

No. 837,131.

PATENTED NOV. 27, 1906.

G. A. SEIB.
TYPE WRITING MACHINE.
APPLICATION FILED JUNE 30, 1905.

5 SHEETS—SHEET 1.

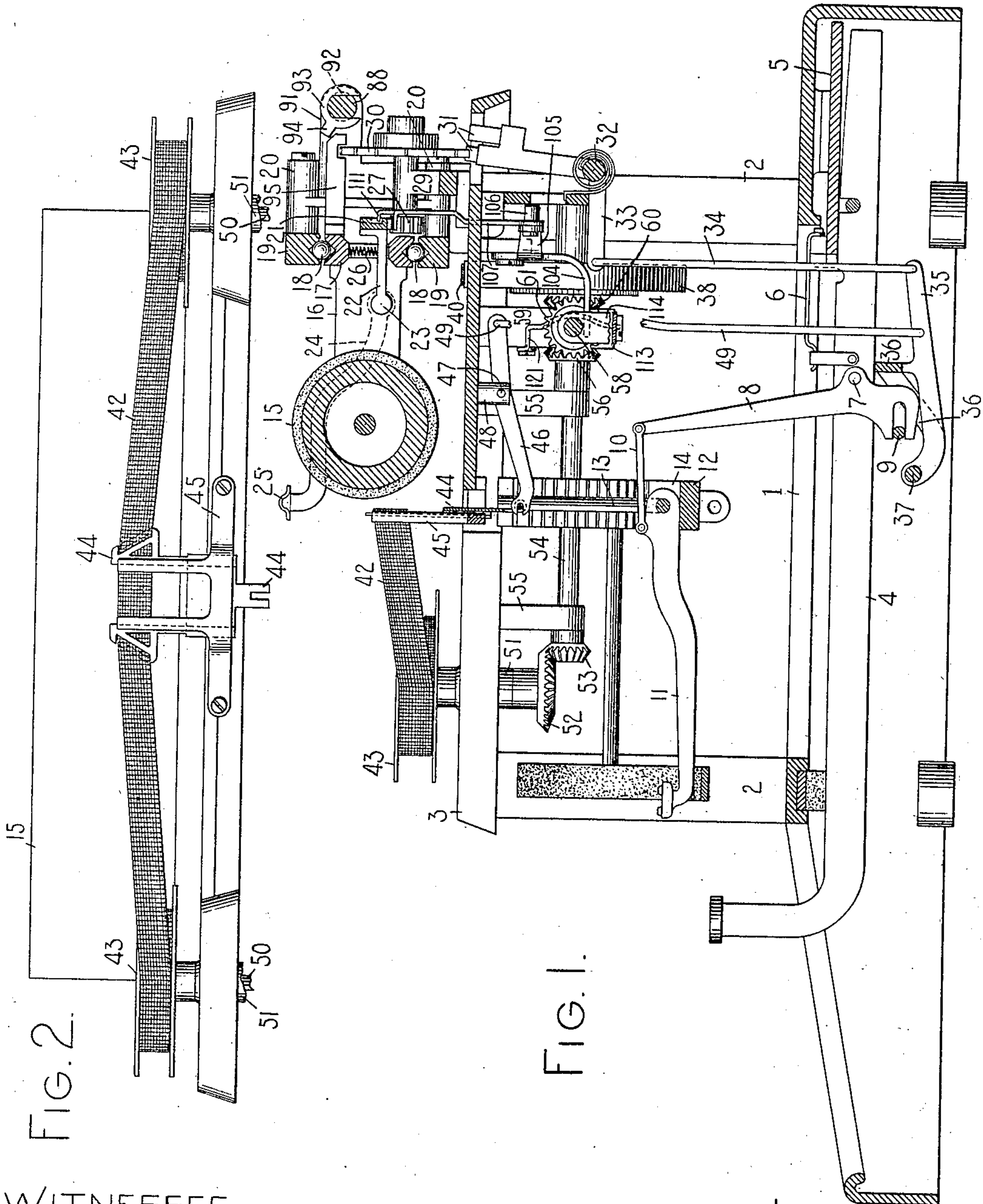


FIG. 2.

FIG. 1.

WITNESSES:

J. B. Reeves.
Wm. Pool

INVENTOR.

George A. Seib
By Jacob Felbel

HIS ATTORNEY

No. 837,131.

