

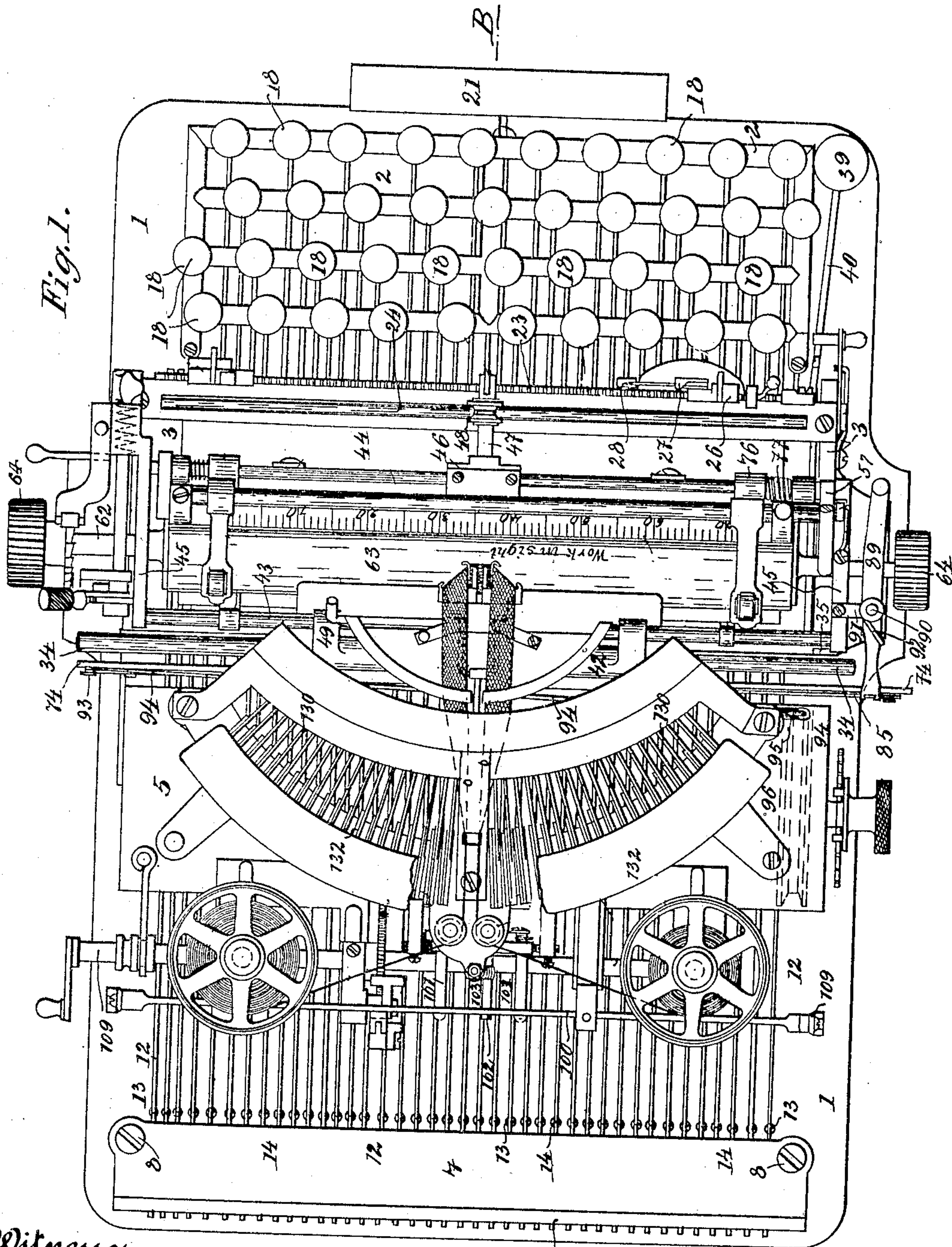
No. 878,378.

PATENTED FEB. 4, 1908.

W. GOERWITZ.
TYPE WRITER.

APPLICATION FILED JULY 11, 1905.

7 SHEETS—SHEET 1.



Witnesses

W. M. Avery

J. H. Hanaford

A.

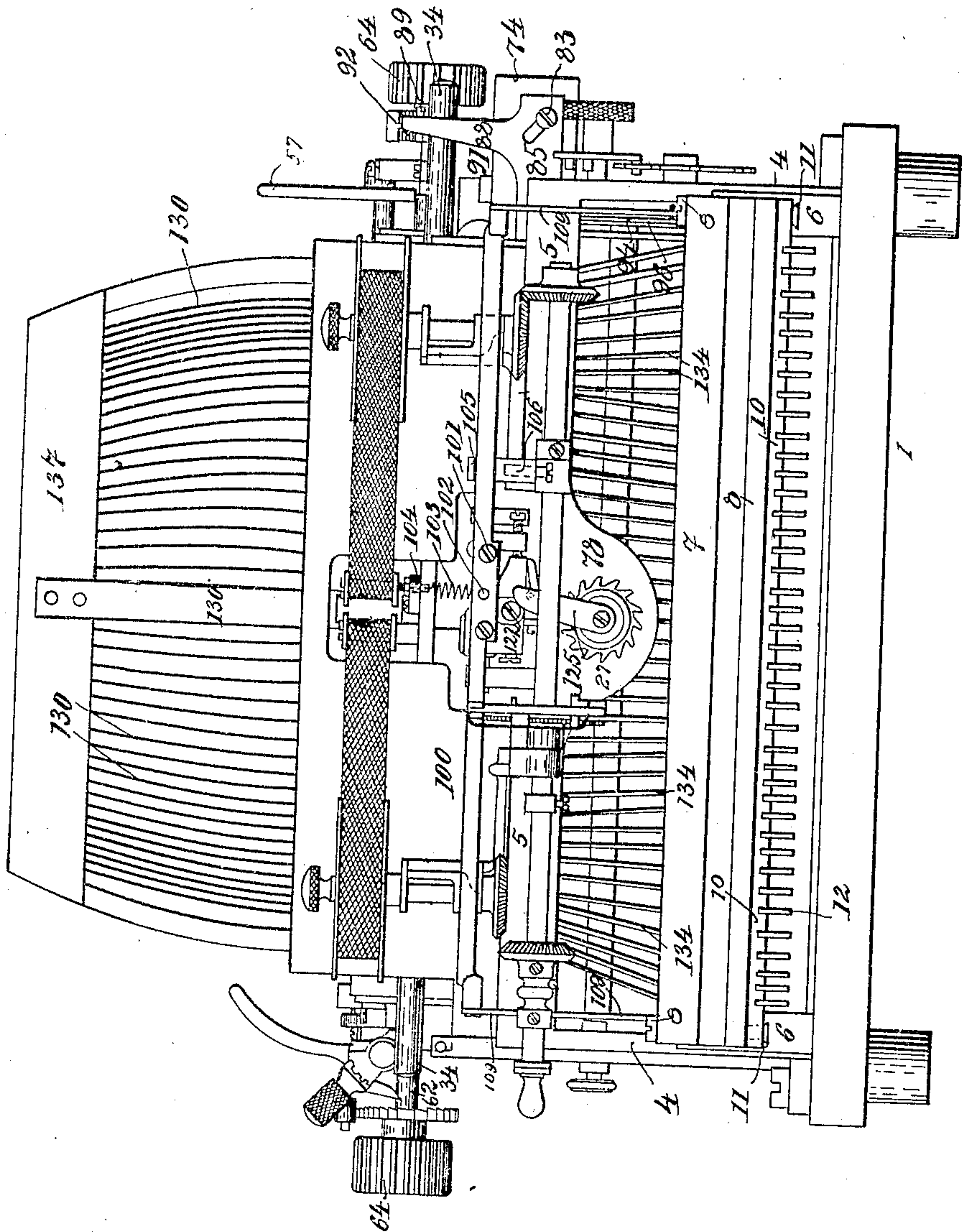
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Fig. 2.



