

W. J. BARRON.
TYPE WRITING MACHINE.
APPLICATION FILED APR. 29, 1908.

Patented May 31, 1910.

7 SHEETS—SHEET 1.

959,696.

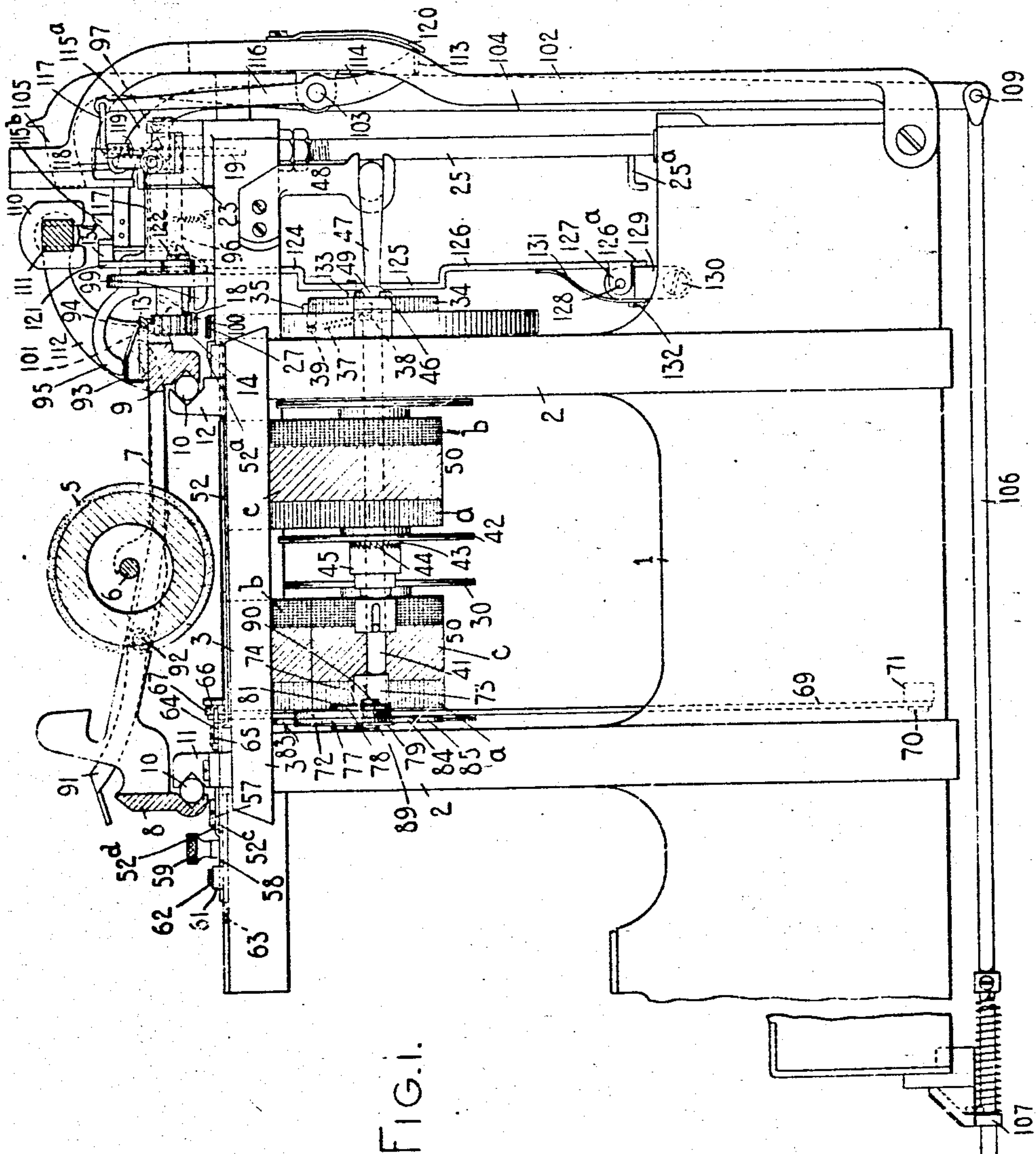


FIG. 1.

WITNESSES:

M. F. Hammer
M. W. Pool

INVENTOR:

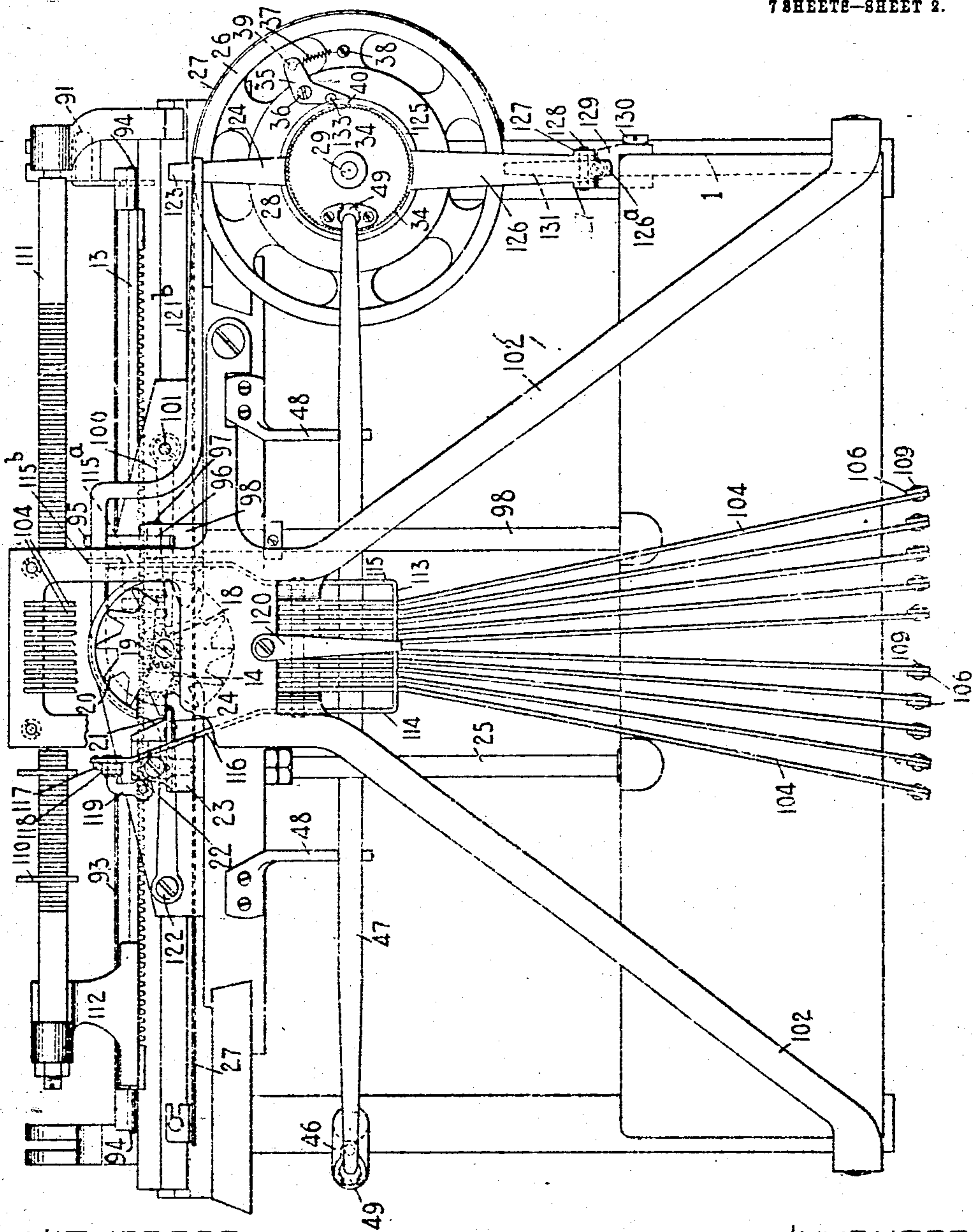
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7 SHEETS—SHEET 2.



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FIG. 2

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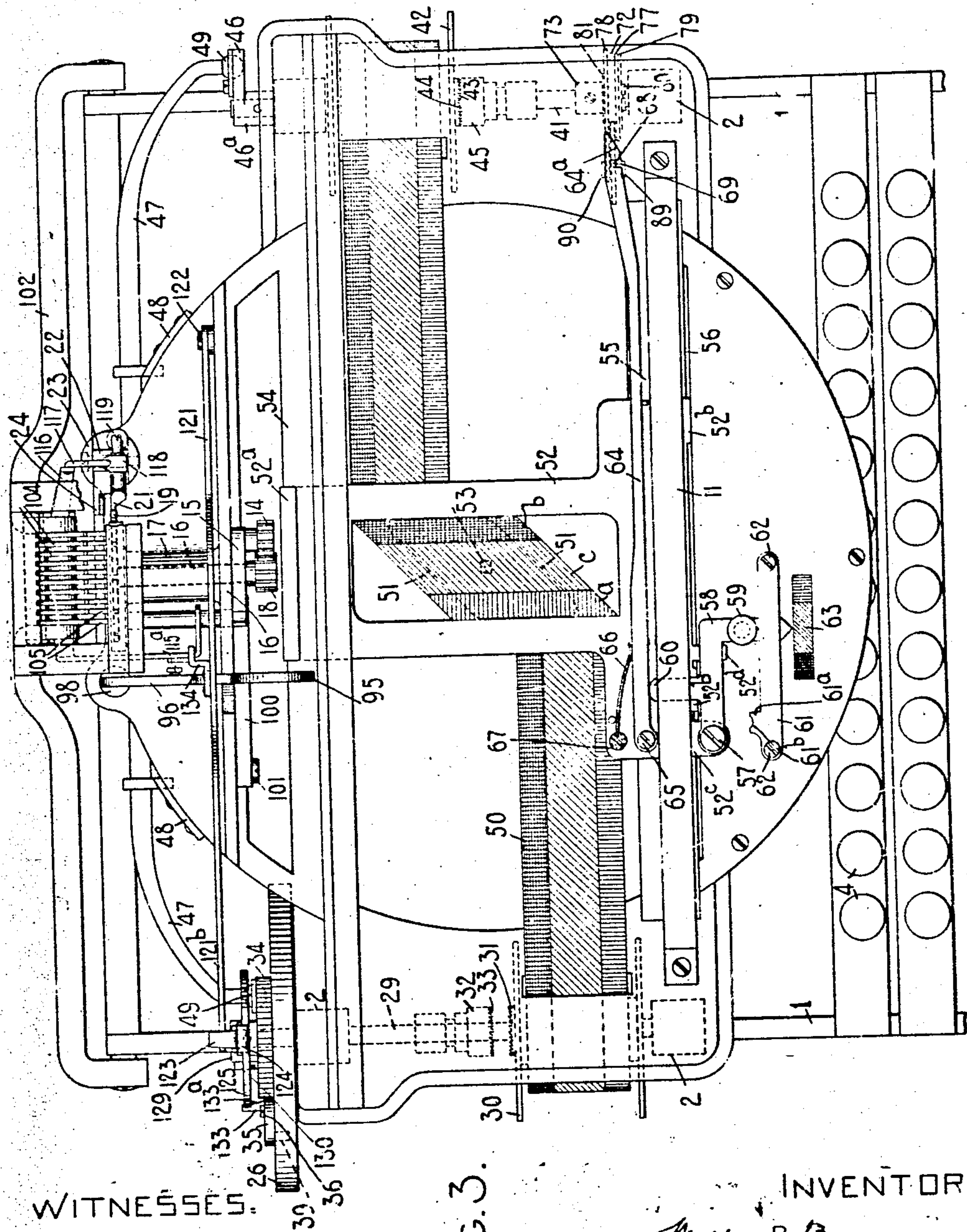


FIG. 3.