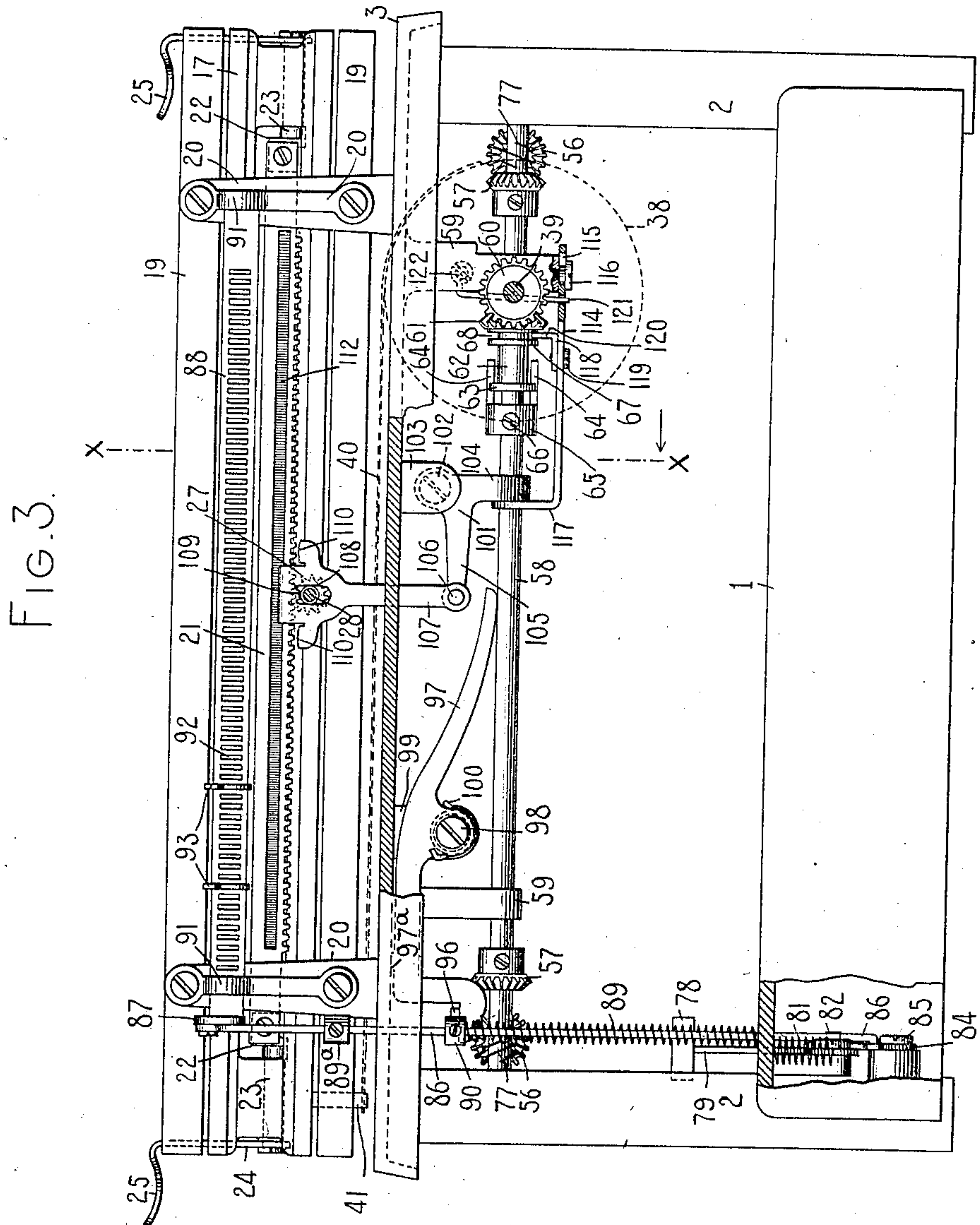
PATENTED NOV. 27, 1906.

G. A. SEIB.

TYPE WRITING MACHINE.

APPLICATION FILED JUNE 30, 1905.

6 SHEETS--SHEET 2.



WITNESSES.

INVENTOR.

George A. Seib

By Jacob Feltel

HIS ATTORNEY

J. B. Reeves.
New Pool

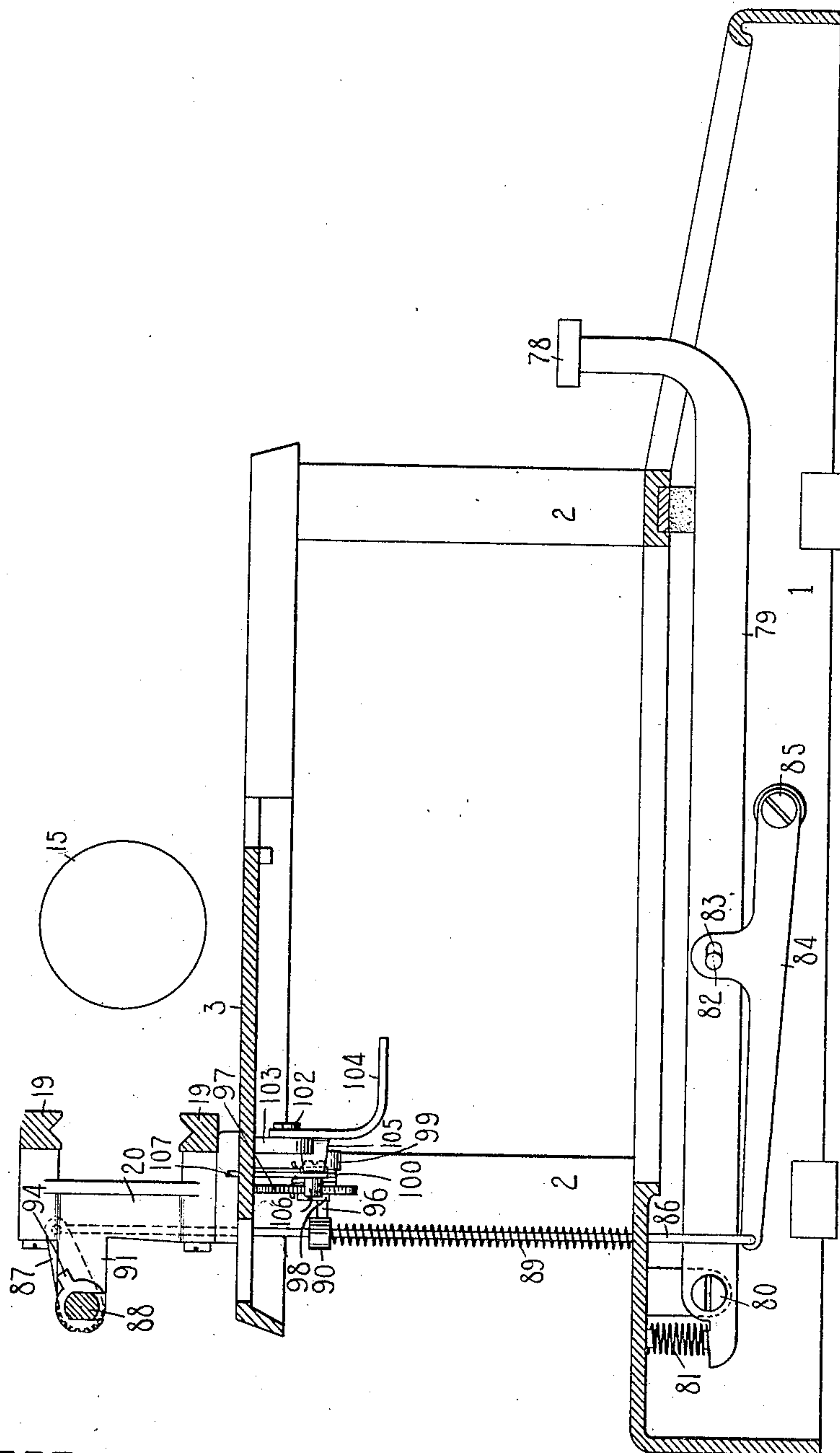
No. 837,131.