Witnesses
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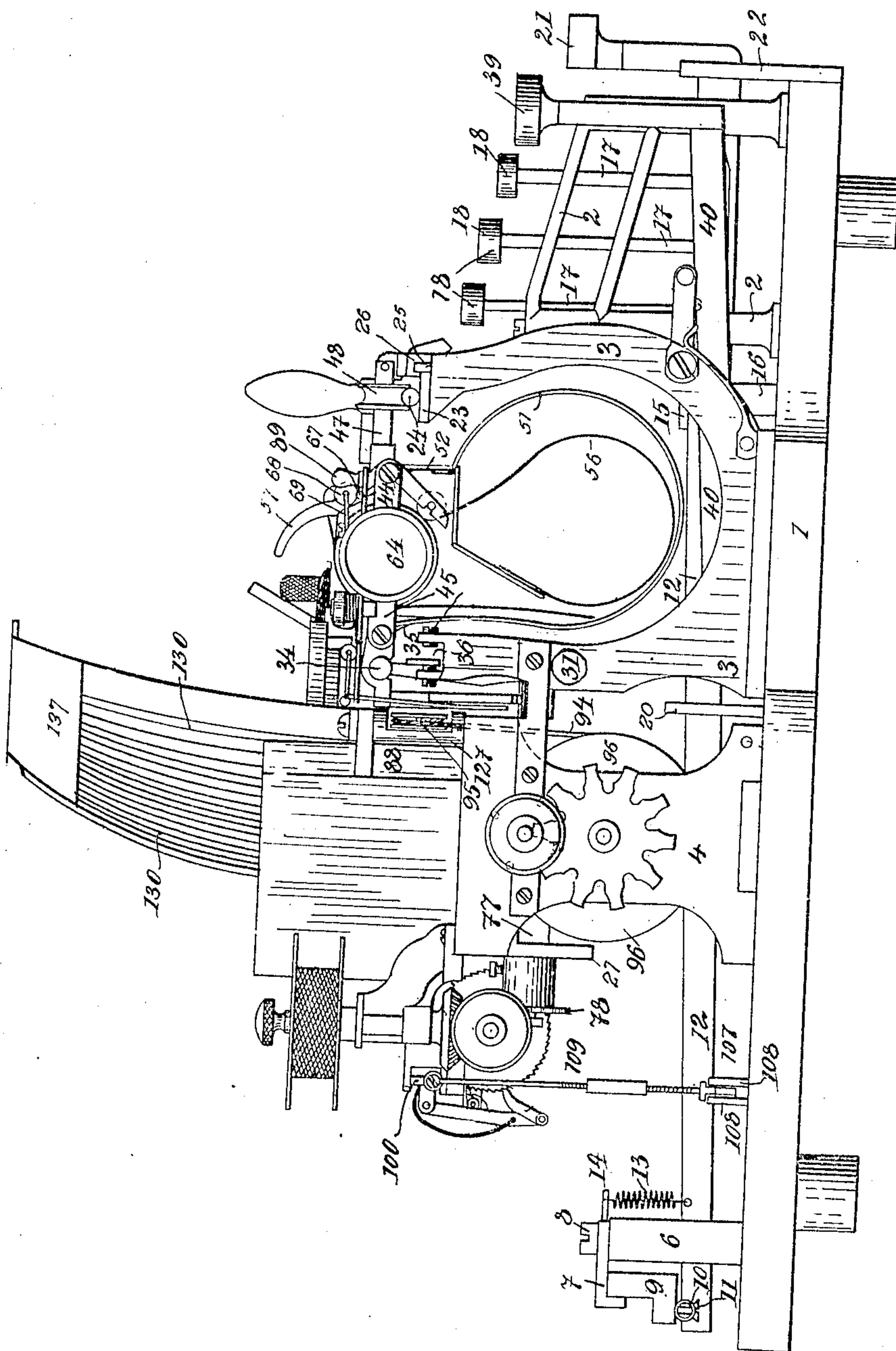
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7 SHEETS—SHEET 3.

Fig. 3.



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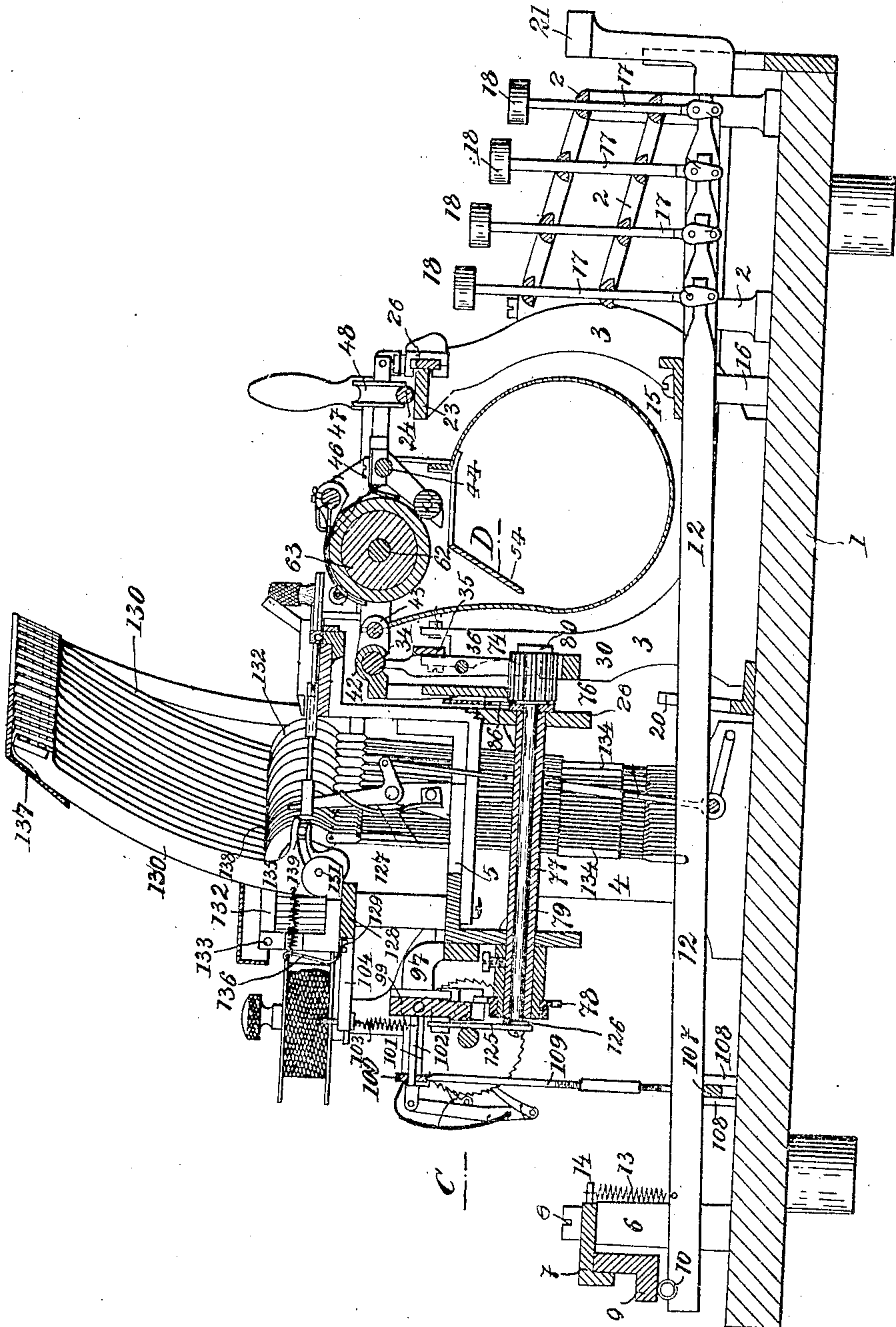
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7 SHEETS—SHEET 4.

Fig. 4.



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7 SHEETS—SHEET 5.

Fig. 6.