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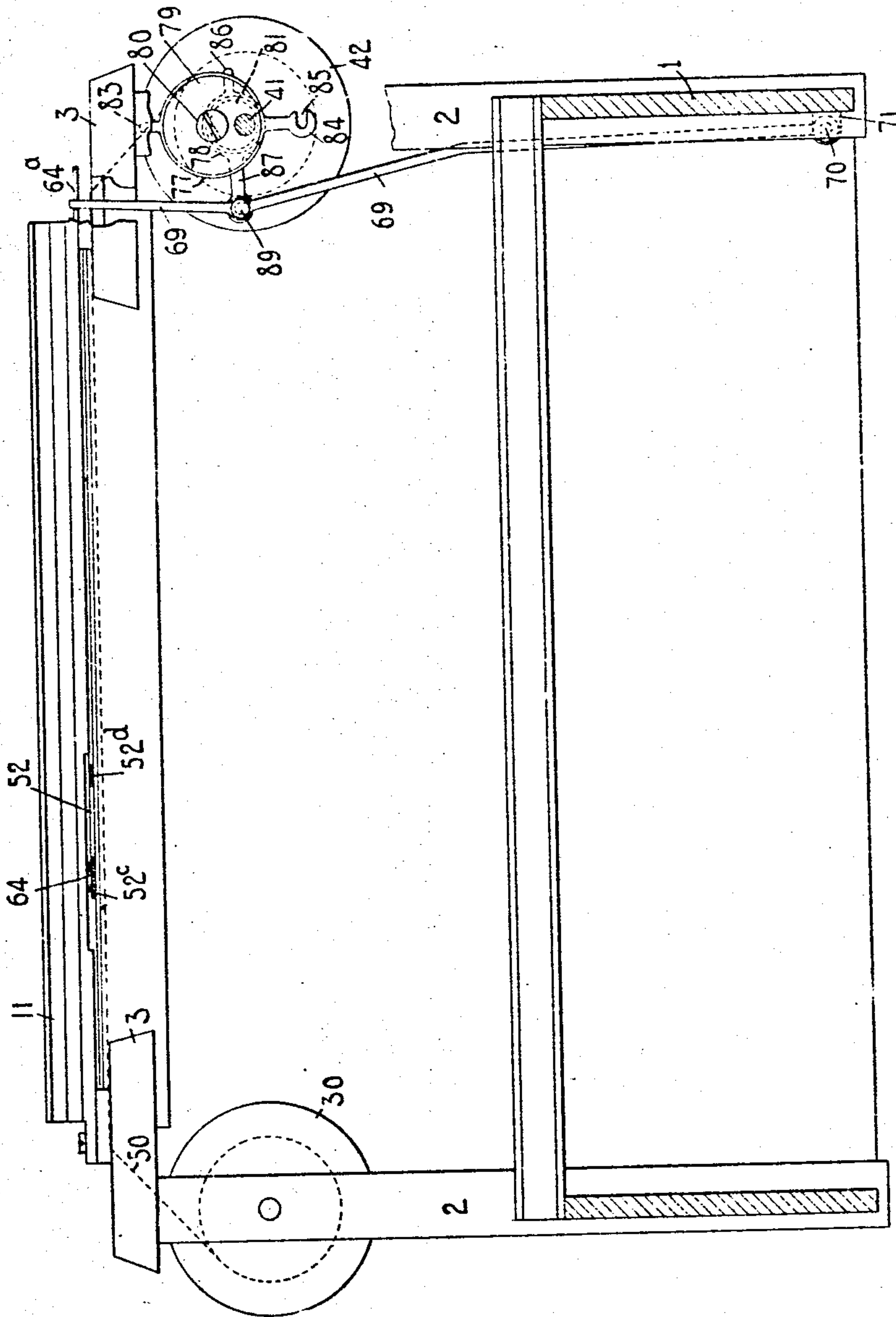
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7 SHEETS—SHEET 4.

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FIG. 4



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7 SHEETS—SHEET 5.

