearings in a common swinging frame the fulcrum of which is a little above the table. The rollers at each side of the needle are all rotated in the same direction so as to cause the needle to be pushed down through the previously made hole in the belt in an inclined direction; when the needle comes through on the other side it will be caught by the rollers on that side and these will pull it farther until the stitch is completed. When the needle goes down the stretching roller L is simultaneously caused to move to the left to hold the strap stretched; and when the middle of the needle with the strap fixed thereto has passed the lowermost of

the upper set of rollers the hinged shoe H will turn upon its pin, so that when the needle continues its movement the strap will lie along the upper half of the needle. The stretching roller L then moves to the right until it has passed the working line of the needle and the stitch is now completed in that the needle tightens the strap, whereupon the needle-rollers come to rest. The frame carrying the needle-rollers then swings so that the rollers occupy the positions indicated in dotted lines, whereupon the rollers are set in motion in the opposite direction and thereby push the needle up through the next hole, the belt having in the meantime been fed the length of a stitch to the left. The stretching roller M then performs the same function below the belt as the roller L did above the belt. In this manner the work is continued till the seam is completed.

For making the stitch holes there are employed pointed perforators N, P, one above and one below the table. They are inclined at an angle corresponding to that at which the needle is arranged to work. Instead of having two perforators as shown there may be only one perforator mounted to swing like the needle roller frames.

The mechanism for moving the several parts is so constructed that the whole machine works automatically for which purpose suitable gearing and cam wheels may be employed as well understood.

In the following I shall describe the complete machine as shown in Figs. 5-12. For the sake of clearness the description of the machine is divided up under the following headings:

I. The machine frame and the main gearing mounted upon the same.

II. The needle carrier and the devices adapted to move the needles up and down and to swing the carrier to and fro about its pivot.

III. The perforator carrier and the devices adapted to actuate the perforators.

IV. The stretching devices for the sewing straps.

V. The mechanism for feeding the belt forward.

In the drawings of the complete machine the main parts of the machine are indicated with the same reference characters as those used in the diagram Fig. 1 for indicating corresponding parts.

In order that the rows of stitches shall extend at an angle to the axis of the belt the axes about which the needle carrier and the perforator swing is placed at an angle relatively to the machine frame as shown. The perforators are not arranged as in the diagram, *i. e.* in two sets, one above and one below the table, but there is only one set and that is arranged above the table, the per-

forator carrier being adapted to swing in a similar manner to the needle carrier, the two carriers being connected together by a link.

I. The machine frame and the main gearing. (Figs. 5 and 6.)—The main driving axle 1 carries a belt driving wheel, not shown, on its outer end, and at its inner end it is furnished with a bevel pinion 2 adapted to mesh with a similar bevel pinion 3 which is formed in one piece with a pinion 5. The pinions 3 and 5 are mounted to rotate freely on a pin 4 which is an axial extension of a pin 4^a forming the fulcrum on which the needle carrier swings. The pin 4^a and a similar pin 4^b on the other side of the needle carrier project from hubs 4^c and 4^d on the machine frame (Fig. 13) and these pins bear in the needle carrier bars 9 and 10. The pinion 5 meshes into a pinion 6, Fig. 5, on an auxiliary shaft 8 passing behind the needle carrier across the machine and journaled in bearings in the said carrier as clearly shown in Fig. 7. At the other side of the machine the shaft 8 is in gear with a shaft 7 which is located in axial line with the fulcrum pin 4. The shaft 7 drives all the mechanisms connected with the needle carrier and perforators, this driving being effected in part indirectly from the shaft 7 and in part from the shafts 48 and 34 which are in gear with the shaft 7 through two pairs of gear wheels 39-40 and 37-38.

II. The needle carrier and devices corresponding thereto. (Figs. 5, 6, 7, 8.)—The needle carrier consists of a swinging frame composed of two pairs of parallel bars 9 and 10, one pair on each side of the machine; as mentioned the fulcrum of this carrier is formed by the pin 4 on one side and a similar pin on the other side. In the bars 9 and 10 are formed bearings for the needle rollers I, K the axles 12 and 13 of which on one side project outside the bars and carry pinions 14 and 15 by means of which they are rotated by two traveling racks 16 and 17, Figs. 7 and 8, which are secured to each other. On the shaft 7 is keyed a pinion 11 that gears into two pinions 20 and 21 mounted to freely rotate on the extended ends of two of the roller axles 12 and 13. The pinions 20 and 21 each form one part of two clutches the other axially movable parts 22, 23 of which are mounted to rotate with the axles 12 and 13 and are controlled by a sliding piece 24 having forked arms 25, 26 entering annular grooves in the clutch parts 22 and 23, as clearly shown in Fig. 8.