PATENTED NOV. 27, 1906.

G. A. SEIB.
TYPE WRITING MACHINE.
APPLICATION FILED JUNE 30, 1905.

5 SHEETS—SHEET 3.

FIG. 4.



WITNESSES.

J. B. Reeves.
W. W. Pool

INVENTOR.

George A. Seib
By Jacob Felber

HIS ATTORNEY

No. 837,131.

PATENTED NOV. 27, 1906.

G. A. SEIB.
TYPE WRITING MACHINE.
APPLICATION FILED JUNE 30, 1905.

5 SHEETS—SHEET 4.

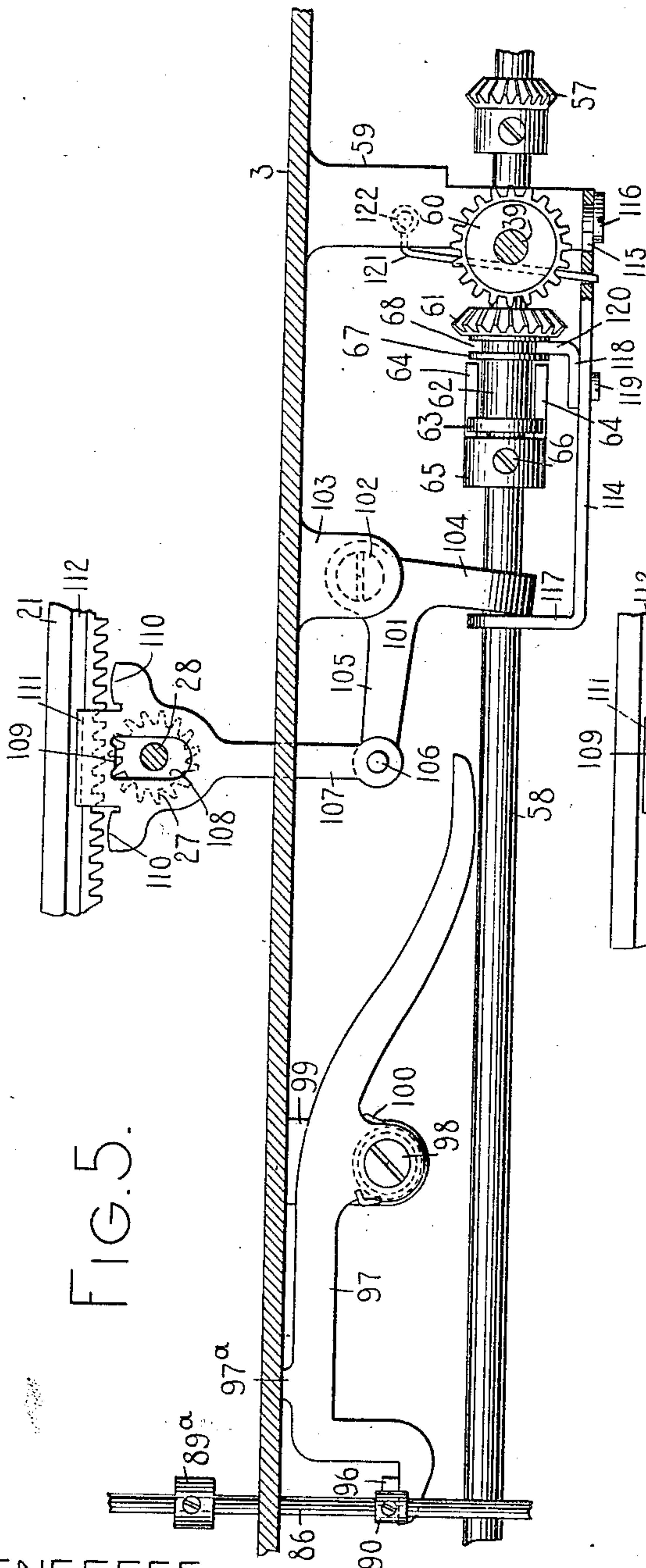


FIG. 5.

WITNESSES.