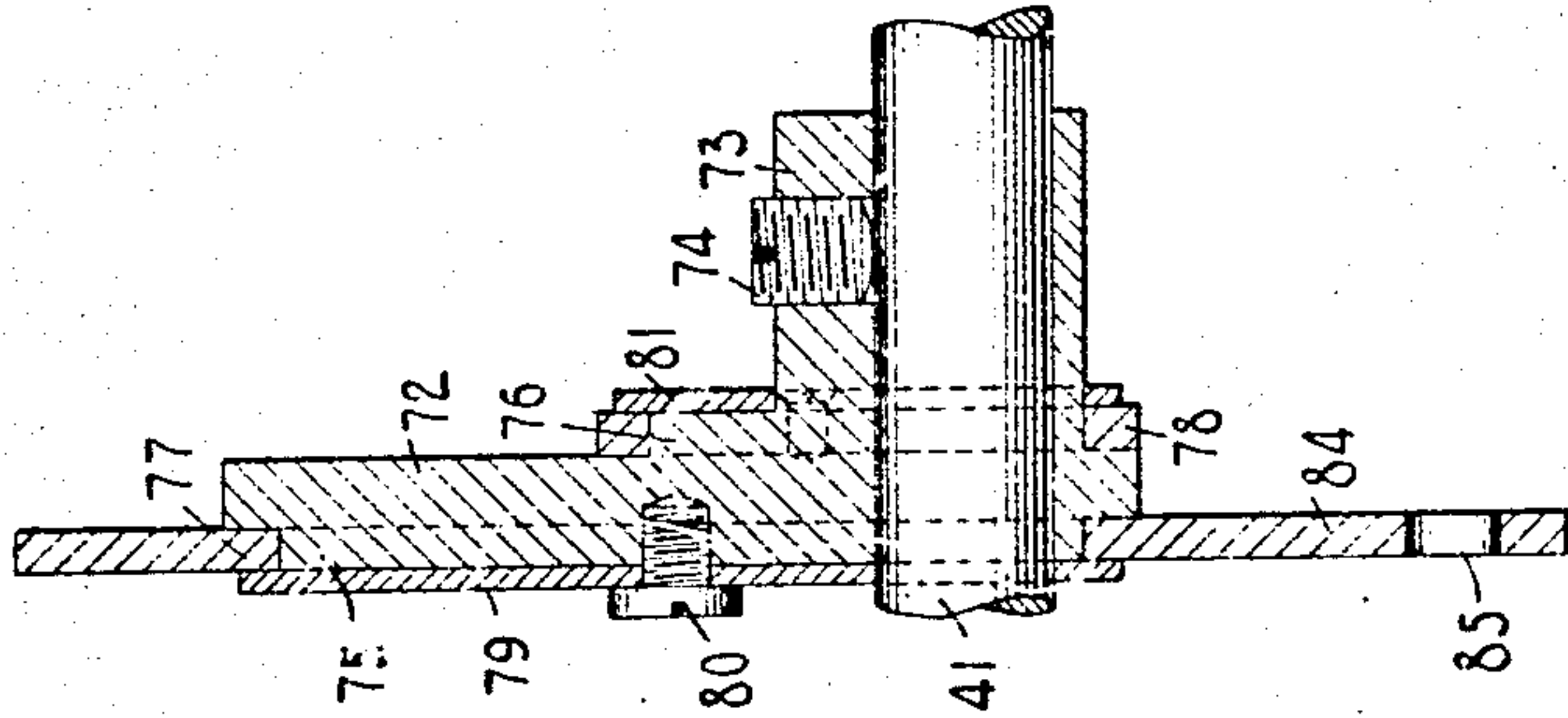


FIG. 6

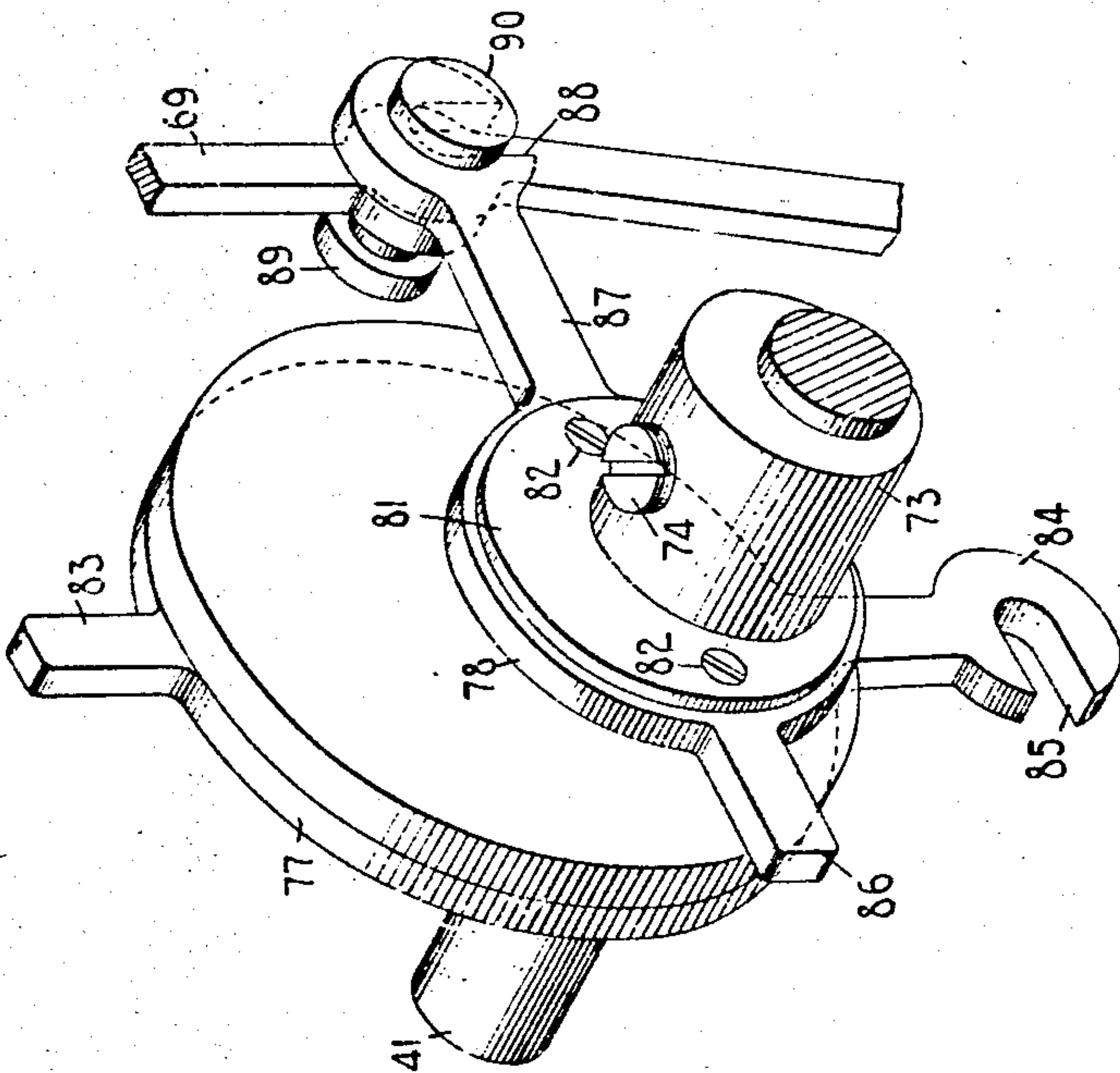


FIG. 5.

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7 SHEETS—SHEET 8.

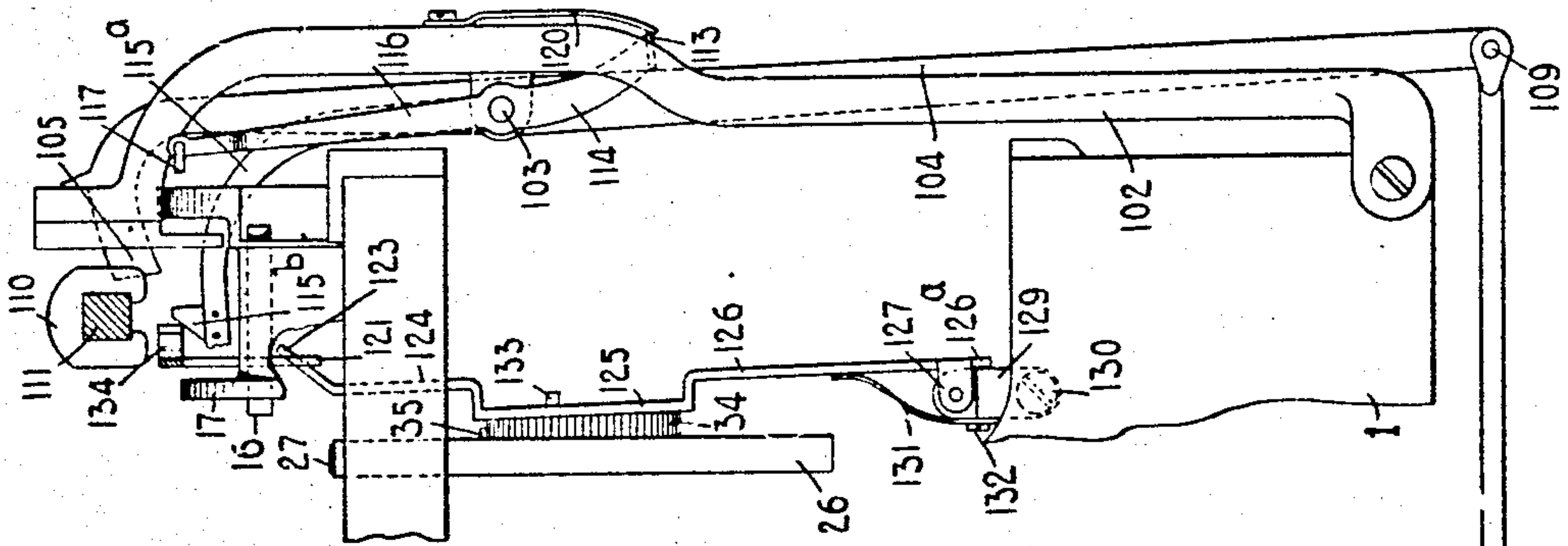


FIG. 7.

FIG. 10.

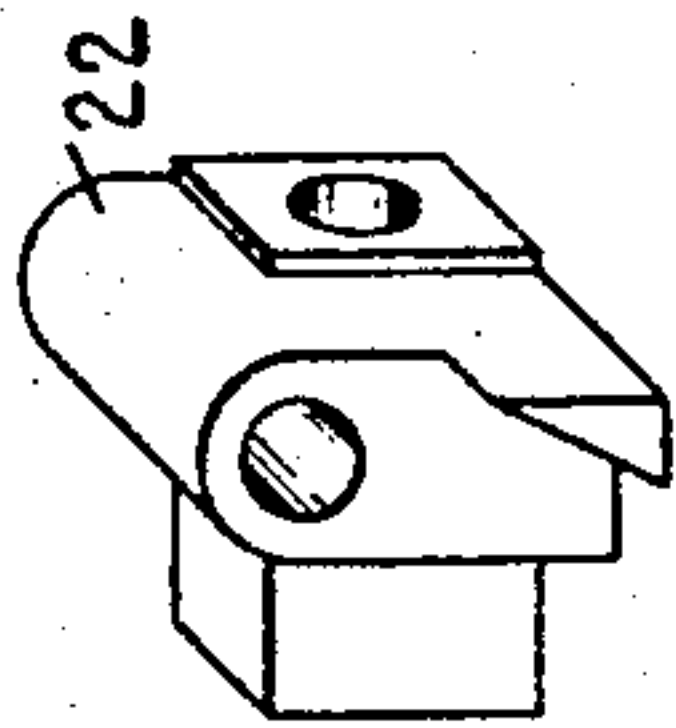


FIG. 11.

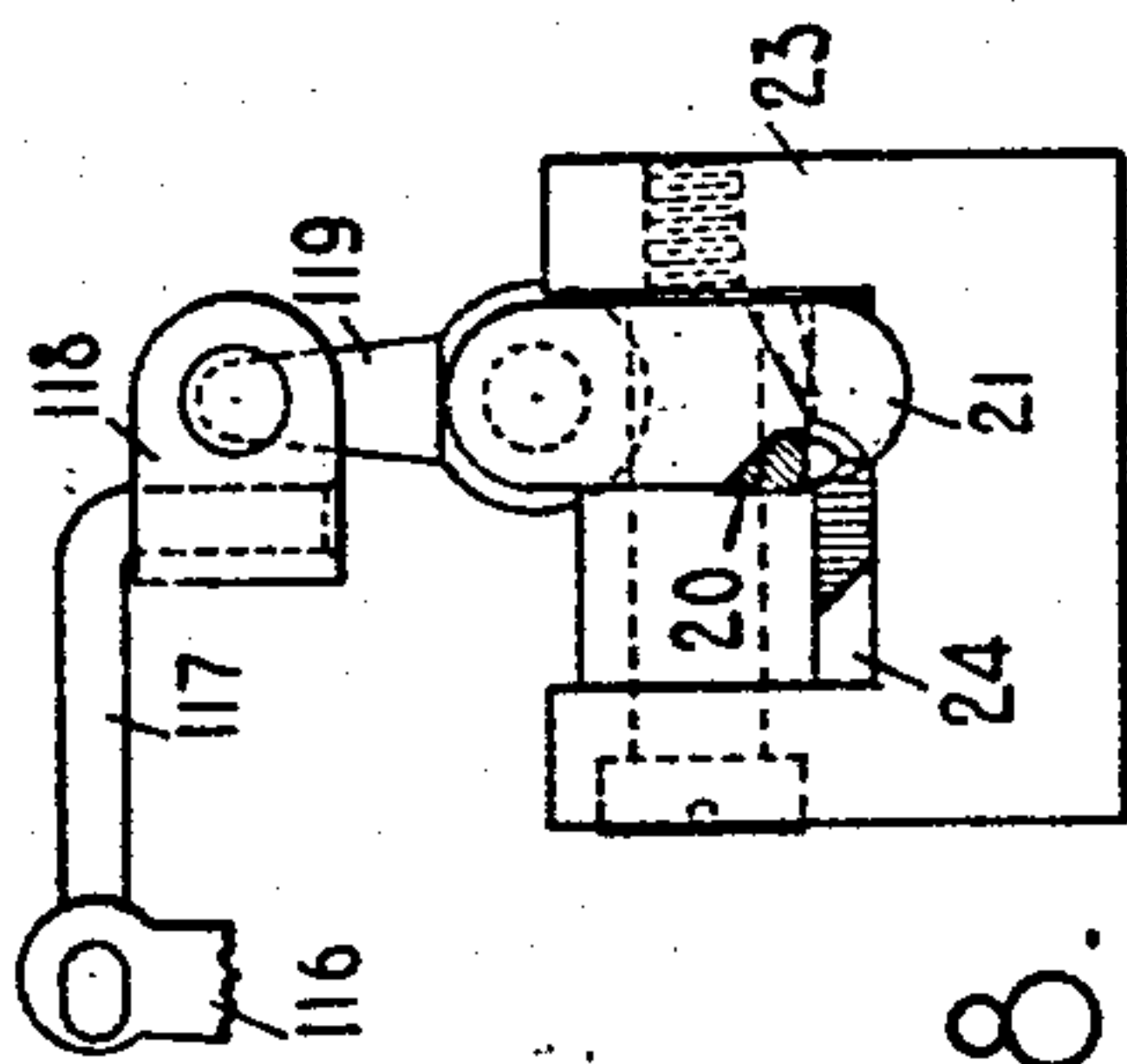
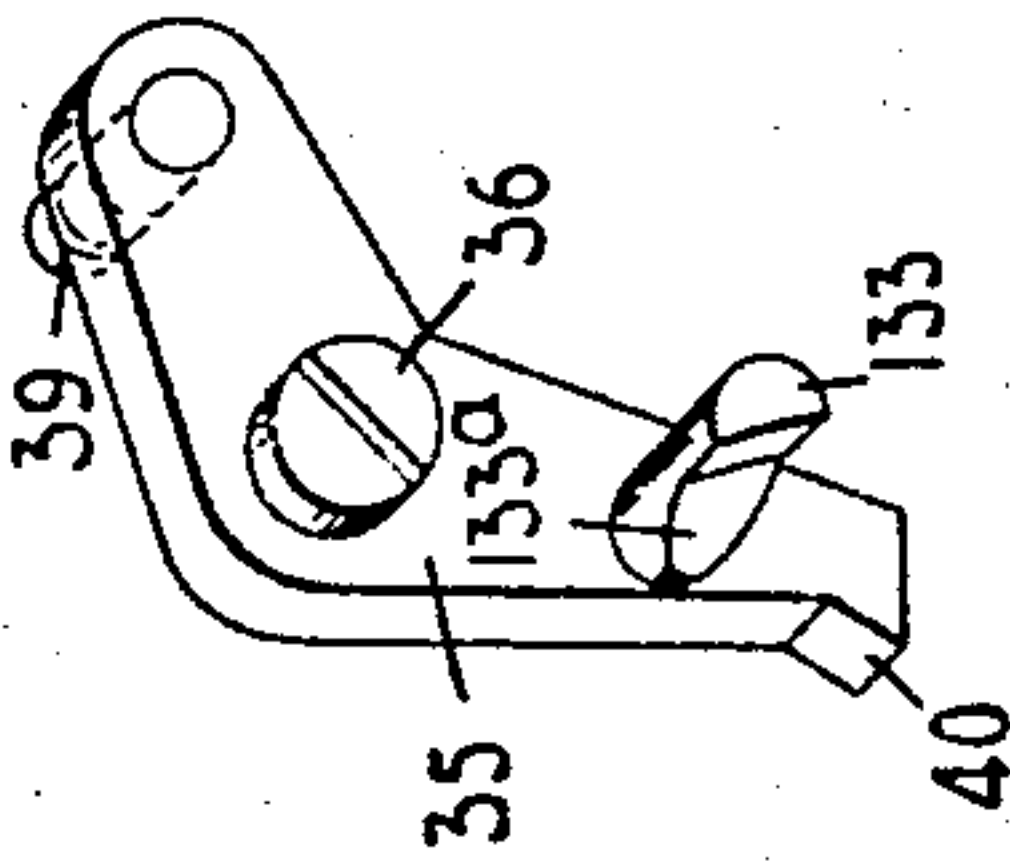