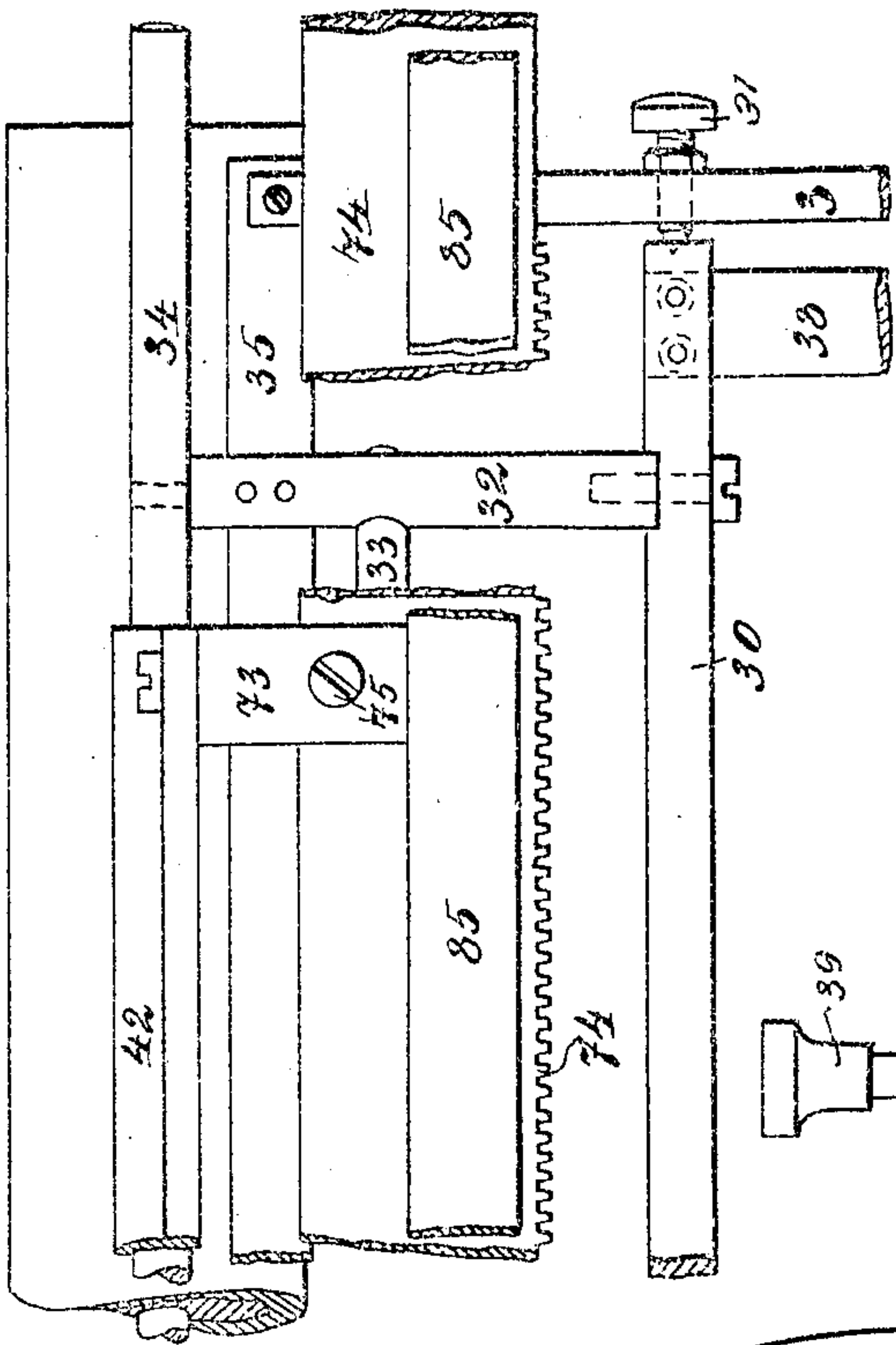


Fig. 7.

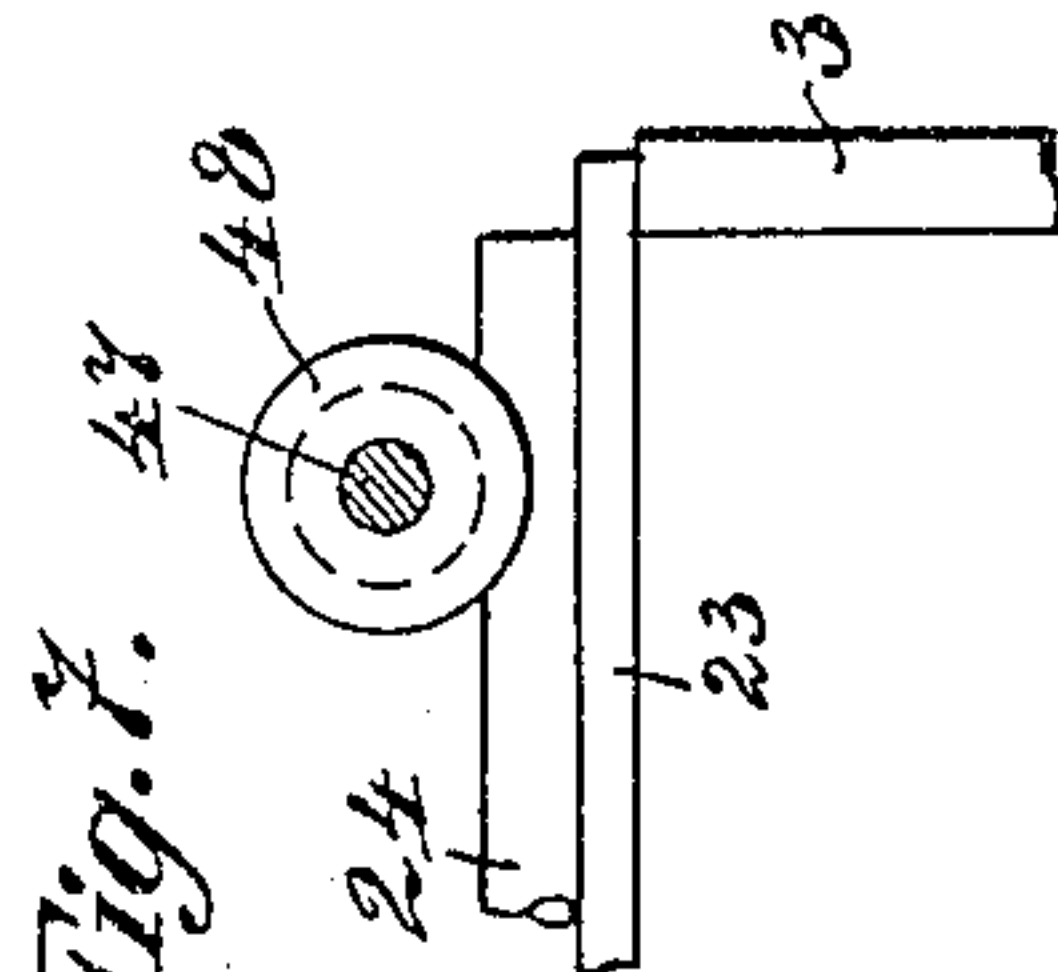
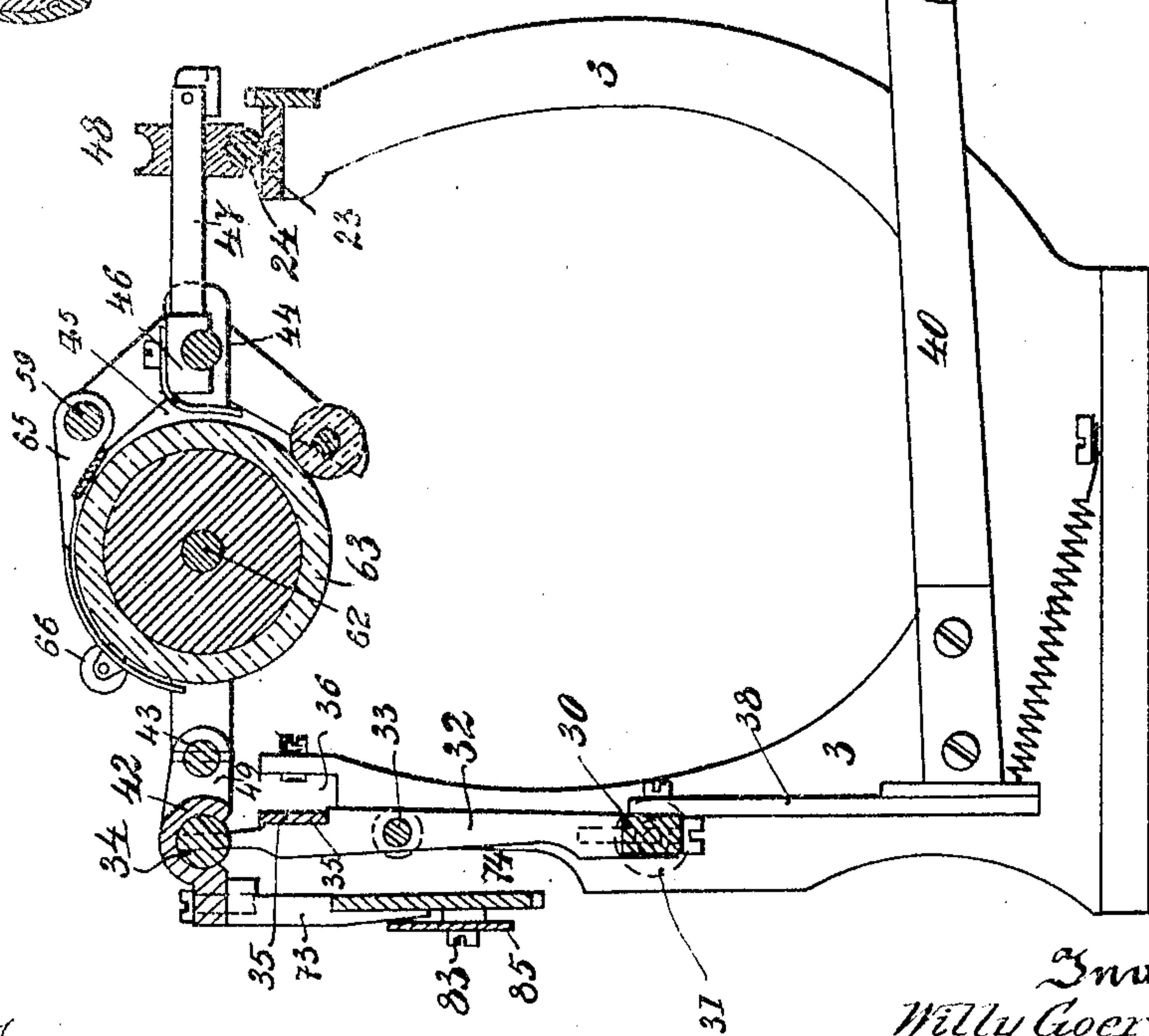