J. B. Reeves.
m.w. Pool

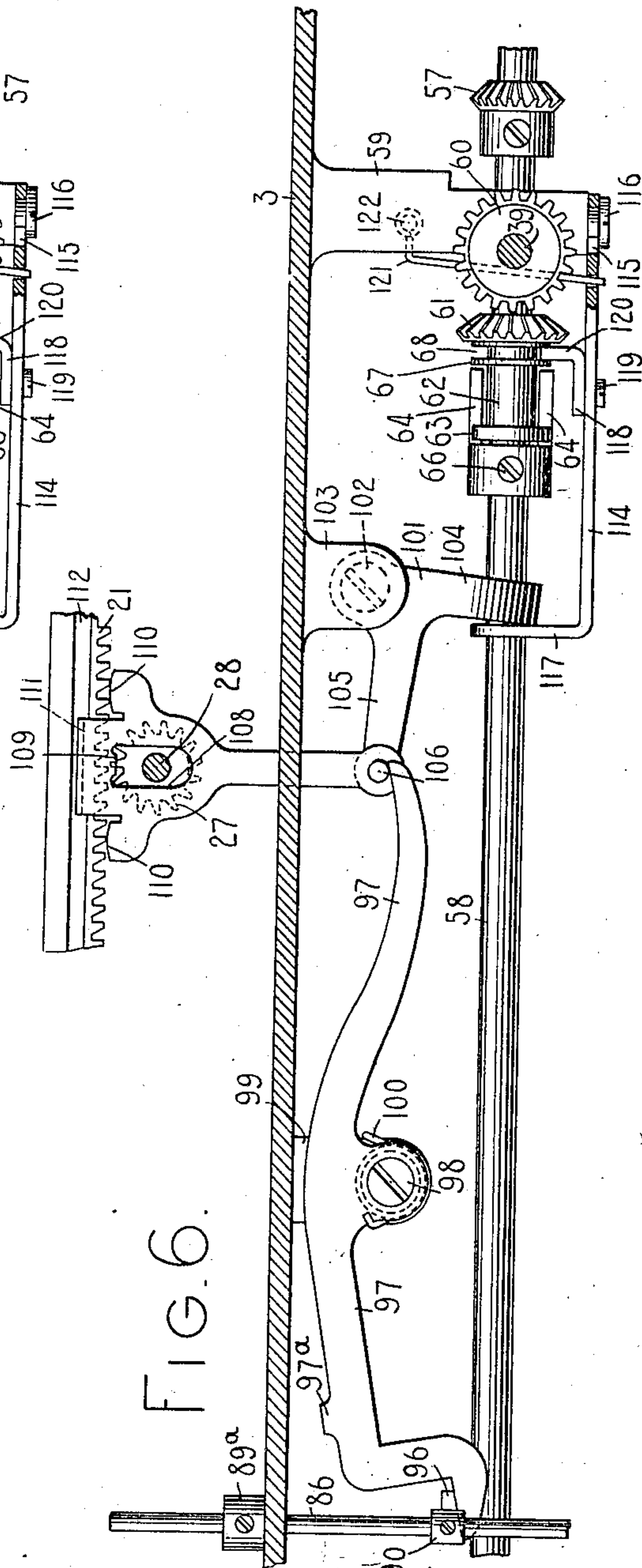


FIG. 6.

INVENTOR.

George A. Seib
By Jacob Felber

HIS ATTORNEY.

UNITED STATES PATENT OFFICE.

GEORGE A. SEIB, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE MONARCH TYPEWRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

No. 837,131.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed June 30, 1905. Serial No. 267,806.

To all whom it may concern:

Be it known that I, GEORGE A. SEIB, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga 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 to the ribbon-feeding mechanism of type-writing machines, more especially of that class of machines wherein the ribbon has connections with the means for driving or impelling the carriage.

In machines of the class referred to whenever the carriage is freed or released from the escapement devices either by actuating a release-key or a tabulator-key or otherwise and is drawn varying distances under the influence of the carriage-impelling device, which is usually in the form of a spring-drum, the ribbon, which has connections with the carriage-impelling device, will be fed corresponding distances. During the feed of the ribbon just described the printing devices are of course inactive, and consequently a portion or section of the ribbon, varying more or less with the distance which the carriage is "jumped" or drawn when freed from the escapement devices, will pass the printing-point without being used—that is, without receiving impressions from the types. The result is that as the ribbon becomes more and more exhausted in use these unused sections or patches of the ribbon become more apparent in the printing executed by the machine, some of the printed characters being much darker than others, and the type-writing consequently has an irregular and patchy appearance. Furthermore, in machines of the character referred to and in which the direction of the longitudinal feed of the ribbon is automatically reversed it sometimes happens that the end of the longitudinal feed in one direction is attained during one of the jumps or rapid movements of the carriage and that then the rapid movement of the carriage prevents the effective working of the reversing mechanism, and the ribbon is either stopped from feeding or is pulled or torn from the emptied spool.

The main object of my invention is to provide means to overcome these defects.

Other objects will subsequently appear.

To the above ends the invention resides in

the features of construction, arrangements of parts, and combinations of devices hereinafter described in detail, and particularly pointed out in the claims.

I have shown the preferred construction of my invention as applied to a machine having the general characteristics of the type-writing machine commercially known as the "Monarch" type-writer; but it is to be understood that my improvements may be embodied in any other kind or style of writing-machine which is available for the purpose.