FIG. 8.

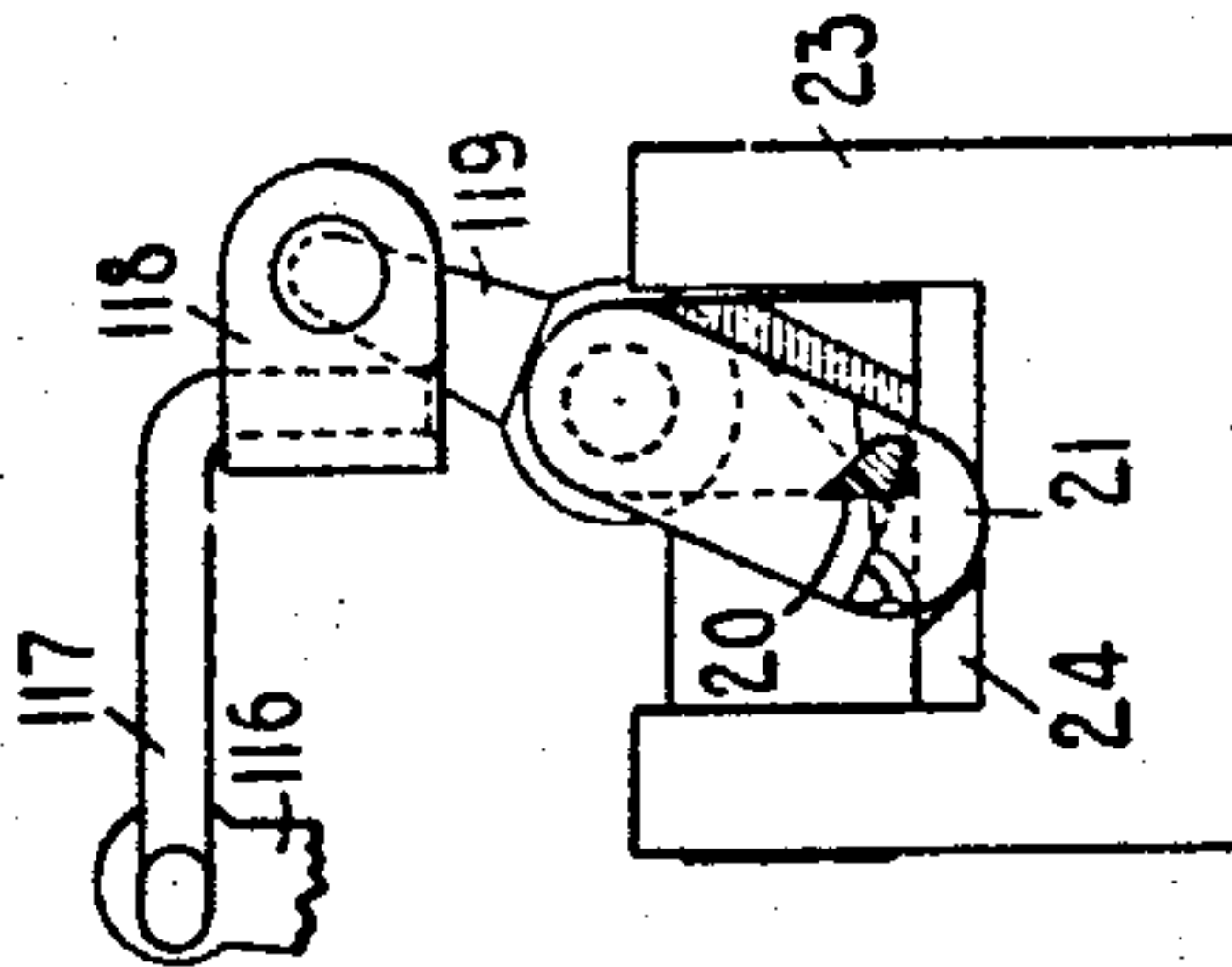
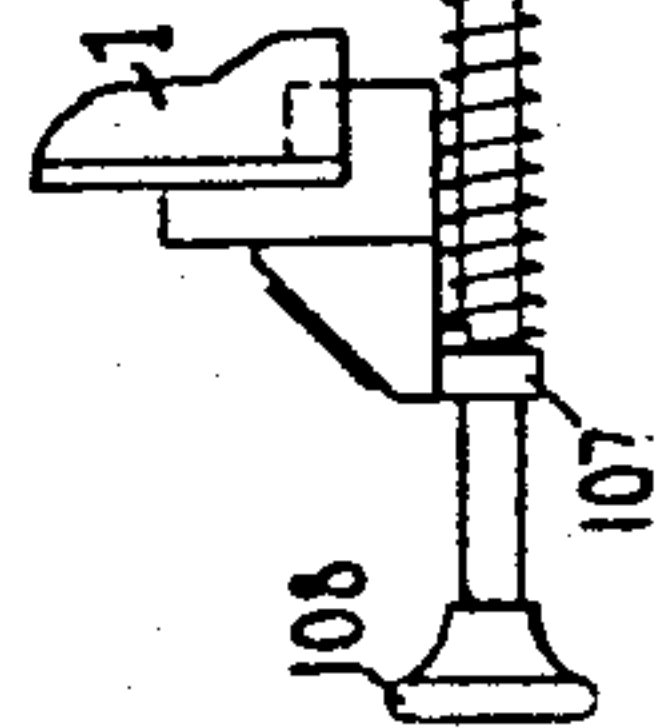


FIG. 9.



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7 SHEETS—SHEET 7.

959,696.

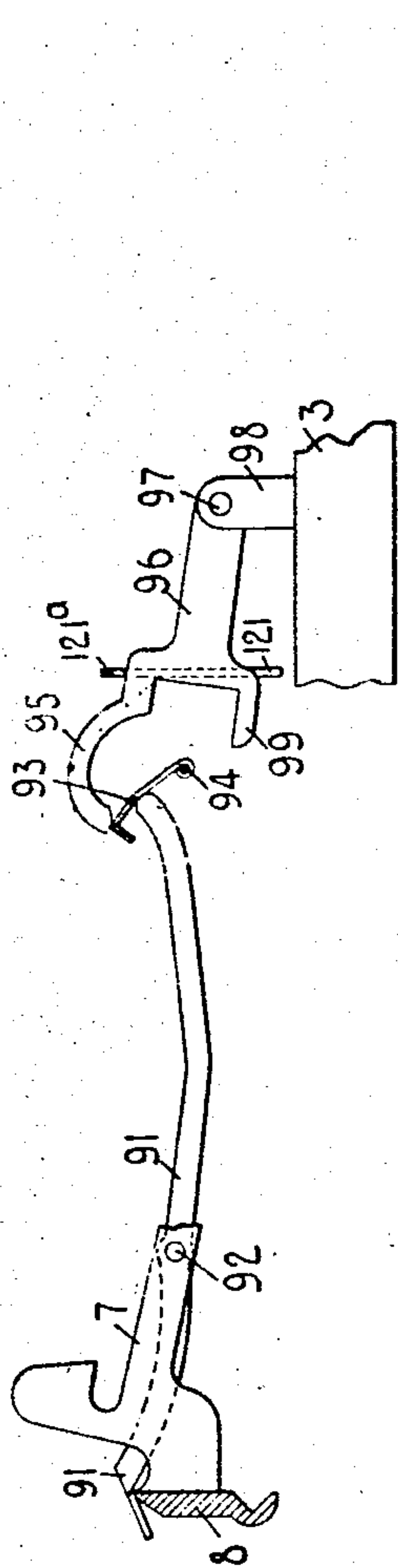


FIG. 12.