When the parts are in the positions shown in Fig. 8, it will be seen that the pinion 20 is clutched to its shaft 12 and that the pinion 21 is free to rotate on its axle 13. The axle 12 will then be rotated by the rotation of the pinion 20, while the pinion 21 will turn freely on the axle 13 and the latter will therefore be free to move, and will ro-

tate, being driven by the pinions 15 meshing with the rack bar 17. As the rack bars are secured together and are in engagement with the pinions 14 and the pinions 15 respectively, which are all keyed to the axles 12 and 13 respectively, all the rollers will be positively driven, the pinion 20 driving them in one direction and the pinion 21 in the other direction. The two rack bars will travel up and down like the needles.

When the rack is approaching its uppermost position and its direction of motion should be reversed a projection 113 on the same hits one end of a lever 27, which is hung on a pinion 114, mounted on a bracket 29^a on the rod 29; the lever 27 is arrested in the position shown by two longitudinally movable pins 115, 116, which are bent at right angles and provided with rollers 117, 118, at their free ends. In the path respectively of the roller 117 and the roller 118 are mounted inclines 119 and 120 on a bracket 10^a projecting from the frame 10. When the projection 113 on the rack 16 hits the lever 27, the latter will (being prevented from turning on its pinion 114) cause the rod 29 to be taken along in the upward movement of the rack 16, until the roller 117 on the pin 115 hits the incline 119, when the latter will cause the pin 115 to be pulled outwardly so that it loosens its hold on the other end of the lever 27. The latter is then free to turn on its pivot, the rod 29 will come to rest and the rack 16 will continue its movement a short time until it is caused to stop as below described. The rod 29 extends along-side the needle carrier and terminates in a small rack that engages a rack segment 30.

An arm formed in one with the rack segment 30 is connected through a rod 31 with a bell crank lever 32, Fig. 6, which engages the sliding part of a friction clutch 33 on the shaft 34. When this clutch is in engagement a crank arm 35 fixed to the other part of the clutch will be set in motion and move the rod 36, which will first move a bell crank 41, Fig. 5, and, through a connecting rod 42 will also move a bell crank 43, the latter, which is shown in Fig. 5 as well as in Fig. 8, has its upwardly extending arm directly connected with the sliding piece 24 which, as before described, serves to move the two clutch parts 22 and 23. It will therefore be seen that when the rack 16 causes the rod 29 to turn the rack segment 30, the rotation of the rollers will first cease for a moment and they will then be caused to move in the opposite direction, the pinion 21 being positively driven while the pinion 20 runs loose. By the continued movement of the rod 36, Fig. 5, the whole needle carrier will be caused to swing from the position Z—V, Fig. 7, to the position X—Y.

When the pinions 14 and 15 commence ro-

tating in the opposite direction and the rack bars 16 and 17 are moving downward from X to Y the projection 113, which has as just described shifted over on the top side of the lever 27, will carry with it downward the rod 29 until the roller 118 hits the incline 120 and the pin 116 is thereby pulled out, so that the lever 27 is allowed to turn on its pivot, whereupon the rack bar 16 continues its movement until the position Y, while the rod 29 stops after having carried the whole train of rods, levers and wheels 29, 30, 31, 32, 33 back to their normal position, whereby the rod 36 and crank arm 35 will come to rest after having moved about 180°.

In order to guide the needles and to prevent them moving out of the direct way down to the previously made holes in the belt, bars of wood or iron are provided which enter between the rollers. These bars are not shown in the drawings.

III. Perforator mechanism.—The perforators are mounted in a swinging frame composed of two side pieces 51 united by a yoke 52 and arranged to turn on pins 53, Figs. 5, 6, 9, 10, 11 and 12. By means of a rod 49, Fig. 6, this frame is coupled to the needle carrier so that both devices will always be parallel. The side pieces 51 form guides for slides 54 which are at their upper ends united by means of a yoke 50 and which form the carrier for the perforators. The perforators consist of the perforators proper, Fig. 9, and holders or spindles 56 which are each provided with a head 55 inserted in a T-shaped groove in the yoke 50. The spindles 56 are guided in pieces 57 secured to the yoke 52 by means of lugs and a set screw as shown, whereby the distance between the perforators may be regulated.