In the accompanying drawings, Figure 1 is a vertical front-to-rear sectional view taken about centrally of so much of a type-writing machine as is necessary to a clear understanding of the invention. Fig. 2 is a fragmentary front elevation of the upper part of the machine with certain of the parts omitted. Fig. 3 is a rear elevation of the machine, parts being omitted and other parts being broken away. Fig. 4 is a sectional view taken on a plane represented by the line *x x* in Fig. 3, certain of the parts being omitted. Fig. 5 is an enlarged fragmentary rear elevation, partly in section, showing parts of the ribbon and disconnecting mechanisms. Fig. 6 is a view similar to Fig. 5, showing the same parts, but with some of them in different relations. Fig. 7 is a diagrammatic top plan view of the ribbon-feeding and ribbon-reversing mechanisms. Figs. 8 and 9 are diagrammatic views further illustrating the ribbon-feeding and ribbon-reversing mechanisms.

In the drawings the main frame of the machine comprises a base 1, corner-post 2, and a top plate 3.

4 is one of a series of key-levers fulcrumed on a fulcrum-plate 5 in the rear of the base, each key-lever being provided with a restoring-spring 6 and having pivoted on itself at 7 a sublever 8, which is slotted at its lower end to cooperate with a fixed abutment 9 and is connected at its upper end by a link 10 with a type-bar 11, which is one of a circularly-arranged series secured in any suitable manner to a segmental type-bar support 12. As herein shown, the type-bars are pivoted on a curved fulcrum-wire 13, which is seated in a groove in the top of the segmental support 12, and each type-bar is arranged in a radial slot 14, formed in said segment. The segment is adapted to be connected with

a shifting mechanism of known construction, (not shown;) but for the purposes of the invention it is immaterial whether the segment is of the shiftable or non-shiftable variety.

5 The type-bars 11 are adapted to cooperate with the front face of a platen 15, pivotally supported in the side bars 16 of a platen-carriage, which comprises besides said side bars a rear bar or rail 17, the latter being
10 grooved at the top and bottom to receive anti-friction-balls 18, which balls are also received in oppositely-disposed grooves in fixed guideways 19, the latter being secured to brackets 20, fixed to the top plate 3. A
15 feed-rack 21 is secured to the free ends of arms 22, which are fixed to the inner ends of short rock-shafts 23, having bearings in the side bars 16 of the platen-carriage. Fixedly secured to the outer end of each rock-shaft
20 23 is a forwardly and upwardly projecting arm 24, terminating in a finger portion or release-key 25. A spring 26 serves to maintain the feed-rack 21 normally in engagement with a feed-pinion 27, fixed to the forward end of a short shaft 28, the latter having its bearing in a bracket 29, secured to the top plate. An escapement-wheel 30 is fixedly
30 mounted on the rear end of the shaft 28 in position to cooperate with escapement-dogs 31, mounted in a pivoted dog-rocker 32, having an arm 33, which is connected by a link 34 with an arm 35, projecting rearwardly from a universal bar 36, which extends from side to side of the machine beneath the series of key-levers and is pivoted at 37 in the
35 sides of the base.

A spring-drum 38 is pivoted at 39 in a fixed part of the machine and is connected by a band or strap 40, with a pin 41, depending from the platen-carriage. The drum
40 through the strap 40 tends constantly to draw the carriage leftward across the machine, and when any key-lever 4 or the space-bar (not shown) is depressed the universal
45 bar 36 is swung downward, thereby through the link 34 rocking the dog-rocker 32 forward and permitting it on the return stroke of the key-lever to return to normal position. This vibratory movement of the dog-rocker
50 causes the escapement-dogs 31 to cooperate in a known manner with the escapement-wheel 30, which is connected through the feed-pinion 27 and feed-rack 21 with the carriage, and the latter is permitted to be drawn
55 one letter-space to the left by the spring-drum 38. When either of the release-keys 25 is depressed, the rock-shafts 23 are rotated in their bearings to swing the feed-rack 21 upward against the influence of the spring 26
60 until said feed-rack disengages from the feed-pinion 27. By this movement of the feed-rack the carriage is disconnected from its escapement mechanism, so that it may be moved rapidly leftward under the influence
65 of the spring-drum 38.

An ink-ribbon 42 is wound upon and has its ends secured to ribbon-spools 43, one mounted at each side of the machine above the top plate and forward of the platen. Centrally of the machine that part of the ribbon
70 between the spools is threaded through a ribbon carrier or vibrator 44, which is guided and supported in a guide-bracket 45, suitably secured to the machine-frame. The lower end of the vibrator 44 is pivotally connected with the forward arm of an operating-lever 46, fulcrumed at 47 in a lug 48, depending from the top plate, the rear end of said operating-lever being connected by a link 49 with the arm 35, fixed to the universal bar.
80 The construction is such that each time the universal bar is depressed under the influence of a key-lever 4 the vibrator 44 is caused to move upward in a known manner to interpose the ribbon between the platen and the
85 type or the end of the particular type-bar which is connected with the depressed key-lever.

Each ribbon-spool 43 is suitably secured at the top of a vertically-arranged shaft 50,
90 which extends downward from the top plate and turns in a fixed bearing 51. Fixed to the lower end of each vertical shaft 50 is a small beveled gear 52, which meshes with a beveled pinion 53, secured at the forward end
95 of a horizontal and rearwardly-extending shaft 54, having bearings in lugs 55, depending from the top plate. Fixed to the rear end of the shaft 54 is a beveled pinion 56, and adapted to cooperate therewith is a driving-
100 pinion 57, fixedly secured on a driving or power shaft 58, which extends from side to side of the machine beneath the top plate and is slidably mounted in fixed bearings 59. The driving-shaft 58 is connected with and
105 caused to rotate by the spring-drum 38 through beveled pinions 60 and 61, the first-named pinion being caused to rotate with the spring-drum in a known manner only when the latter turns to draw the carriage
110 leftward and the pinion 61 being so connected with the driving or power shaft 58 that the latter is caused to rotate with said pinion, but has endwise motion independently thereof.