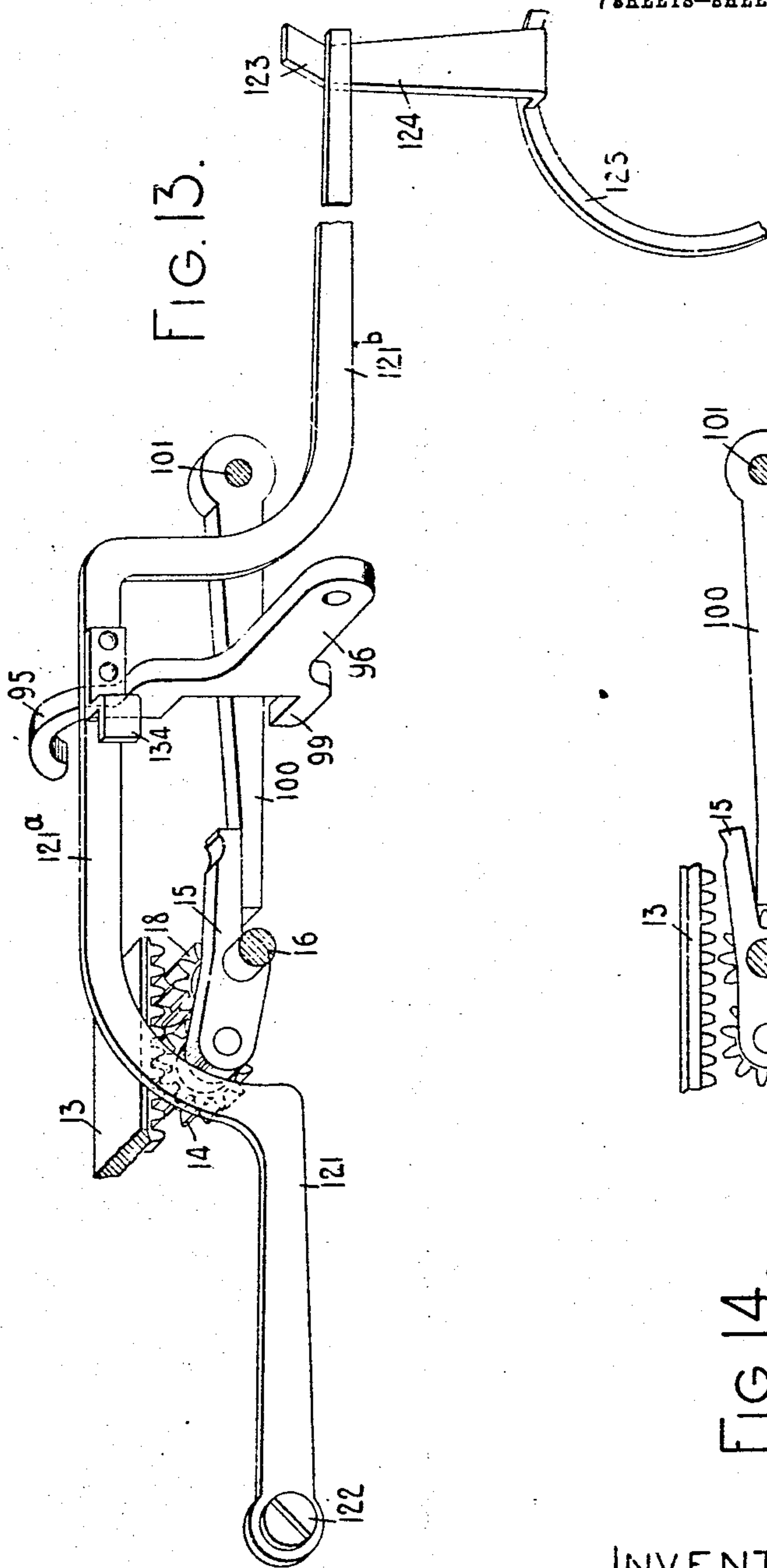


FIG. 13.

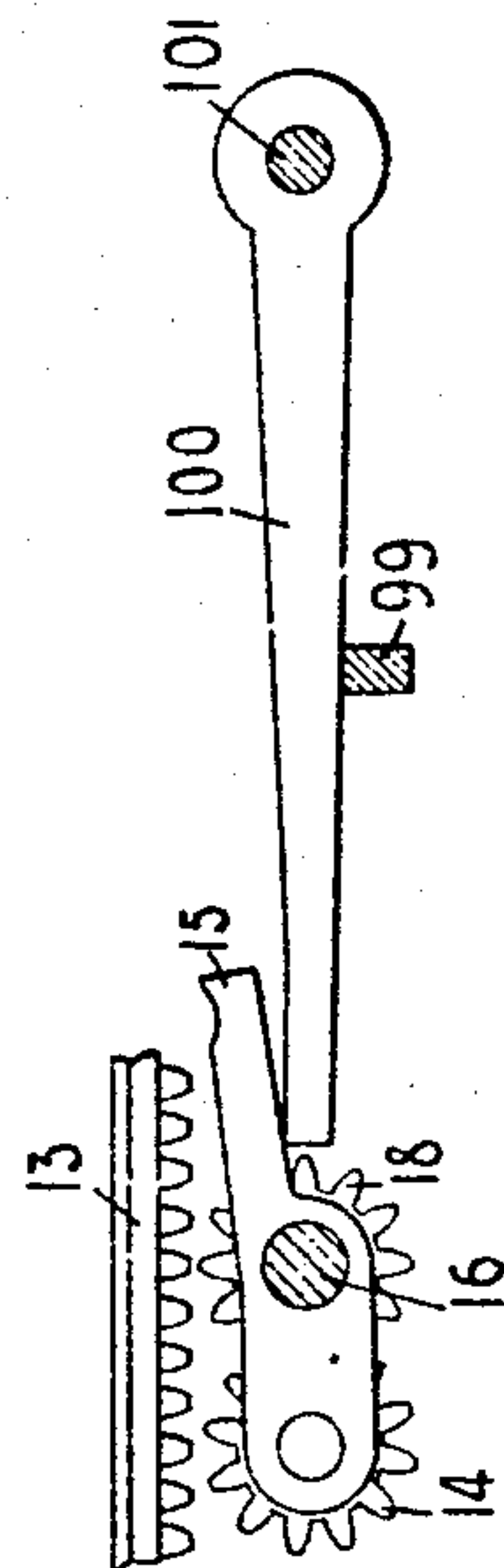


FIG. 14.

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UNITED STATES PATENT OFFICE.

WALTER J. BARRON, OF NEW YORK, N. Y., ASSIGNOR TO UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

959,696.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed April 29, 1908. Serial No. 429,996.

To all whom it may concern:

Be it known that I, WALTER J. BARRON, citizen of the United States, and resident of the borough of Brooklyn, city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates especially to ribbon mechanism for typewriting machines and its object generally stated is to provide improved mechanism of this class.

More specifically, one object of the invention is to provide automatic cross feeding devices for a ribbon which is controlled by a central ribbon guide which guides the printing portion of the ribbon crosswise of the printing line.

Another object is to provide interchangeable automatic cross feed devices, whereby the extent of cross feed may be varied.

Another object is to provide means for dispensing with the automatic cross feeding devices and for enabling the ribbon guide to be set in selected positions whereby the ribbon may be used in predetermined fields extending lengthwise of the ribbon.

Another object is to provide means operative automatically to cut out or render inoperative the longitudinal ribbon feeding mechanism when the carriage is released from its letter feeding devices, said automatic means being operative both by the usual release key of the machine, and also by one or more tabulating keys.

Other objects will hereinafter appear.

To the above ends, my invention consists in the features of construction, combinations of devices and arrangements of parts hereinafter described and particularly pointed out in the claims.

My invention is especially adapted to the Smith Premier typewriting machine, which is an under-strike machine, and in the present instance I have shown the invention applied to that machine, but the nature of the invention is such that various of its features may be applied to other styles of writing machines.

In the accompanying drawings, Figure 1 is a fragmentary side elevation of so much of a No. 2 Smith Premier typewriting machine as is necessary to illustrate my invention. Fig. 2 is a rear elevation of the machine, parts being broken away and parts

omitted. Fig. 3 is a fragmentary top plan view of the machine with the carriage removed. Fig. 4 is a fragmentary front elevation partly in section showing the frame of the machine and part of my novel devices for automatically feeding the ribbon crosswise. Fig. 5 is an enlarged perspective view of certain of my novel crosswise feeding devices. Fig. 6 is a front to rear vertical sectional view of certain of the devices shown in Fig. 5. Fig. 7 is a fragmentary side elevation illustrating certain of my novel devices for cutting out or dispensing with the longitudinal ribbon feeding mechanism. Fig. 8 is a side elevation, viewed from the right, of the escapement dogs and part of the connections for releasing the carriage by the operation of the tabulating mechanism, a tooth of the escapement wheel being shown in section. Fig. 9 is a view similar to Fig. 8 but showing the parts in the positions they occupy when the carriage is released by the tabulating mechanism. Fig. 10 is a perspective view of the carrier of the loose dog of the escapement. Fig. 11 is a perspective view of the pawl which connects the carriage spring drum with the left-hand ribbon spool through a ratchet wheel thereon. Fig. 12 is a fragmentary vertical sectional view taken transversely of the platen carriage and showing the usual release key and associate parts and also part of my novel ribbon cut-out mechanism operated thereby, the platen being omitted. Fig. 13 is an enlarged perspective view showing parts of my novel ribbon cut-out mechanism and associate parts of the carriage releasing devices which are operative by the release key. Fig. 14 is a rear elevation, partly in section, showing certain of the parts illustrated in Fig. 13.