Fig. 5.



Witnesses
W. M. Aring

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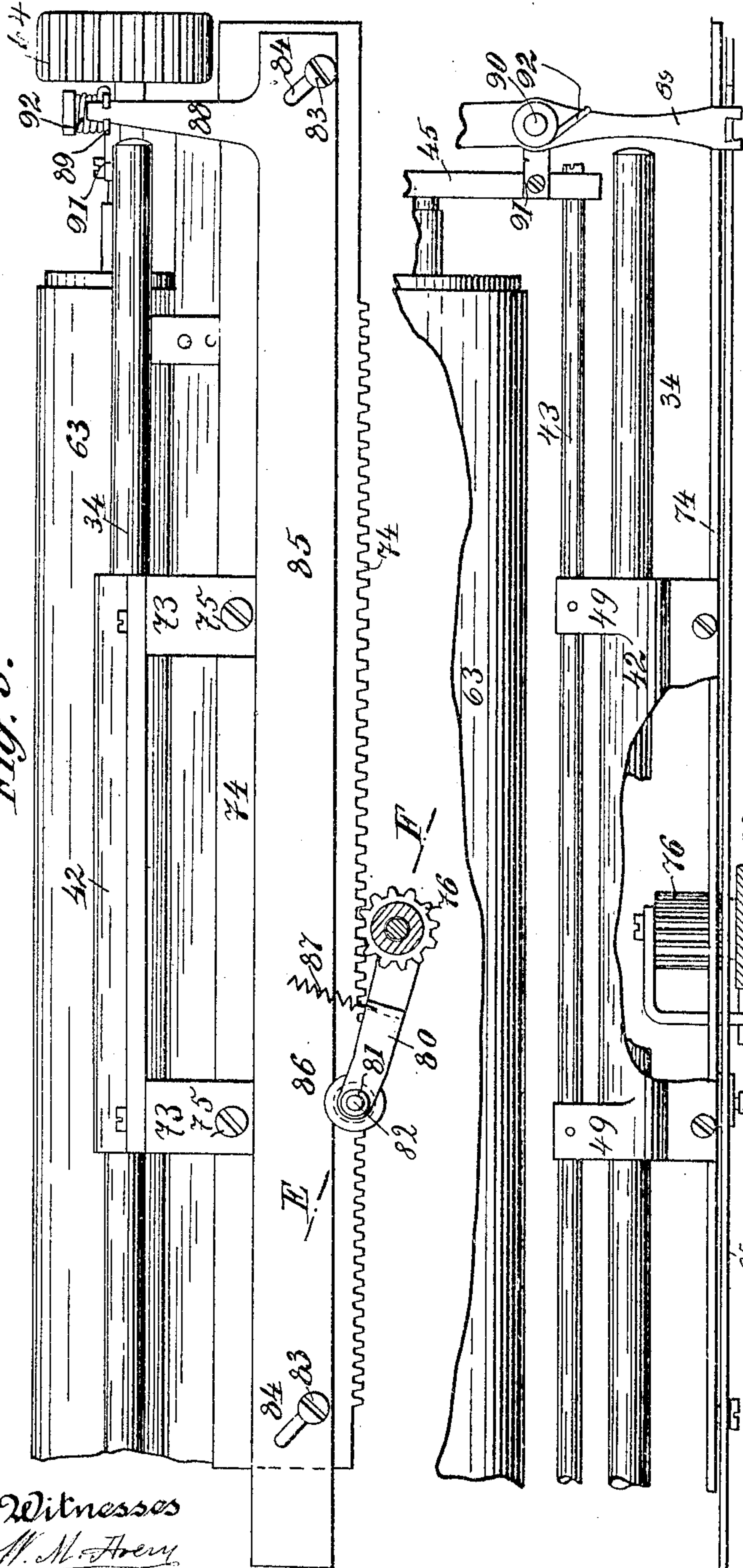
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7 SHEETS—SHEET 6.

Fig. 8.



Witnesses
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Fig. 10.