For the purposes of my invention it is desirable to arrange the beveled pinion 61 so that it also shall have endwise motion independently of the driving-shaft 58. The preferred method of mounting the pinion 61 on
120 the driving-shaft is most clearly illustrated in Figs. 3, 5, and 6. Integral with the pinion 61 is a sleeve portion 62, which is perforated to permit the passage there-through of the driving-shaft 58, on which the
125 pinion 61 and the sleeve 62 are slidably arranged. The sleeve portion 62 terminates at the end farthest from the pinion in a flange 63, which is notched at the top and bottom to engage with fingers 64, extending right-
130

ward, as viewed from the rear, from a clutch member or collar 65, which is fixedly secured by a set-screw 66 to the driving-shaft 58. Near the pinion 61 the sleeve portion 62 is provided with two annular projecting portions or flanges 67. The flanges 67 serve to form, in effect, a groove-like portion or depression 68, the purpose of which will subsequently appear. The arrangement is such that the driving-shaft may be moved endwise, carrying with it the collar 66 and fingers or arms 64, or the pinion 61 and sleeve portion 62 may be moved endwise independently of the driving-shaft 58 and in a manner subsequently to be described. At all times, however, engagement is maintained between the driving-shaft 58 and pinion 61 through the arms 64 and the notched flange 63, so that whenever the pinion 61 is rotated it will transmit rotary motion to the driving-shaft 58.

It is to be understood that each ribbon-spool 43 is connected through a train of mechanism, as above described, with a beveled pinion 56. The beveled driving-pinions 57 are so arranged upon the power-shaft 58 that only one of said driving-pinions is engaged at a time with its associate pinion 56. To accomplish the alternate engagement of the driving-pinions 57 with their respective associated pinions 56, and thereby to cause the ribbon to wind from one spool to the other, and vice versa, the power-shaft 58 is caused to move endwise in any known manner. One means of causing this endwise movement of the driving-shaft is that shown in the United States patent to Jacob Felbel and Carl Gabrielson, No. 703,339, dated June 24, 1902.

In order not to complicate the drawings, the mechanism just referred to has been illustrated separately from the other devices and will be found diagrammatically shown in Figs. 7, 8, and 9, which will now be briefly described, the said Felbel and Gabrielson patent being available for a fuller and more detailed description. Referring to Figs. 7, 8, and 9, 69 designates an elbow-lever pivoted to the under side of the right-hand ribbon-spool 43 and retained for the greater part of the time in the position indicated in Fig. 8 by folds of the ribbon 42, which, it will be noted, with the parts positioned as shown in Fig. 7, is wound off the right-hand spool and on the left-hand spool. Until the right-hand spool is emptied the horizontal arm of the elbow-lever 69 serves to retain in non-working position a cam-plate 70, slidably secured to the under side of the spool 43. When the ribbon has been completely unwound from the spool, it releases the upright arm of the elbow-lever 69, thereby permitting the cam-plate to slide vertically downward to the position indicated in Fig. 9, in which position the cam-surface 71 is adapted

to engage with an upright pin 72, secured at one end of a horizontal spring-pressed lever 73, the other end whereof normally contacts with and presses rearwardly the upright arm 74 of a spring-pressed slide-rod 75. The rear end of the slide-rod is bent laterally and forwardly, terminating in a trip-pin 76, which normally is out of mesh with a worm 77, fixedly secured to the driving-shaft 58. As the ribbon-spool continues to rotate after the cam-plate 70 has dropped to operative position, the cam-face 71, acting upon the pin 72, cams the horizontal lever 73 against the pressure of its spring 73^a to the position indicated in Fig. 7, thereby allowing the slide-rod 75 to be moved forward by its spring 75^a until the trip-pin 76 engages with the worm 77. After this engagement takes place the driving-shaft 58 as it is rotated during the operation of the machine will be wormed along in the direction of the arrow in Fig. 7 until the right-hand driving-pinion 57 meshes with its associate pinion 56 and the corresponding left-hand pinions disengage, thereby reversing the longitudinal feed of the ribbon. As the ribbon begins to wind back on the right-hand spool it will press the upright arm of the elbow-lever 69 against the spool-core, restoring said lever, and with it the cam-plate 70, to the position indicated in Fig. 8. When the cam-plate 70 is moved upward, it releases the horizontal lever 73, permitting the latter to again act upon the slide-rod 75 to push said slide-rod rearwardly and to restore the trip-pin 76 to non-working position, the spring 73^a being strong enough to overcome the spring 75^a. It will be understood that the left-hand ribbon-spool is provided with a similar train of mechanism which will operate in a similar manner when said spool is emptied of the ribbon.