For moving the perforator slide up and down there is provided on each side a driving rod 69, 70 coupled to the slide by means of pins and to a shaft 66 by means of cranks 67 and 68. See Figs. 5 and 11. The connecting rod 70, as shown in Figs. 5 and 9 is a somewhat peculiar shape being provided with a frame-like enlargement in order to provide room for two arms 71 having tapering lugs 72. These arms serve to automatically connect the before mentioned shaft 66 with the constantly rotating shaft 48, Fig. 11, at the moment the perforator frame swings from one position to the other. On the end of the shaft 66 is fitted an axially movable clutch part 47 corresponding with a clutch part fixed to the end of the shaft 48 or rather on the toothed wheel 39 on the end of this shaft. The clutch part 47 is controlled by a lever 73, which has its fulcrum at 74 on a two armed bracket 75 projecting from the frame. The upper end of the controlling lever 73 is formed with a lateral lug 76 that enters the path of the tapering lugs 72 on the arms 71. The lower end 77 of the

controlling lever 73 is in contact with a sliding bolt 78 that rests loosely within an inclined bearing in the bracket 75. Coöperating with the upper end of this sliding bolt is a cam 79 mounted on the shaft 66.

When the perforator frame swings from one position to the other, one of the lugs 72 will hit the lug 76 on the clutch controlling lever 73 and press the latter outwardly thereby placing the clutch in engagement, the shaft 66 will thereby be caused to rotate with the shaft 48, making one revolution and causing the perforators to produce the desired holes. Toward the end of the revolution the cam 79 will hit the sliding bolt 78 and the latter will press on the lower end of the controlling lever 73 and cause it to return to its normal position thereby disengaging the clutch.

In order that the perforators shall make a clear cut through the belt, they should have a small vibrating or rocking motion. This is attained by means of small arms 58, Figs. 9 and 11, fitted into the guide pieces 57 on the spindles 56, so that the spindles may move freely up and down but partake in the rocking motion of the arms. The arms 58 are connected by means of clamps 59 to a rod 60 which through another rod is connected to a small crank shaft 61, Fig. 5, driven by a belt wheel 62 and belt from a wheel 63, which is placed on an axle that carries a pinion 64 driven by a pinion 65 on the before mentioned axle 66.

IV. Strap stretching mechanism.—The mechanism for moving the strap stretchers L and M Fig. 1 will be understood from Figs. 5 and 6. The strap stretchers L are formed as hooked levers fulcrumed at 90 on small pieces 91 fixed to a cross bar 92 secured on both sides of the machine to stretcher rods. The hooked levers are acted upon by springs 93 which hold the rear end of the levers in contact with a pin 94 fixed to the under side of a cross bar 95 on the machine frame a short distance above the working table, and as the rear ends of the levers are cam shaped, when the stretchers are moving forward in advance of the position shown in Fig. 6, the hooks will be pressed to the side and the straps released from the hooks. The pin 94 is vertically movable and kept in its lowermost position by means of a spring 94^a. When passing the rear end of the strap stretcher, causing it to turn upon its pivot 90, the pin hits wedge face 91^a and is thereby lifted above the stretcher L, so that upon the return movement the pin 94 may pass above the same and leave it at rest.

The cross bar 92, which carries the stretcher hooks, is secured to a stretcher rod 96 on each side of the machine. These rods 96 are furnished with pistons 97 arranged to work in cylinders 98 and 99 respectively one

on each side of the table. The cylinders are connected with each other by lateral braces, not shown; and the cylinder 98 is secured to an endless rack bar 100 the teeth of which gear into a pinion on a shaft having a pinion 101 gearing in its turn with one half of the teeth of the large tooth wheel 102. The latter is constantly rotated by means of the pinion 103 on the main axle 1. The wheel 102 has two rows of teeth, extending each over one half of the periphery and being set off laterally against each other, so that while the pinion 103, which is wide enough to cover both rows of teeth, will cause the wheel 102 to rotate continually, the latter will cause the pinion 101 to rotate only during one half of its rotation; during the other half of its rotation the pinion 104 meshing with the other row of teeth on the wheel 102 will be rotated, this pinion co-operating in its turn with an endless rack bar 105 and other connections exactly like those before described with reference to the stretchers L, for moving the stretchers M on the underside of the table.