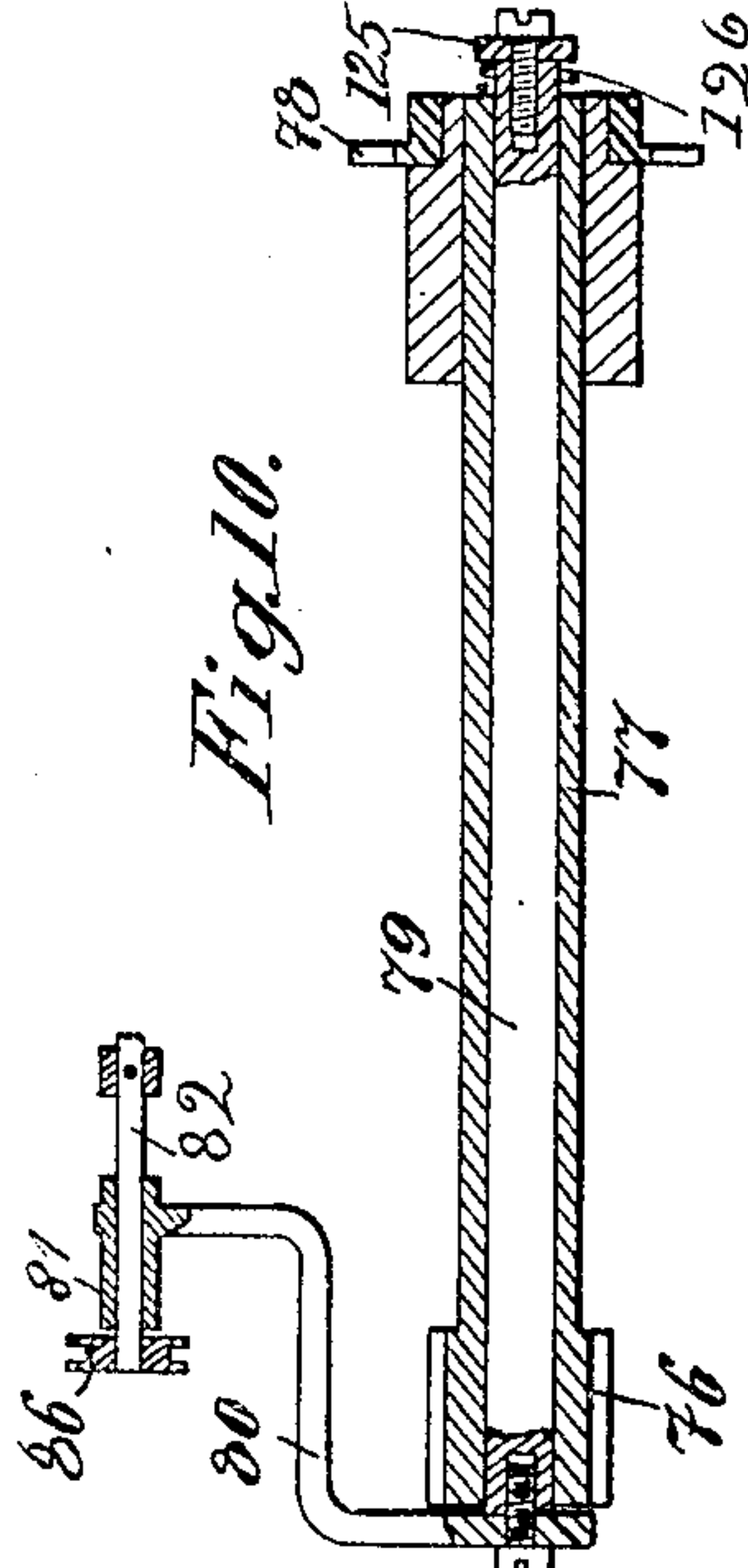
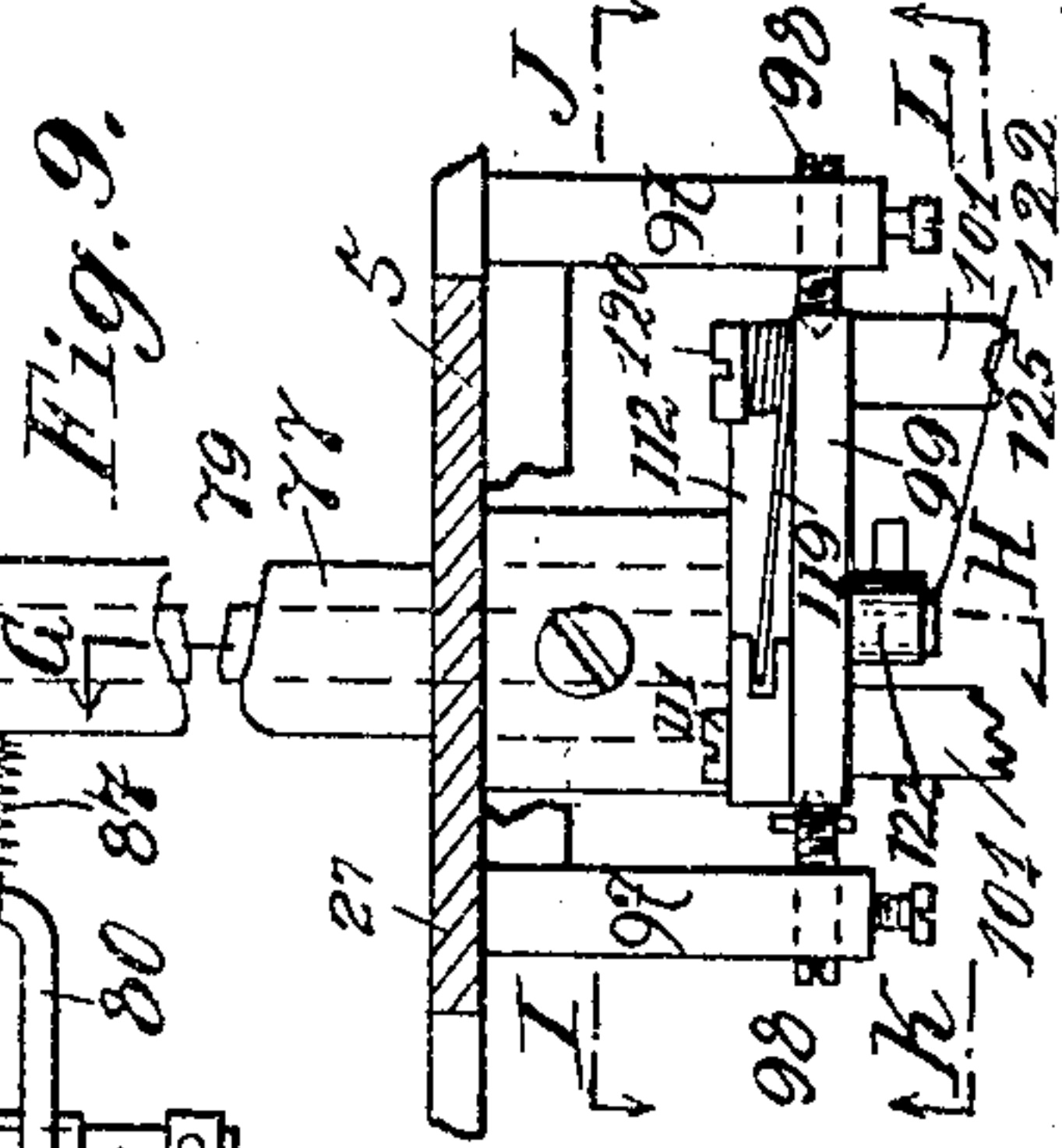


Fig. 9.



No. 878,378.