At the right-hand side of the keyboard, as best appears in Figs. 3 and 4, is a tabulating-key 78, carried by a key-lever 79, which is pivoted at 80 to a bracket secured to the frame of the machine, said key-lever being provided with a restoring-spring 81. The key-lever 79 carries a laterally-projecting pin 82, which extends into a slot 83, formed in a sublever 84, which is pivoted at 85 to a fixed part of the machine. The rear end of the sublever 84 is pivotally connected with an actuating-link 86, which extends upwardly from the sublever through an opening in the top plate and is pivotally connected at its upper end with a crank-arm 87, which is secured to the left-hand end of a rock-shaft or oscillatory stop-rod 88. A spring 89 surrounds the link 86 and, bearing at the lower end against the frame of the machine and at the upper end against a collar 90, secured to the link 86, tends to restore the link and the parts connected thereto to normal position, and a stop-collar 89 limits the downward movement of said link. The

stop rod or bar 88 extends in the direction of travel of the carriage and is supported in ears 91, projecting rearwardly from the brackets 20. The stop rod or bar 88 may be provided with a scale corresponding with the usual carriage-scale, and the front and back sides of the bar are serrated or notched, as indicated at 92, the serrations being adapted to receive detachable and adjustable stop members 93, having forwardly and upwardly projecting stop-lugs 94. Secured to the back rail 17 of the carriage is a rearwardly-projecting stop 95, which is adapted to coact with the stop-lugs 94 of the stop members 93, though said stop-lugs, as indicated in Fig. 1, are normally out of the path of movement of the stop 95.

Projecting inwardly and forwardly from the collar 90 on the actuating-link 86 is a pin or abutment 96, which coacts with the outer or, as viewed from the rear of the machine, left-hand hook-like end of a lever 97, pivoted at 98 to a lug 99, depending from the top plate. The lever 97 is provided with a stop-lug 97^a, which is normally maintained against the under side of the top plate 3 by a spring 100, coiled around the pivot 98. An elbow or bell-crank lever 101 is pivoted at 102 to a lug 103, depending from the top plate. One arm 104 of the lever 101 extends downwardly behind the driving-shaft 58 and then forwardly beneath the latter, and the other arm 105 projects toward the center of the machine and is offset rearwardly, being provided at its free end with a rearwardly-extending pin or abutment 106, which is above and in the path of the inner free end of the lever 97. A rack-lifter 107, perforated at its lower end to fit over the pin 106, extends upwardly through the top plate of the machine and is perforated at 108 to embrace the forward part of the shaft 28 and the bearing-bracket 29, which latter is somewhat cut away just back of the escapement-pinion 27. The top 109 of the perforation 108 bears normally against the brackets 29 and serves as a stop to limit the downward movement of the rack-lifter 107. At each side of the shaft 28 the rack-lifter 107 is provided with lifting-shoes 110, which project toward the front of the machine and stand normally beneath but out of contact with the teeth of the rack 21 and are slightly curved or convexed. The top of the rack-lifter 107 is bent horizontally and forwardly to form a broad lip 111, which enters a groove or depression 112 in the back of the rack 21 and extending longitudinally thereof.

The tabulating mechanism just described resembles generally that set forth in the patent to Carl Gabrielson, No. 784,317, dated March 7, 1905, although differing therefrom somewhat in detail, particularly in the construction of the carriage-releasing mechanism. Other constructions of tabulating

mechanism may, however, be employed with my invention. It will be understood that when the tabulating-key 78 is depressed adequately the stop-bar 88 through the sublever 84, link 86, and crank-arm 87 will be rocked forwardly until the stop-lugs 94 are in the path of the carriage-stop 95, and at the same time the pin 96 will depress the outer end of the lever 97, the inner end whereof, moving upward from the position shown in Fig. 3, will contact with the pin 106 and elevate the rack-lifter 107, causing the shoes 110 first to contact with the teeth of the rack 21 and then to swing the latter upward out of engagement with the feed-pinion 27 to the position indicated in Fig. 6. The parts are so proportioned that during this operation the lip 111 on the rack-lifter will not be brought into contact with the groove 112 on the rack 21.

The right-hand fixed bearing 59 of the ribbon-driving shaft 58 is formed at the bottom with a cut-away or groove 113, which receives the outer or, as viewed from the rear, right-hand end of a switching member or shifting plate 114. The plate 114 is formed with a slot 115, through which passes a headed-shoulder screw 116, the latter screwing into the bottom of the groove 113 and serving to support and guide the shifting plate. The inner end of the shifting plate is provided with an upwardly-extending arm 117, which is perforated to permit of the passage therethrough of the driving-shaft 58. The outer or, as viewed in Figs. 3, 5, and 6, right-hand face of the arm 117 normally contacts with the inner or left-hand edge of the arm 104 of the elbow or bell-crank lever 101. An angled piece or bracket 118 is adjustably secured by a headed screw 119 on the upper surface of the plate 114, and the upstanding arm 120 of the angled piece is positioned to enter the depression 68 in the sleeve 62. A wire spring 121 is secured by a screw 122 to the right-hand bearing 59 and enters a hole in the plate 114, said spring normally maintaining said plate 114 in contact with the arm 104 of the elbow-lever 101 and with the inner edge of the slot 15 against the shoulder-screw 116.

From the foregoing description it will be understood that while the carriage is under the control of the escapement devices and is being fed from right to left a letter-space distance at a time as the printing-keys are manipulated the connections between the ink-ribbon and the carriage spring-drum remain undisturbed. The result is that as the spring-drum is permitted to turn to draw the carriage leftward a letter-space distance the ink-ribbon is fed a corresponding distance because of its connection with said spring-drum through the train of mechanism comprising pinions 60 and 61, driving-shaft 58, pinions 57 and 56, shaft 54, pinion 53, gear-

wheel 52, upright shaft 50, and ribbon-spool 43. It will be noted that this connection between the ribbon-spools and the carriage-power is a direct one in the sense that the train of mechanism composing said connection does not include or contain any of the members of the escapement devices or other devices performing functions in the work of the machine not immediately relating to the ribbon mechanism. The ribbon-feeding mechanism described herein differs in this respect from that class of ribbon-feeding mechanisms which, although the ribbon-feeding power is derived from the carriage-power—i. e., the spring-drum 38 in this case—nevertheless has connections with such carriage-power which embrace or include elements of the escapement or other devices. The ribbon mechanism that I have described also differs from that class of ribbon mechanisms in which the power for feeding the ribbon is derived from the fingers of the operator as applied to the keys of the machine and not from the carriage-power. From certain aspects, however, my invention is not limited to ribbon-feeding mechanism having the characteristics above noted, but is applicable to any kind or style of ribbon-feeding mechanism.