Referring first more especially to Figs. 1, 2 and 3, the main frame of the machine is shown as comprising a base 1, posts 2 and a top frame part or plate 3. A set of type bars (not shown) are circularly arranged on the top plate and are connected by the usual train of actuating devices (not shown) with finger keys 4. The type bars, when actuated, cooperate with the under side of a platen 5 having an axle 6 which is supported on the side bars 7 of a carriage, which carriage further comprises a front bar 8 and a rear bar 9. The front and rear bars are oppositely grooved to cooperate with anti-friction balls 10 which also cooperate with

grooved front and rear guide rails numbered respectively 11 and 12, said guide rails being fixed to the top plate. The rear bar 9 of the carriage carries a feed rack 13 provided at its under side with teeth which mesh normally with a pinion 14 pivoted on a lever 15, said lever being fulcrumed on a shaft 16, which shaft is journaled on a bracket 17 on the top plate. Fixed to the forward end of the shaft is a feed pinion 18 which constantly meshes with the pinion 14, said pinion 14 transmitting the motion from the carriage through the feed rack 13 to the pinion 18 and shaft 16. Said shaft at its rear end carries an escapement wheel 19 having teeth 20 which are adapted to cooperate with a loose dog 21 pivoted on a carrier 22 which in turn is pivoted on a carrier 23 carrying the fixed dog 24. The carrier 23 is secured to the upper end of a vertical rock shaft 25 journaled on the frame of the machine, the lower end of said rock shaft carrying an arm 25^a which connects with the usual universal bar or gate (not shown), said gate being operated when each of the printing keys 4 is depressed, so as to cause the escapement dogs 21 and 24 to cooperate with the teeth of the escapement wheel to permit the carriage to be drawn a letter space distance leftward by the carriage power. Said carriage power comprises a wheel 26 connected by a band or strap 27 with the carriage. Integral with the wheel 26 is a hollow drum 28 which contains the usual power spring, said drum being loosely mounted on a driving shaft 29 which extends fore and aft of the machine and is journaled in the left-hand front and rear posts 2. A ribbon spool 30 is loosely mounted on the driving shaft 29 just back of the front corner post and is held from movement lengthwise of said shaft but is adapted to be turned in unison therewith by devices comprising ratchet teeth 31 integral with the rear flange of the spool 30 and a sleeve 32 slidably mounted on the shaft 29 and provided with ratchet teeth 33 which are adapted to mesh with the ratchet teeth 31. The driving or ribbon spool shaft 29 is normally connected with the spring drum 28 by devices comprising a ratchet wheel 34 fixed to the rear end of the shaft 29 and a pawl 35, said pawl being pivoted between its ends to the spring drum 28 at 36. A coiled spring 37 is connected at one end by a screw 38 with one of the spokes of the wheel 26, said spring at its other end engaging a pin 39 on one arm of the pawl 35 and tending constantly to maintain the tooth 40 on the other arm of said pawl in engagement with the teeth of the ratchet wheel 34.

At the opposite side of the machine a ribbon spool shaft 41 is journaled on the right-hand posts 2 and carries adjacent to the rear post a ribbon spool 42, said spool being mounted so that it may turn independently of the

shaft 41, but being held from endwise motion therealong. The spool 42 is adapted to be connected to turn in unison with the shaft 41 by devices comprising ratchet teeth 43 integral with the front flange of said spool and cooperating ratchet teeth 44 formed on the rear face of a sleeve 45, which sleeve may be moved endwise of the shaft 41 but is connected to turn always in unison therewith. A crank arm 46 has a hub 46^a which is arranged on the rear end of the shaft 41 and is suitably fixed thereto. The shafts 29 and 41 are connected to turn in unison by a rod 47 which is loosely mounted on slotted brackets 48 depending from the top plate, said rod 47 terminating in spherical ends 49, one of which is detachably seated in a depression in the ratchet wheel 34 and the other in a depression in the crank arm 46. The usual or suitable reversing mechanism may be employed to move the sleeves 32 and 45 alternately into and out of connection with their associate ribbon spools so as to reverse the direction of longitudinal feed of the ribbon. By this alternate turning of the spools the ribbon is fed longitudinally back and forth across the printing point. This longitudinal feed of the ribbon is derived from the connection of the spring drum 28 with the driving shaft 29, said connection comprising the ratchet wheel 34 and the pawl 35, the pawl being the driver and the ratchet wheel the driven part. The nature of the connection is such that it is operated during the movements of the carriage from right to left across the top plate, but when the carriage is returned or restored in the opposite direction the pawl tooth 40 will slide idly over the teeth of the ratchet wheel 34 without affecting said ratchet wheel or the spool shafts.

The rear flange of the spool 30 is somewhat nearer the front of the machine than the front flange of the spool 42 and the ribbon 50 is directed from one of these spools to the other in an off-set path, being led upward from the spools through suitable slots in the top plate and thence directed inward toward the middle of the machine where it is turned or folded over oblique turning bars 51 carried on a slidable member or guide plate 52. The ribbon passes from above the spool 30 over the top plate, under the left-hand portion of the guide 52, up over the front turning bar 51 toward the rear of the machine, over the type opening between the two turning bars, over the rear turning bar, thence down under the right-hand side portion of the guide 52, over the top plate and down through the slot therein to the spool 42. The arrangement is such that the printing portion of the ribbon, or that portion between the turning bars and overlying the same, extends transversely or at right angles to the length of the platen and the lines

written thereon, and the longitudinal feed of this portion of the ribbon is also transverse of the lines of writing and of the direction of the longitudinal feed of the other portions of the ribbon between the spools. The printing point is indicated by the dotted square 53 in Fig. 3, and from an inspection of this figure it will be seen that the printing point lies back of the left-hand ribbon spool and in front of the right-hand ribbon spool and that the types will strike only the printing portion of the ribbon.

The guide plate 52 is mounted to slide on a guide bar 54 on the top plate at the rear side of the machine, the guide plate being provided with a lip 52^a so that it partially embraces the guide bar 54. The guide plate 52 at its front side coöperates with a second guide bar 55 on the top plate, said guide plate at its front side being confined between the guide bar 55 and the under side of the front rail 11. The guide bar is provided with fingers 52^b which extend downward through a slot 56. It will be understood that the guide plate 52 is adapted to be moved lengthwise of the guide bars to present different widthwise parts of the printing portion of the ribbon to the types. This movement of the guide plate may be accomplished by hand as in the Smith Premier machine or automatically as provided for by my present invention. The parts thus far specifically described are or may be the same as the corresponding parts of the No. 2 Smith Premier typewriter, and it is therefore not deemed necessary to describe them in greater detail. The guide plate 52 has a forwardly extending part 52^c on which is pivoted at 57 an angled member or part 58 provided with a finger piece 59 and a rearwardly projecting lug 60. The part 58 is confined between the top of the machine frame and a guide bar 61 secured thereto by screws 62. The guide bar 61 is provided with a lug 61^a having a concave face 61^b which is adapted to coöperate with the finger piece 59 when the guide 52 is moved leftward to render the ribbon inoperative. The front end of the part 58 is beveled to provide a pointer which coöperates with an indicating plate 63.

The ribbon mechanism thus far described may be employed with a ribbon of uniform character throughout, but is especially adapted for use with a ribbon divided longitudinally into a plurality of fields or stripes of different characteristics; such, for example, as the ribbon 50 illustrated in the drawings which shows two narrow fields *a* and *b* at the opposite edges of a wider central field *c*. Of course, the ribbon may be divided into a greater or less number of fields at pleasure and these fields may differ in various respects. For the sake of illustration the field *a* of the ribbon 50 may be assumed to be colored red, the field *b* to be colored black

with an ink such as is used for record work, and the field *c* to be colored with purple copying ink. When a ribbon like that just described has been heretofore employed in the No. 2 Smith Premier machine, said ribbon has been usually adapted to be written on in a single line lengthwise of the field *a*, in a single line lengthwise of the field *b*, and in a plurality of parallel lines or paths lengthwise of the broader field *c*. In the case of the fields *a* and *b*, after they have once been set in the position for use by adjusting the guide 52, there is no further adjustment of said guide made as long as the field *a* or the field *b* is being employed; but in the case of the field *c*, after it has been written throughout its length in one line or path, the guide 52 may be adjusted to a new position and the ribbon may be reversed and the field *c* used in another line or path parallel to the first line or path; and so on until the entire width of the field *c* has been thus used. By my present invention I provide for using a ribbon like 50 in a line or path lengthwise of the field *a* and in a line or path lengthwise of the field *b*, the guide 52 being set for either field and held in set position by the friction between the guide and its guide bars 54 and 55. When, however, the broader field *c* is to be employed, I provide means for automatically reciprocating the guide 52 from side to side so that the ribbon is fed crosswise back and forth from one edge of the field *c* to the other simultaneously with the longitudinal feed of said ribbon, the result being that the types will follow a serpentine path extending lengthwise of the field *c* and curving substantially from one edge to the other thereof. When the ribbon 50 is replaced by a ribbon of uniform character throughout its width, my invention enables the extent of the automatic reciprocatory movements of the guide 52 to be increased so that the ribbon may be fed crosswise to the full extent of its width and the serpentine path will wave or curve substantially from one edge to the other thereof.

The automatic means for sliding the guide plate 52 to and fro, comprises an arm 64 (Figs. 1, 3, 4 and 5) pivoted at 65 to the guide plate 52 and extending horizontally over the latter toward the right hand side of the machine. A leaf spring 66, secured to the guide plate by a screw 67, coöperates with the arm 64 and tends constantly to press it forward, the forward movement of the arm 64 being limited by the lug 60 on the part 58, which in turn is arrested by a lug 52^d integral with and extending forward and upward from the guide plate 52. The right-hand end of the arm 64 is beveled as indicated at 64^a and said arm is provided near its free end with a slot 68 which is adapted to engage the upper end of a vertically dis-

posed operating arm 69, said operating arm, as shown in Figs. 1 and 4, extending downward through an opening in the top plate near the right-hand side of the machine and being pivoted at 70 to a lug 71 extending inward from the right-hand side of the base 1. This operating arm is adapted to be swung on its pivot inward toward the middle of the machine and in the opposite direction by interchangeable devices which receive motion from the right-hand ribbon spool shaft 41. These devices are most clearly shown in Figs. 5 and 6 and comprise an eccentric carrier 72 which has a hub 73, the latter receiving a set screw 74 which engages the shaft 41 and secures the eccentric carrier in a fixed relation therewith. At its front side the eccentric carrier has formed integrally with it an eccentric 75, and at its rear side, a smaller eccentric 76. These eccentrics cooperate with suitable straps numbered respectively 77 and 78. The strap 77 is held in place by a plate 79 which is secured to the carrier 72 by a headed screw 80 and the strap 78 is similarly held in place by a plate 81 which is secured to the carrier by screws 82. The strap 77 is provided with a finger piece 83 and diametrically opposite thereto with an extension 84 formed with a slot 85. The smaller strap 78 is similarly provided with a finger piece 86 and an extension 87 formed with a slot 88. The slotted strap extensions 84 and 87 are adapted to cooperate one at a time with headed studs or pins extending oppositely from the front and rear faces of the operating arm 69 and numbered respectively 89 and 90. In the drawings the slot 88 of the extension 87 is shown engaged with its associate stud 90, thus rendering the strap 78 and the eccentric 76 operative, said strap and said eccentric cooperating during rotary movements of the shaft 41 to transmit a reciprocatory movement to the operating arm 69 and from it through the arm 64 to the carrier 52. The throw of the eccentric 76 is sufficient to reciprocate the guide 52 to an extent that will enable the field *c* of the ribbon to be moved automatically back and forth widthwise of the printing point so that substantially the full width of said field may be employed.