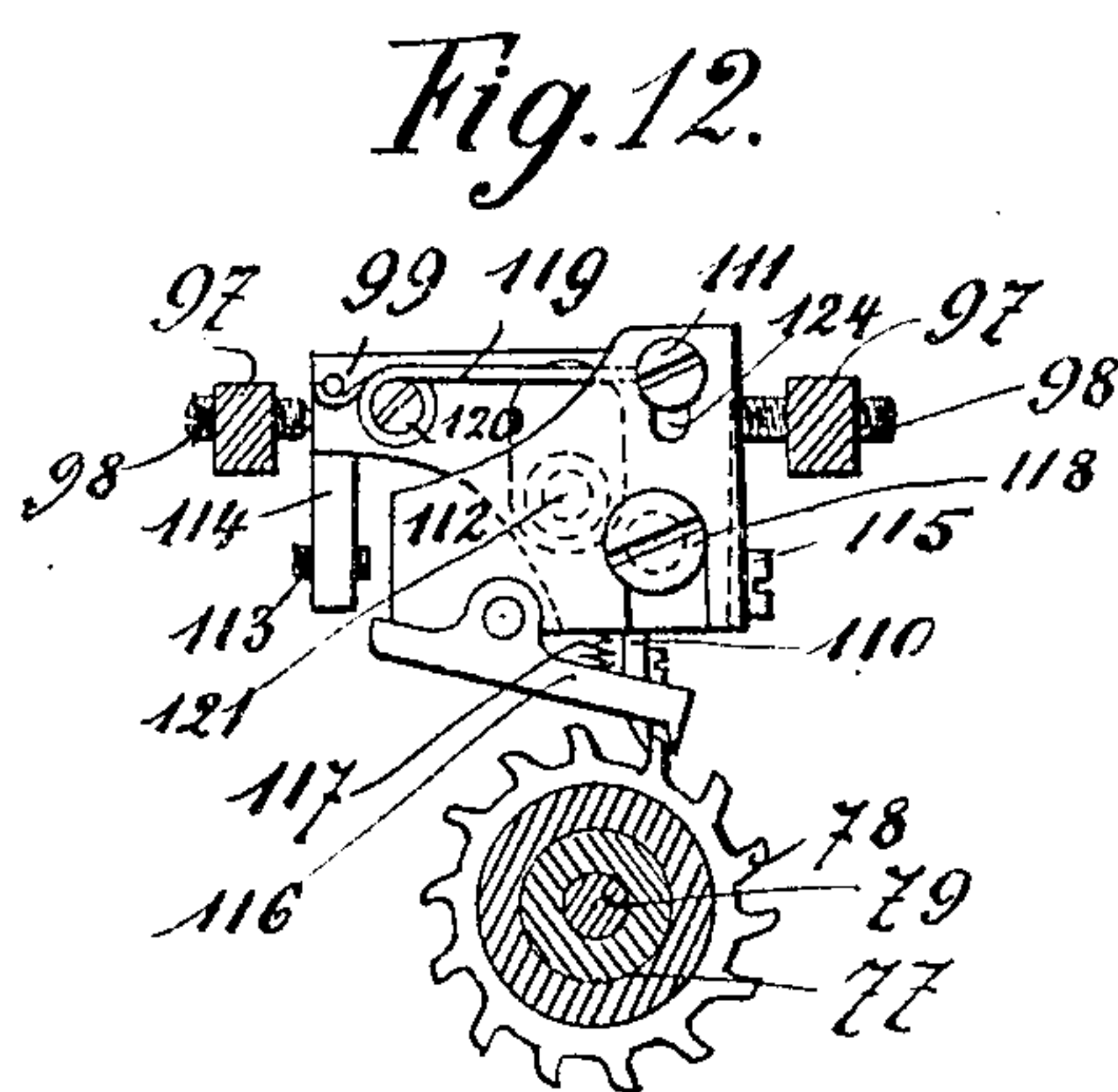
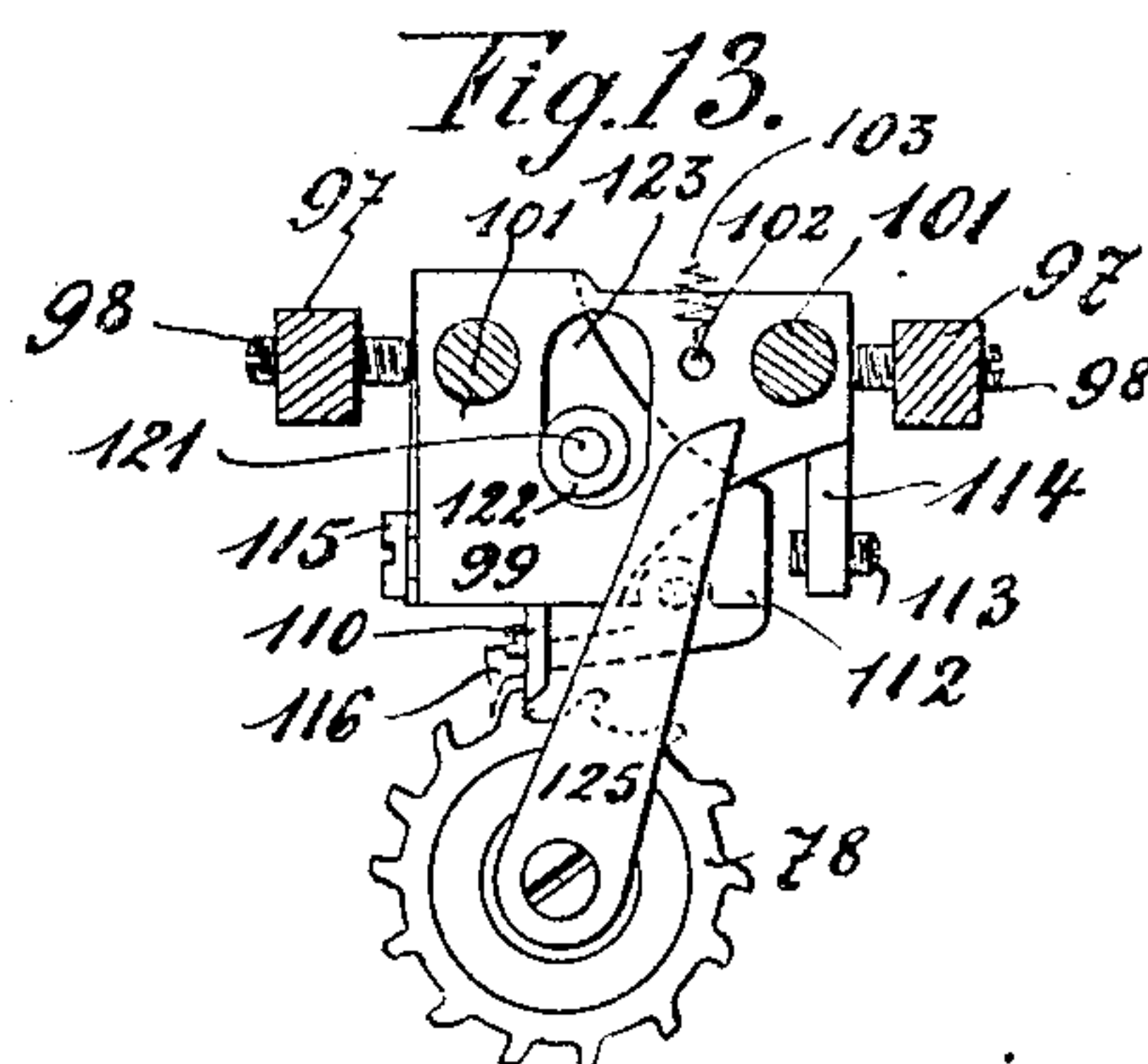
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APPLICATION FILED JULY 11, 1905.

7 SHEETS—SHEET 7.



WITNESSES :

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UNITED STATES PATENT OFFICE.

WILLY GOERWITZ, OF BERLIN, GERMANY.

TYPE-WRITER.

No. 878,378.

Specification of Letters Patent.

Patented Feb. 4, 1908.

Application filed July 11, 1905. Serial No. 269,158.

To all whom it may concern:

Be it known that I, WILLY GOERWITZ, a citizen of the Empire of Germany, residing at Berlin, in the Empire of Germany, have invented a new and useful Type-Writer, of which the following is a specification.

There are various known manners of feeding the carriage of a type-writer. In type-writers with type levers and with a carriage feed mechanism comprising an escapement wheel and a movable or oscillating click carrier it is already known to either lift the carriage with its rack out of engagement with the pinion on the escapement wheel shaft, or to move the said pinion out of engagement with the rack of the carriage, or to disconnect the said pinion from the escapement wheel shaft.

My invention relates to an improvement in such carriage feed mechanisms in type-writers and the improvement consists in that the pawl normally engaging the escapement wheel for stopping the carriage is adapted to be moved out of engagement with the escapement wheel for releasing the carriage. This improvement presents the advantage, that the teeth of the rack on the carriage and those of the pinion are protected from excessive wear and breaking, since the pinion remains in constant engagement with the rack during the engagement and disengagement of the carriage. Thereby during the disengagement and much more during the engagement of the carriage the shocks, which are inevitable in the known mechanisms, are kept off from the teeth of the rack and pinion, more particularly from their tops.

I am aware, that there are known carriage escapement mechanisms, in which the pawls mesh direct with the rack on the carriage, so that for releasing the latter that pawl which normally engages the rack is withdrawn or moved out of engagement with the same. However such escapement mechanisms present the same defects as the first mentioned feed mechanisms, the teeth of both the rack and the pawl being easily damaged or broken during the withdrawal and more particularly during the engagement of the pawl.