When the teeth of the wheel 102 are in engagement with the pinion 101 the endless rack bar 100 and the cylinders 98, 99 secured thereto will be first pushed toward the needle carrier and thereupon taken back again; while the forward position of the hooks will always be the same, the backward position will depend upon the length of the straps and this is provided for by the yielding connection between the cylinders and their pistons, allowing the pistons to stop while the cylinders continue the backward movement. To the pistons are secured cords 106, 107 from which are hung counterweights 108, 109 that always keep the pistons up against the air cushion in the cylinders.

V. Feeding mechanism. (Fig. 5).—Slidable upon the table C is a pair of plates B B' which together form a slide between which the belt is held. This slide is provided with two sets of rack teeth 112, (Figs. 5 and 14) and engaging these teeth are pawls 110 provided on the needle carrier. As shown in Fig. 14 the pawls are mounted on vertically adjustable supports 110^a and are connected to retractile springs 110^b. At each swing of the needle carrier in one direction or the other the pawls will cause the slide to be pushed forward a certain amount, and the amount of feed may be regulated by vertically adjusting the pawl supports 110^a.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed I declare that what I claim is:

1. In a sewing machine of the character described, the combination with a working table, of a needle carrier pivoted above the

same at an angle relatively thereto, perforators connected to said needle carrier and means for oscillating the needle carrier and perforators in unison.

5 2. In a sewing machine of the character described, the combination with a working table, of a needle carrier comprising a plurality of pairs of juxtaposed rollers pivoted above and at an angle relatively to the table, and means for oscillating said needle carrier.

3. In a sewing machine of the character described, the combination with a working table, of a needle carrier pivoted above the same comprising a plurality of pairs of juxtaposed rollers, perforators joined to said needle carrier and means for oscillating the needle carrier and perforators in unison.

4. In a sewing machine of the character described, the combination with a working table, of a needle carrier pivoted above and at an angle relatively to the same, a frame secured to said needle carrier, a plurality of perforators carried by said frame, and means for oscillating the needle carrier and perforators in unison.

5. In a sewing machine of the character described, the combination with a working table, of a needle carrier pivoted above the same, comprising a plurality of pairs of juxtaposed rollers, gear wheels carried by certain of said pairs of rollers, and means co-acting with the gearing to revolve each roller of a pair in a direction opposite to that in which its mate is revolved.

6. In a sewing machine of the character described, the combination with a working table, of a needle carrier pivoted above and at an angle thereto, said needle carrier comprising a plurality of pairs of juxtaposed rollers, gear wheels carried by certain of said rollers, means co-acting with the gear wheels to cause the rollers of each pair to revolve in opposite directions, a perforating mechanism secured to the needle carrier and means for oscillating the latter and the perforator mechanism in unison.

7. In a sewing machine of the character described, the combination with a working table adapted to support the material to be operated upon, of perforating mechanism pivotally arranged above and at an angle to the table, means for operating said perforating mechanism to perforate the material supported by the table, and means pivoted above the table for passing a sewing strap through the perforations in the material at diverging angles.

8. In a sewing machine of the character described, the combination with a working table, of perforating mechanism pivoted at an angle above the table, a needle carrier extending above and below the table and oscillatable in relation to the latter, and means

for oscillating the needle carrier and perforating mechanism in unison. 65

9. In a sewing machine of the character described, the combination with a working table, of perforating mechanism comprising a frame and a plurality of perforators carried thereby pivoted above the table at an angle thereto, a needle carrier pivoted above and at an angle in relation to the table and extending above and below the latter, and means for oscillating the needle carrier and perforating frame in unison. 70 75

10. In a sewing machine of the character described, the combination with a working table, of a needle carrier pivoted relatively thereto and comprising longitudinal bars carrying a plurality of pairs of juxtaposed rollers, gear wheels carried by certain of said rollers, means co-acting with the gear wheels whereby the individual wheels of each pair are caused to be positively driven in opposite directions, perforating mechanism comprising a frame, and a plurality of reciprocating perforators therein, and means for oscillating the needle carrier and the perforating mechanism in unison. 80 85 90

11. In a sewing machine of the character described, the combination with a working table, of a needle carrier pivoted above the same and oscillatable in relation thereto, perforating mechanism connected to the needle carrier, and strap stretching mechanism movable in consonance with the movement of the needle carrier. 95