If it be desired to dispense with the automatic cross feed and make use of either of the fields *a* or *b*, the arm 64 may be moved rearward on its pivot against the spring 66 until the slot 68 disengages from the upper end of the operating arm 69. This rearward movement of the arm 64 may be accomplished by pressing rearward on the finger piece 59, causing the lug 60 to turn the arm 64 on its pivot against the spring 66 until disconnection from the operating arm 69 is effected, after which the finger piece 59 may be used to slide the guide plate 52 to the proper position for using either the

field *a* or the field *b*, said guide remaining set in the position to which it has been moved by hand by reason of the frictional engagement of the guide with the guide bars on which it is mounted.

If it be desired to entirely dispense with the use of the ribbon, the guide plate 52 may be moved leftward by hand until the stem of the finger piece 59 is seated in the depression 61^b. This movement of the guide is sufficient to leave the printing point uncovered so that mimeograph work may be done or the types may be cleaned, etc.

When it is again desired to connect the guide plate 52 with the operating arm 69 said guide may be slid either toward the right or toward the left to cause the slot 68 to reengage the upper end of said operating arm. If the slot 68 happens to be at the right of the upper end of the arm 69 the guide 52 is moved leftward so that the front edge of the arm 64 will slide along said operating arm until said arm is engaged by the slot owing to the pressure of the spring 66. If the free end of the arm 64 is at the left of the upper end of the operating arm 69, the guide 52 is slid rightward by hand until the bevel or cam edge 64^a contacts with the upper end of the arm 69, causing the arm 64 to be forced rearward until the slot 68 engages said operating arm.

If a ribbon of uniform character throughout be substituted for the polychrome ribbon 50 and it be desired to feed said uniform ribbon automatically substantially from one edge to the other thereof during the longitudinal feeding of said ribbon, the eccentric strap 78 may be disconnected from the operating arm 69 by pressing the handle 86 downward until the slot 88 disengages from the stud 90; and thereafter, by manipulating the handle 83, the slotted extension of the strap 77 may be caused to engage with its associate stud 89 on the operating arm. The throw of the larger eccentric 75 is of an extent to provide for feeding the ribbon crosswise substantially from one edge to the other thereof.

Of course if desired both the eccentric devices may be put out of operation and the guide 52 may be set entirely by hand, as heretofore.

Where, as in the present case, the longitudinal ribbon feeding mechanism is connected with and actuated by the carriage power or spring drum, it has usually happened heretofore that when the carriage is released from its escapement devices either by operating the usual release key, or a tabulator key or otherwise, and is drawn fully or impelled varying distances toward the left, the ribbon will be fed longitudinally corresponding distances. During such feeding of the ribbon the printing devices are inactive and consequently a section of

the ribbon, corresponding to the distance which the carriage jumps or is drawn freely, will pass the printing point without being used; that is, without receiving impressions from the types. As the ink in the ribbon becomes more and more extinct in use, these unused sections or patches become more apparent in the printed work, some of the characters being much darker than others, with the result that the writing has an irregular and patchy appearance. Furthermore, in machines of this character in which an automatic ribbon reversing mechanism is employed, it will sometimes happen that the end of a ribbon is reached during one of the jumps of the carriage, with the result that rapid movement thereof prevents the effective working of the ribbon reversing mechanism. I provide means for overcoming these defects by the employment of a cut-out mechanism which is operative automatically either by a release key or by a tabulating key, to cut out or render inoperative the devices for feeding the ribbon.

The release key and the devices controlled thereby may be briefly described. Said release key 91 (as shown in Figs. 1, 2 and 12) is pivoted at 92 on the left-hand side bar 7 of the carriage and extends toward the rear of the machine, terminating in a nose which coöperates with a releasing plate or bar 93, overlying the feed rack 13 and pivoted thereto on studs 94 at the ends of said rod. The bar 93 when raised by the release key, as shown in Fig. 12, acts on the upper fork 95 of an arm 96 which arm is pivoted at 97 to the upper end of a rock shaft 98. The lower fork 99 of the arm 96 underlies an arm 100 (Figs. 2, 3, 13 and 14), which is pivoted at 101 to the frame of the machine and coöperates with the lever 15 at the opposite side of the shaft 16 from the pinion 14. When the forward end of the release key 91 is depressed the nose at the rear end thereof swings the bar 93 up to the position shown in Fig. 12, said bar 93 lifting the arm 96 and causing the lower fork 99 thereof to raise the arm 100, said arm 100 in turn swinging the lever 15 on the shaft 16 until the pinion 14 disengages from the carriage feed rack (Fig. 14) by freeing the carriage so that said carriage may be moved uninterruptedly leftward under the pull of the spring drum. The releasing mechanism just described was not invented by me and is not claimed *per se* herein.

I have illustrated (Figs. 1, 2, 3 and 7) a denominational tabulating mechanism which need be but briefly described as it was not invented by me nor is it claimed *per se* by me. The tabulating mechanism comprises a frame 102 which is detachably secured at the rear of the machine frame and which pivotally supports at 103 a set of vertically

disposed blades or levers 104 carrying denominational stops 105 at their upper ends. Said levers are adapted to be actuated to project the stops 105 forward by push rods 106 underlying the base of the machine and extending fore and aft thereof, said push rods each bearing near the front of the machine in a detachable bearing member 107 and terminating in a finger button 108, the rear end of each push rod being pivotally connected at 109 to one of the blades 104. The stops 105 are adapted to coöperate with one or more column stops 110 on a rack bar 111 supported on brackets 112 detachably secured to the carriage. In order to automatically release the carriage when any one of the stop blades 104 is operated, a universal bar 113 is arranged transversely behind the stop blades and below the pivots thereof, said universal bar being supported on arms 114 and 115 which extend upward and are pivoted at 103. The arm 114 is provided above the pivot 103 with an extension 116, said extension being connected by a link 117 with a block 118 which is pivoted on an arm 119 rising from the feed dog part 21 and integral therewith (Figs. 1, 2, 3 and 9). A leaf spring 120, acting against the universal bar 113, tends to maintain the latter in normal position as illustrated in Fig. 1. When one of the finger buttons 108 is pressed in, the corresponding blade 104 is swung on its pivot, projecting the associate denomination stop 105 into the path of the column stops 110, as shown in Fig. 7, and swinging the universal bar 113 rearward so that the extension 116 integral therewith is swung forward, and, through the link 117, operates to swing the loose dog 21 rearward on its pivot and out of the path of the teeth of the escapement wheel. Fig. 8 shows the normal position of the loose dog and Fig. 9 shows its position when released by the operation of the arm 116, link 117 and associate parts. The tabulating mechanism as thus far described was not invented by me.

The ribbon cut-out devices comprise a releasing arm 121 which is operative automatically both by the release key 91 and the tabulating mechanism. The releasing arm 121 is pivoted at 122 at the top and rear of the machine frame and extends from its pivot over the top plate toward the spring drum, being formed with an upwardly bent portion 121^a which overlies the fork 95 and is adapted to be operated thereby, (Figs. 1, 2, 7, 12 and 13). The left-hand end portion 121^b of the releasing arm normally rests on the top plate and the end thereof underlies the rearwardly inclined or cam end 123 of an extension 124 which is formed integral with and projects upward from a release ring or annulus 125. Said annulus is arranged concentrically with the ratchet wheel 34 and is of slightly greater diameter than

said ratchet wheel. Said annulus is supported on an arm 126 formed integrally therewith and extending vertically downward and diametrically opposite to the extension 124. Near its lower end the arm 126 is provided with forwardly projecting ears 127 which receive a pivot pin 128 supported on a block or bracket 129, said bracket being bifurcated to embrace the left-hand side of the base 1 and being detachably secured thereto by a screw 130. A leaf spring 131, secured to the block 129 by a screw 132, contacts with the front face of the arm 126 above the pivot 128 and tends constantly to maintain the member composed of the arm 126, annulus 125 and extension 124 in the normal position shown in Fig. 1. A lip 126^a integral with the arm 126 and extending below the pivot 128 is adapted to contact with the block 129 to limit the rearward movement of the member under the influence of the spring 131. From an inspection of Fig. 1, it will be seen that normally the annulus 125 is in a plane behind a plane containing the rear face of the ratchet wheel 34. As presently to be described the annulus-carrying member is adapted to be swung forward by the operation of the releasing arm 121 until it partly encircles the ratchet wheel 34, as shown in Fig. 7. During its forward movement the outer face of the annulus engages a pin or stud 133 fixed to and projecting rearward from the pawl 35 below the pivot thereof (Figs. 1, 2, 3, 7 and 11). As clearly shown in Figs. 3 and 11, the stud 133 is cut away to provide a cam face 133^a which face is acted on by the annulus in its forward swing to force the pawl 35 to turn on its pivot against the pull of the spring 37 and disengage the pawl tooth 40 from the teeth of the ratchet wheel 34, thereby disconnecting the carriage power from the ribbon mechanism. The pawl 35 and stud 133 being on the spring drum revolve in a circular path, but the annulus 125 having a corresponding circular face will cooperate with the stud 133 at any point in the path of revolution of said stud.

As clearly shown in Figs. 12 and 13 the bent portion 121^a of the releasing arm 121 overlies the fork 95 near the root or junction of said fork with the arm 96. When the release key 91 is operated to release the carriage from its step-by-step feeding devices, the fork 95 in its upward movement will contact with the bent portion of the arm 121 and will swing said arm upward on its pivot 122, causing the free end of said arm to engage with the cam 123, swinging the annulus carrying member forward on its pivot 128 and causing the annulus 125 at some point on its outer face to act against the cam 133^a to disconnect the pawl 35 from the ratchet wheel 34.