With my improved carriage feed mechanism this defect is avoided, since on the one hand the pinion remains in constant engagement with the carriage rack and on the other hand the pawl is made to work with a special escapement wheel, so that the ratio of the

pinion and the escapement wheel can be proportioned at pleasure without heightening the type-writer and that the teeth of the escapement wheel and those of the two pawls can be made sufficiently large and strong to prevent them from breaking.

I will now proceed to describe my invention with reference to the accompanying drawings, in which—

Figure 1 is the plan of a complete type-writer provided with my improved carriage feed mechanism, Fig. 2 is a rear view of the same, Fig. 3 is an elevation of the left side of the same, seen in the direction from below in Fig. 1, Fig. 4 is a vertical longitudinal section through the same on the line A—B in Fig. 1, Fig. 5 is a part out of Fig. 4 on an enlarged scale, Fig. 6 is a rear view of a part of the carriage and the upper part of the support shown at Fig. 5, a part of the rack being broken away, Fig. 7 is a front view of the upper right part of the same support, Fig. 8 is a rear view of the left part of the carriage, Fig. 9 is in the upper portion a plan of the rear part of the same, parts being broken away, and in the middle portion a horizontal section through the line C—D in Fig. 4 and in the lower portion a plan of the escapement, parts being broken off, Fig. 10 is a section through the line E—F in Fig. 8, Fig. 11 is a vertical section through the line G—H in Fig. 9, seen in the direction of the arrows, Fig. 12 is a vertical section through the line I—J in Fig. 9, seen from the front in the direction of the arrows, and Fig. 13 is a vertical section through the line K—L in Fig. 9, seen from the rear in the direction of the arrows.

Similar characters of reference refer to similar parts throughout the several views.

In the drawings I have shown for example a type-writer, which may be provided with my carriage feed mechanism.

On the base plate 1 are secured a frame 2 on the front for the key board, two forked side supports 3, 3 behind the latter for the carriage, two side supports 4, 4 for a bridge 5 and two cylindrical supports 6, 6 at the rear corners for a cross plate 7. This plate 7 is shown as fixed on the two supports 6, 6 by means of screws 8, 8 and carrying a bar 9. A tube 10 is secured on the lower face of the bar 9 by means of screws 11, 11 and a series of parallel key levers 12, 12 is mounted to rock on the lower half surface of the tube 10. Helical springs 13, 13 connecting the key levers 12, 12 with pins 14, 14 on the plate 7

serve for pressing the key levers 12, 12 upwards against a bridge 15, which is supported by two studs 16, 16 on the base plate 1. The shafts 17, 17 of the keys 18, 18 are vertically guided in the frame 2 and are provided at their lower ends with slots, in which the front ends of the key levers 12, 12 engage. The central key lever 12 is lengthened to the front and bent upward to carry a spacing key 21.

On the upper ends of the front arms of the two forked side supports 3, 3 is fastened a cross plate 23 with a rod 24 which latter serves as a guide for the carriage. A horizontal shaft 30 is mounted to rock between two pointed screws 31, 31 (Figs. 3, 4, 5 and 6) in the rear arms of the side supports 3, 3 and carries two vertical arms 32, 32, which are united by a cross rod 33 parallel to the shaft 30 and carry a round horizontal rod 34 and a horizontal bar 35. The rod 34 serves as a rear guide for the carriage. On the left end of the shaft 30 is fastened an arm 38, which is rigidly connected with a shift key 39 by means of a crank arm 40. A helical spring 41 serves for pressing the bar 35 rearwards and the shift key 39 upwards into its normal position. The carriage comprises a bearing 42, a rectangular frame formed of the rear rod 43, the front rod 44 and the two side portions 45, 45, a cross-head 46 with a horizontal axle 47 and a roller 48. The bearing 42 is adapted to slide on the guide rod 34, while the latter is permitted to relatively rock in the bearing 42. The rear rod 43 is fastened in two arms 49, 49 of the bearing 42, see Fig. 1, and the crosshead 46 is fastened with screws on the front rod 44. The roller 48 is arranged to roll on the front guide rod 24 and at the same time it is adapted to turn and to longitudinally move on the axle 47. A paper support 51 of sheet metal open at the sides is suspended from the front and rear carriage rods 44 and 43. A horizontal shaft 62 carrying the platen-roll 63 and the two knurled knobs 64, 64 is mounted to turn in the side portions 45, 45 of the carriage. I do not further describe the carriage, as it forms no part of my invention.

On the rear of the bearing 42 are fastened two downwardly projecting arms 73, 73 (Figs. 5 and 6), on which the rack 74 of the carriage is fastened with screws 75, 75 (see also Fig. 8). This rack 74 meshes with a pinion 76 (Fig. 4), which is made long, so as to always remain in engagement with the rack 74, should the shift key 39 be depressed to move the carriage with the platen-roll 63 to the front. The pinion 76 is in Fig. 10 shown as made in one piece with a hollow shaft 77, which is mounted in two pendent projections 27 and 28 of the bridge 5 to turn, see Figs. 2, 4, 9 and 11. On the rear end of the hollow shaft 77 is fastened an escapement wheel 78. The shaft 30 is in its middle re-

cessed to leave space for the pinion 76. In the bore of the hollow shaft 77 a shaft 79 is mounted to rock and to move a little longitudinally. On the front end of this shaft 79 is fastened a crank 80, which is bent in the manner shown in Figs. 9 and 10 and is provided at its free end with a bearing 81, in which a shaft 82 is mounted to turn and to longitudinally move. Fastened on the rack 74 are two pins 83, 83 (Fig. 8), which engage in inclined slots 84, 84 of a plate 85, which is thus guided vertically on the rack 74. A grooved roller 86 is fastened on the shaft 82 and is adapted to roll on the bottom face of the plate 85. A helical spring 87 (Fig. 9) connecting the crank arm 80 with the bridge 5 serves for pressing the roller 86 and thereby the plate 85 upwards, so that the latter normally occupies the position shown at Fig. 8, the lower ends of the two inclined slots 84, 84 bearing from below on the two pins 83, 83. The shaft 82 is made long to permit the roller 86 to follow the motion of the carriage to the front, on the shift key 39 being depressed. The plate 85 is at its left end provided with an upwardly projecting arm 88, which engages in the forked end of a two-armed lever 89. The latter is mounted to rock around a vertical pin 90 provided on a bracket 91 of the left side portion 45 of the carriage. A spring 92 (Fig. 1) tends to press the rear arm of the lever 89 to the right and thus helps the spring 87 in holding the plate 85 in its upper position. On moving the front arm of the lever 89 with one's finger to the right, its rear arm will move the arm 88 to the left, so that the plate 85 guided by the pins 83, 83 engaging its slots 84, 84 will be lowered and depress the roller 86 with the crank arm 80, to produce a certain effect, which will be explained later on.

At the right end of the rack 74 is fastened a pin 93, to which the end of a lace 94 is attached (Fig. 1). This lace 94 is led over a guiding pulley 95 and its other end is fastened on the periphery of a spring-barrel 96, which latter serves for moving the carriage to the left as usual and may be wound in any known manner.

On the bridge 5 are fastened two brackets 97, 97 (Figs. 4, 9, 11, 12 and 13), which are provided with pointed screws 98, 98. Between these screws 98, 98 a plate 99 is mounted to rock around a horizontal axis. This plate 99 is rigidly connected with a horizontal cross bar 100 by means of two studs 101, 101 and is provided with a pin 102, which is connected by a helical spring 103 with a suitable bracket 104 on the frame above the bridge 5. Thereby the horizontal bar 100 is pressed upwards against a stop 105 while its downward stroke is limited by an adjustable screw 106 (Fig. 2). Beneath the whole series of key levers 12 passes a horizontal bar 107, the ends of which are guided between

suitable guides 108, 108 and are pivotally connected with the corresponding ends of the horizontal bar 100 by means of adjustable rods 109, 109. It will be seen, that on depressing any key 18 or the spacing key 21 the lower horizontal bar 107 will also be depressed and take along with it the upper horizontal bar 100, so that the plate 99 will be turned to the front. On releasing the key the key lever 12 will be returned to its upper position by its helical spring 13, while the two horizontal bars 107 and 100 and the two rods 109, 109 will be returned to their upper position by the spring 103.