12. In a sewing machine of the character described, the combination with a working table, of a needle carrier extending above and below the table and at an angle thereto, perforating mechanism connected to and movable in unison with the needle carrier, means for stretching the sewing strap and means for operating said last named means in consonance with the movement of the needle carrier. 100 105

13. In a sewing machine of the character described, the combination with a working table, of a needle carrier comprising pairs of juxtaposed rollers, means for revolving said rollers to cause a needle to reciprocate between the pairs of rollers, and means for reversing the direction of rotation of said rollers comprising gear wheels on the ends of said rollers, rack bars meshing with the gear wheels and means for changing the direction of motion of said rack bars. 110 115

14. In a sewing machine of the character described, the combination with a working table, of a needle carrier comprising longitudinal bars having bearings therein, pairs of rollers mounted in the bearings, gear wheels carried by said rollers, rack bars adapted to engage said gear wheels and thereby rotate said rollers, clutch mechanism carried by two of said rollers, a pinion 120 125

adapted to mesh with said clutch mechanism, and means for reversing the direction of rotation of said rollers comprising mechanism for operating the clutch on either of
5 said rollers.

15. In a sewing machine of the character described, the combination with a working table, of a needle carrier comprising a plurality of pairs of rollers, gear wheels carried
10 by each of said rollers, rack bars adapted to mesh with said gear wheels to revolve the rollers, a plurality of two part clutches each thereof having one of its parts mounted upon one of the shafts of said rollers, and
15 means for rendering one of said clutches operative, said means comprising a pivoted lever, a projection carried by one of the rack bars adapted to contact with said lever, a rod toothed at a portion thereof associated
20 with said lever, a toothed segment in mesh with the toothed part of said rod and bell crank levers operable through the movement of said pivoted lever to throw either of said clutches into engagement.

25 16. In a sewing machine of the character described, the combination with a working table, of a needle carrier adapted to swing in relation thereto, and perforator mechanism movable in unison with said needle carrier,
30 said perforator mechanism comprising a plurality of perforators proper, and means for reciprocating the same once for each oscillation of the needle carrier.

35 17. In a sewing machine of the character described, the combination with a working table, of a needle carrier adapted to oscillate in relation thereto, a perforator designed to oscillate in unison with the needle carrier,
40 said perforator comprising a pair of side bars, pins upon which the same are mounted and designed to swing, slides reciprocable upon said bars and perforators proper carried by said slides.

45 18. In a sewing machine of the character described, the combination with a working table, of a needle carrier adapted to oscillate in relation thereto, perforator mechanism united to and adapted to oscillate in unison with, the needle carrier, said perforator
50 mechanism comprising a yoke and perforators proper mounted therein and means for reciprocating said perforators comprising a power shaft and arms connecting the same and the perforators.

55 19. In a sewing machine of the character described, the combination with a working table, of a needle carrier adapted to oscillate

in relation thereto, perforating mechanism secured to and designed to move in unison with said needle carrier, perforators proper
60 carried by said perforating mechanism, means for reciprocating the perforators and means for slightly rocking said perforators.

20. In a sewing machine of the character described, the combination with a working
65 table, of means for feeding material along the same in a step by step movement, a needle carrier pivoted above and at an angle to the table, perforating mechanism united to the needle carrier, and means for oscillat-
70 ing the needle carrier and perforating mechanism in unison.

21. In a sewing machine of the character described, the combination with a working
75 table, of means movable across the same for stretching a sewing strap, means for feeding material to be operated upon along the table in a step by step movement, a needle carrier pivoted above and at an angle to the table,
80 perforating mechanism, and means for oscillating the needle carrier and perforating mechanism in unison.

22. In a sewing machine of the character described, the combination with a working
85 table, of means for stretching a sewing strap, means for moving said stretching means longitudinally of the table, means for moving the material to be operated upon in a step by step movement along the table, a
90 needle carrier extending above and below the table and pivoted at an angle thereto, perforating mechanism, and means for oscillating the needle carrier and perforating mechanism in unison.

23. In a sewing machine of the character
95 described, the combination with a working table, of means for moving material to be operated upon along the same, a needle carrier pivoted at an angle to the table, means for causing a needle to traverse said carrier
100 and pass through the material, perforating mechanism, means for oscillating the needle carrier and perforating mechanism in unison, means above and below the table for stretching a sewing strap, and means for op-
105 erating said stretching means in consonance with the movement of the needle carrier.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

CARL MAAG LARSEN.

Witnesses:

HENRY BORDEWICH,
AUG. OLSEN.