The arm 115 of the releasing frame of the tabulator is provided above the pivot 103 with an upwardly and forwardly curving extension 115^a, the end of said extension having suitably secured to it a cam plate 115^b which is adapted to contact with a bracket 134 riveted to the part 121^a of the releasing arm. When one of the tabulator keys 108 is operated the arm or extension 115^a is swung forward, causing the cam 115^b to engage with the lower edge of the outer end of the bracket 134, lifting the latter and through it swinging the releasing arm 121 upward on its pivot to act on the cam 123, causing the ratchet 125 to disengage the pawl 35 from the ratchet wheel 34, as previously described in connection with the operation of the release key 91.

It will be seen that the release key and the key controlled tabulating mechanism are operative independently of each other to release the carriage and cut out the ribbon. Further it will be noted that said release key and said tabulating mechanism are operative to release the carriage by breaking the train of carriage feeding devices at different points, the release key separating the feed rack and feed pinion while the tabulating mechanism separates the engaged dog from the escapement wheel.

Various changes may be made without departing from the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting machine, the combination with a platen, of ribbon mechanism comprising a movable guide which maintains the printing portion of the ribbon substantially at right angles to the printing line, means for feeding the ribbon longitudinally, and interchangeable means for reciprocating the guide different extents to impart different extents of cross feed to the ribbon.

2. In an under-strike typewriting machine, the combination with a platen, of ribbon mechanism comprising ribbon spools, a ribbon guide movable beneath the platen independently of said spools, means for feeding the ribbon longitudinally, and interchangeable means for reciprocating the guide different extents to impart different extents of cross feed to the ribbon.

3. In a typewriting machine, the combination with a carriage, carriage driving means and a platen, of ribbon spools, connections between said ribbon spools and said carriage driving means for turning the spools to feed the ribbon longitudinally, a ribbon guide which guides the printing portion of the ribbon transversely of the printing line, and means connecting said guide with said carriage driving means for automatically reciprocating said guide independently of said

spools to feed the ribbon crosswise, said connecting means including interchangeable devices for varying the extent of cross feed.

4. In an under-strike typewriting machine, the combination with a carriage, carriage driving means and a platen, of ribbon spools, connections between said ribbon spools and said carriage driving means for turning the spools to feed the ribbon longitudinally, a ribbon guide mounted to slide on ways beneath the platen, and means connecting said guide with said carriage driving means for automatically reciprocating said guide independently of said spools to feed the ribbon crosswise, said means including interchangeable devices for varying the extent of the cross feed.

5. In a typewriting machine, the combination of a platen, ribbon spools, means for turning the ribbon spools to feed the ribbon longitudinally, a ribbon guide which guides the printing portion of the ribbon transversely of the printing line, and connections between said guide and said ribbon spool-turning means for moving the guide lengthwise of the printing line, said connections comprising an arm pivoted on said guide and provided with a slot, an operating arm pivoted on the machine frame and adapted to engage the slot in the first recited arm, a spring for maintaining said arms engaged, and an eccentric device operative on said operating arm.

6. In a typewriting machine, the combination of a platen, means for feeding a ribbon longitudinally, a ribbon guide, disconnectible connections between said guide and said means, said connections comprising a spring pressed arm pivoted on said guide and a reciprocatory operating arm, and a part pivoted on said guide and provided with a finger piece, said piece cooperating with a stop on said guide to normally position the first recited arm and being movable by said finger piece to disconnect the first recited arm from said operating arm.

7. In a typewriting machine, the combination of a platen, ribbon spools, means for turning the ribbon spools to feed the ribbon longitudinally, a ribbon guide which guides the printing portion of the ribbon transversely of the printing line, and connections between said guide and said ribbon spool-turning means for moving the guide lengthwise of the printing line, said connections comprising an arm pivoted on said guide, an operating arm pivoted on the machine frame and connected with the first recited arm, and interchangeable eccentric devices cooperative with said operating arm to reciprocate it varying extents.

8. In a typewriting machine, the combination of a platen, ribbon spools, means for turning the ribbon spools to feed the ribbon longitudinally, a ribbon guide which guides

the printing portion of the ribbon transversely of the printing line, and connections between said guide and said ribbon spool-turning means for moving the guide lengthwise of the printing line, said connections comprising an arm pivoted on said guide, an operating arm pivoted on the machine frame and connected with the first recited arm, an eccentric rotatable by one of said ribbon spools, a cooperating strap and connection between said strap and said operating arm.

9. In a typewriting machine, the combination of a platen, ribbon spools, means for turning the ribbon spools to feed the ribbon longitudinally, a ribbon guide which guides the printing portion of the ribbon transversely of the printing line, and connections between said guide and said ribbon spool-turning means for moving the guide lengthwise of the printing line, said connections comprising an arm pivoted on said guide, an operating arm pivoted on the machine frame and connected with the first recited arm, a plurality of eccentrics of different throws rotatable with said ribbon spool-turning means, straps cooperating with said eccentrics, and means for connecting any selected one of said straps at will with said operating arm.

10. In a typewriting machine, the combination with a platen, of a ribbon mechanism comprising ribbon spools, a movable guide, means for feeding the ribbon longitudinally, interchangeable means for reciprocating the guide different extents independently of said spools to vary the extent of cross feed of the ribbon, and means for disconnecting said interchangeable means from said guide and enabling said guide to be set in one or another of a plurality of predetermined positions.

11. In an under-strike typewriting machine, the combination with a platen, of ribbon mechanism comprising ribbon spools, a ribbon guide slidably mounted beneath the platen, means for feeding the ribbon longitudinally, interchangeable means for reciprocating the guide different extents independently of said spools to impart different extents of cross feed to the ribbon, and means for disconnecting said interchangeable means from said guide and enabling said guide to be set in one or another of a plurality of predetermined positions.

12. In a typewriting machine, the combination with a platen and means for feeding a ribbon longitudinally, of a ribbon guide setttable to enable the ribbon to be used in straight paths along both edge portions thereof, and means for at will automatically reciprocating said guide to feed the ribbon crosswise between said edge portions.

13. In a typewriting machine, the combination with a platen and means for feeding

a ribbon longitudinally, of a ribbon guide settable to enable the ribbon to be used in straight paths along both edge portions thereof, means for at will automatically reciprocating said guide to feed the ribbon crosswise between said edge portions, and other means for at will enabling the guide to be reciprocated to a greater extent to feed the ribbon crosswise throughout substantially its entire width.

14. In a typewriting machine, the combination of a platen, ribbon spools, spool shafts, means for turning said shafts to feed the ribbon longitudinally, a slidable ribbon guide, a spring-pressed arm pivoted thereon, an operating arm pivoted on the machine frame and engaging normally with said pivoted arm, studs oppositely disposed on said operating arm, a pair of eccentric straps each adapted to be connected with one of said studs, and a pair of eccentrics rigid with one of said spool shafts and engaged by said straps, said spring-pressed arm being adapted to be swung out of connection with said operating arm.

15. In a typewriting machine, the combination with a platen, of ribbon mechanism comprising ribbon spools, means for imparting a longitudinal feed to a ribbon, and interchangeable means for imparting to the ribbon crosswise feeds of different extents independently of said spools.

16. In a typewriting machine, the combination with a platen, of means for feeding an ink ribbon longitudinally, ribbon spools carrying said ribbon, and means for feeding said ribbon transversely to utilize the ribbon crosswise, said transverse feeding means including interchangeable devices for imparting to the ribbon different crosswise feeds independently of said spools.

17. In a typewriting machine, the combination with a platen, of ribbon spools, means for feeding the ribbon longitudinally, a guide for conducting the ribbon across the printing point, and means for reciprocating said guide independently of said spools to bring different widthwise portions of the ribbon to the printing point, said reciprocating means including interchangeable devices adapted to reciprocate said guide through different distances.

18. In a typewriting machine, the combination of a power driven carriage, carriage escapement devices, a release key on the carriage adapted to release the carriage from its escapement devices, a key-operated tabulating mechanism also operative to release the carriage from its escapement devices, a ribbon driving shaft, a pawl and ratchet connection between said driving shaft and the carriage power, and means operative both by said release key and by said tabulating mechanism independently of each other to separate said pawl and ratchet.

19. In a typewriting machine, the combination of a power driven carriage, carriage escapement devices, a release key for freeing the carriage from the control of said escapement devices, key-controlled tabulating mechanism also operative to free the carriage from control of its escapement devices, ribbon feeding mechanism connected with said power driven carriage, and means operative both by said release key and by said tabulating mechanism independently of each other to break the connection between said ribbon mechanism and said carriage.

20. In a typewriting machine, the combination of a power driven carriage, carriage escapement devices, a release key adapted to disconnect at one point certain of said escapement devices to release the carriage, a key operated tabulating mechanism which is further operative to disconnect at a different point certain other of said escapement devices to release the carriage, a ribbon feeding mechanism operated by said carriage, and means operative by said release key and by said tabulating mechanism to disconnect said ribbon feeding mechanism from said carriage.

21. In a typewriting machine, the combination of a power driven carriage; carriage escapement devices including a feed rack, a feed pinion, an escapement wheel and co-operating dogs; a release key operative to separate said rack and pinion to release the carriage; a key operated tabulating mechanism which is further operative to disconnect the normally operative one of said dogs from said escapement wheel; a ribbon driving shaft; a pawl and ratchet connection between said driving shaft and the carriage power; and means operative by said release key and also by said tabulating mechanism to break said pawl and ratchet connection.

22. In a typewriting machine, the combination of a power driven carriage, carriage escapement devices comprising a separable rack and pinion, a release key pivoted on the carriage, a bar pivoted on the carriage and operative by said key, a forked arm pivoted on the machine frame and operative by said bar, devices operative by said forked arm to separate said rack and pinion, a carriage spring drum, a spring pressed pawl thereon, ribbon feeding mechanism including a driving shaft, a ratchet rigid on said shaft and engaged by said pawl, and co-operating arms pivoted on the machine frame, one of said co-operating arms being operative by said forked arm and the other of said co-operating arms operating on said pawl to disconnect it from said ratchet.

23. In a typewriting machine, the combination of a carriage, a carriage spring drum, tabulating mechanism including a universal frame, an extension on said frame, a cam on said extension, ribbon mechanism including

a driving shaft, a ratchet fixed on said shaft,
a pawl on said spring drum engaging said
ratchet, and two cooperating arms one of
said cooperating arms being operative by the
5 cam and the other of said cooperating arms
operating on said pawl to separate it from
said ratchet.

Signed at the borough of Manhattan, city

of New York, in the county of New York,
and State of New York, this 28th day of 10
April A. D. 1908.

WALTER J. BARRON.

Witnesses:

CHARLES E. SMITH,
E. M. WELLS.