The plate 99 is provided with a detent 110, which is adapted to engage in any tooth space of the escapement wheel 78 on the plate 99 being turned to the front, while normally it just remains without the plane of the escapement wheel 78, see Fig. 11. On the plate 99 is fastened a pin 111, on which a second plate 112 is mounted to rock between two stops, the one stop being a screw 113 in an arm 114 of the plate 99 and the other stop being the head 115 of a screw screwed into the plate 99. The plate 112 is provided with a pawl 116, which is pressed downwards by a spring 117, so that its rear arm rests on the bottom face of the plate 112. A screw 118 screwed into the plate 99 engages in a slot of the plate 112 and serves for guiding the latter on the plate 99. A spring 119 wound around a pin 120 (Fig. 9) on the plate 99 tends to press the plate 112 against the stop 115, so that the tooth of the pawl 116 does not register with the detent 110 as is shown at Fig. 12. Normally, however, under the action of the spring barrel 96 the respective tooth of the escapement wheel 78 bears on the tooth of the pawl 116 and turns the plate 112 around the pin 111 to the left against the other stop 113, so that the tooth of the pawl 116 flushes or registers with the detent 110. It will now be evident, that on either key 18 or the spacing key 21 being depressed and thereby the two plates 99 and 112 being turned to the front the detent 110 will engage the tooth of the escapement wheel 78 and prevent the latter from turning, while the tooth of the pawl 116 is withdrawn from the escapement wheel. Then the spring 119 will turn the plate 112 to the right into the position shown at Figs. 12 and 13, so that on the key being released the tooth of the pawl 116 will engage in the next following tooth space of the escapement wheel 78. Then the latter will move and its next following tooth will strike the tooth of the pawl 116 and press the plate 112 against the stop 113, which means, that the carriage will have been fed through the distance of a type width. In order to disengage the carriage from the escapement wheel 78 and to freely move it in either direction, the following arrangement is made. A pin 121 is screwed into the plate 112 and on this pin

121 a roller 122 is mounted to turn. The plate 99 is provided with a slot 123 for the passage of the roller 122 and the plate 112 is provided with a slot 124 for the pin 111, so that it can be shifted upwards to bring the tooth of the pawl 116 out of engagement with the escapement wheel 78. On the rear end of the shaft 79 already mentioned above a crank arm 125 is fastened, while a spiral spring 126 is preferably inserted between this crank arm 125 and the hollow shaft 77 to enable the roller 86 to better follow the motion of the plate 85. The crank arm 125 is arranged to engage beneath the roller 122 and thereby to lift the plate 112. It will now be seen, that on depressing the plate 85 with the roller 86 and the crank arm 80 by means of the lever 89 in the manner explained above the rear crank arm 125 will lift the plate 112 and thereby bring the pawl 116 out of engagement with the escapement wheel 78, so that the carriage can be now freely moved in either direction.

Three studs 127, 127 are secured on the bridge 5 for supporting a curved plate 128. On this plate 128 rests an arch-shaped bearing 129 for the type levers 130, 130. This bearing 129 is provided with radial slots in which the naves of the type levers 130, 130 can turn on a bent axle 131. The upper edge of the bearing 129 is also provided with radial slots, in which the external ends of bent levers 132, 132 are mounted to turn on a bent axle 133. The lower internal ends of the bent levers 132, 132 are pivotally connected with the key levers 12, 12 by means of adjustable rods 134, 134. Helical springs 135 connecting the type levers 130, 130 near their fulcrums with elastic arms 136 without the bearing 129 pass through holes in the bearing and tend to press the upper ends of the type levers 130, 130 against a curved top plate 137. The bent levers 132, 132 are each provided with a pin 138, which engages in a bent slot 139 in an arm of the respective type lever 130. It will be seen, that on depressing any key 18 the corresponding key lever 12 will pull its adjustable rod 134 and thereby turn the respective bent lever 132. The pin 138 of the latter engaging in the curved slot 139 will slide in the latter towards the axle 131 and swing the type lever 130 downwards to strike the paper 56 on the platen-roll 63.

The type-writer is operated as follows: In writing the respective key 18 is depressed, so that its key lever 12 will pull downwards its adjustable rod 134, to turn the type lever 130 to the front and downwards, so that its respective type strikes the paper on the platen-roll 63. The key lever 12 will also depress the lower horizontal bar 107 and by the two adjustable rods 109, 109 move downwards the upper horizontal bar 100, to turn the plate 99 to the front. The detent 110 of the latter will engage the escapement wheel 78 and pre-

vent it from moving, while the tooth of the pawl 116 is disengaged from the wheel 78 and is moved to the right by the spring 119 into the position shown at Fig. 12. On the key being released the two horizontal bars 107 and 100 with the two adjustable rods 109, 109 will be returned to their upper position by the spring 103, so that the plate 99 is turned to the rear and its detent 110 is brought out of engagement with the escapement wheel 78, while the tooth of the pawl 116 engages in the next following tooth space and is soon moved to the left by the following tooth striking it, so that it now registers with the detent 110. Now another key 18 may be depressed, when all the occurrences just described will repeat. For changing from the one kind of types to the other kind the shift key 39 is depressed, when the carriage will be moved to the front in the manner described above. If it is desired to disengage the carriage, the lever 89 is turned to the right to depress the plate 85 with the roller 86 and the crank arm 80 and to lift by the crank arm 125 and the roller 122 the plate 112, so that the pawl 116 is disengaged from the escapement wheel 78.

The carriage feed mechanism described may be varied without departing from its principle. It may be applied to other known type-writers of a convenient construction.

I claim:

1. In a type-writer, the combination with a rack on the carriage, of a shaft mounted in the frame to turn, a pinion on said shaft and permanently meshed with said rack, an escapement wheel on said shaft, a plate mounted in the frame to rock around an axis at right angles to said shaft, means for transmitting the motion from any key to said plate, a detent fast on said plate and adapted to engage in said escapement wheel on the key being depressed, a pawl-carrier mounted on said plate to rock and to slide, a spring-pressed pawl on said pawl-carrier and adapted to normally engage in said escapement wheel it being thereby pressed in one direction so that its tooth registers with said detent, a spring pressing said pawl-carrier in the opposite direction so that said spring-pressed pawl on being released is shifted into a position for engagement in the following

tooth space of said escapement wheel, and means independent of the keys for shifting at will said pawl-carrier and thereby moving said spring-pressed pawl out of engagement with said escapement wheel to liberate the carriage.

2. In a type-writer, the combination with a rack on the carriage, of a hollow shaft at right angles to said rack and mounted in the frame to turn, a pinion at the one end of said hollow shaft and permanently meshing with said rack, an escapement wheel at the other end of said hollow shaft, a vertical plate mounted in the frame to rock around an axis at right angles to said hollow shaft, means for transmitting the motion from any key to said vertical plate, a detent fast on said vertical plate and adapted to engage in said escapement wheel on the key being depressed, a pawl-carrier mounted on said vertical plate to rock and to vertically slide and provided with a projection, a spring-pressed pawl on said pawl-carrier and adapted to normally engage in said escapement wheel it being thereby pressed in one direction so that its tooth registers with said detent, a spring pressing said pawl-carrier in the opposite direction so that said spring-pressed pawl on being released is shifted into a position for engagement in the following tooth space of said escapement wheel, a shaft mounted in said hollow shaft to rock, an arm at the one end of said shaft and adapted to press upon the projection of said pawl-carrier, a second arm at the other end of said shaft and carrying a roller, a spring pressing said second arm in one direction, a plate parallel to said rack and vertically guided on the carriage and in contact with said roller, and means for vertically pressing at will said plate for moving said second arm in the opposite direction and thus shifting said pawl-carrier and thereby moving said spring-pressed pawl out of engagement with said escapement wheel to liberate the carriage.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLY GOERWITZ.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.