When one of the release-keys 25 is depressed, the rock-shafts 23 are rotated in their bearings, swinging the arms 22 upward and lifting the carriage-rack 21 out of engagement with the escapement-pinion 27, thereby putting the carriage directly under the pull of the power residing in the spring-drum 38. As the carriage-rack 21 is lifted the lower side of the longitudinal groove 112 will contact with the lip 111 of the rack-lifter 107, which lip normally enters said groove 112 without touching the sides or bottom thereof, as best indicated in Fig. 3, so that as the carriage is moved back and forth from side to side of the machine no friction is generated by these parts. As the upward movement of the rack 21 is continued the rack-lifter 107 is caused to rise with it, swinging the arm 105 of the bell-crank lever 101 upward and causing the arm 104 of said lever to act upon the upright arm 117 of the switching member or plate 114 to slide said plate to the left as viewed in Fig. 5 against the pull of the wire spring 121. As the plate 114 is slid leftward the pinion 61 is also drawn leftward out of mesh with the pinion 60 by reason of the engagement of the arm 120 of the bracket 118 with the depression or groove 68 in the sleeve 62. The parts will now be in the position represented in Fig. 5, wherein it will be noticed that the notched flange 63 has been slid inward or to the left, so that it is close to the body portion of the clutch member 65, the notches of the flange remaining at all times engaged with the fingers 64 of the clutch. The result is that as

the carriage is released by pressure on one of the release-keys 25 the beveled pinion 61 on the driving-shaft 58 is disengaged from the beveled pinion 60, connected with the carriage-power, thereby breaking the connection between the carriage-power and the ribbon, so that the latter will not be fed, but will remain quiescent as the carriage is moved "by hand," as it is termed, from right to left across the top plate. When the pressure is withdrawn from the release-key 25, allowing the rack 21 to reengage with the pinion 27, the rack-lifter is permitted to move downward until the stop 109 contacts with the bracket 29, the bell-crank lever 101 returning to normal position therewith and the plate 114 being drawn by the spring 121 back to normal position, as indicated in Fig. 3. If on the return movement the teeth of pinions 60 and 61 should not mesh, the carriage-rack, rack-lifter, and bell-crank lever 101 will return to normal position, and the two pinions 60 and 61 will be pressed together by the spring 121, so that during the first letter-space movement thereafter imparted to the carriage the teeth of the two pinions will be forced to engage.

As hitherto described, when the tabulating-key 78 is depressed it brings the stop-lugs 94 into the path of the carriage-stop 95 and lifts the inner end of the lever 97 into contact with the pin 106, elevating the rack-lifter 107 and causing the convex shoes 110 to contact with the teeth of the rack 21 and to swing the latter upward out of engagement with the feed-pinion 27, thereby freeing the carriage from the control of the escapement devices to permit it to be drawn or "jumped" rapidly leftward under the influence of the carriage-power until the stop 95 contacts with the lug 94 of a stop member 93. The pin 106, it will be recalled, is fast to the free end of the arm 105 of the bell-crank lever 101, so that as said pin 106 is lifted by the lever 97 the arm 104 of the bell-crank will act on the upright arm 117 of the plate 114 to draw the latter leftward as viewed in Fig. 6 against the pull of the spring 121. As the switching member or plate 114 is slid leftward the arm 120 of the bracket 118 will act on the sleeve 62 to slide it and the beveled pinion 61 leftward along the driving-shaft 58 until said pinion 61 is disengaged from the beveled pinion 60. The parts will now be in the position indicated in Fig. 6. It will be observed that when the tabulating mechanism is operated to free the carriage from the control of the escapement devices and permit it to move rapidly to a predetermined point under the influence of the carriage-power the connection between said carriage-power and the ribbon will be broken, so that said ribbon will remain quiescent during this rapid movement or "jump" of the carriage. When the tabulating-key 78 is released, it,

together with the stop-bar 88 and the connections between them, will be restored to normal position by the springs 81 and 89, and the lever 97 will be restored to normal position, with the stop 97^a against the under side of the top plate, by the spring 100. The restoration of these parts permits the rack-lifter 107 and the lever 101 to return to normal position, while at the same time the plate 114 will be drawn back under the influence of the spring 121 and the pinion 61 will reengage with the pinion 60. The parts will then again be in the position represented in Fig. 3.

It will be observed that the carriage is disengaged or freed from the control of the escapement devices by duplex means, either the release-keys 25 and the train of mechanism controlled thereby or the tabulating-key 78 and the train of mechanism controlled by it being available for the purpose. It will also be noted that the lifting member or rack-lifter serves to lift the rack when the tabulating-key is operated, but that when a release-key is operated the rack lifts the rack-lifter, reversing the relations of the two parts. During the operation of the parts by the release-key the lever 97 and the tabulating mechanism by which said lever is operated remains quiescent. The ribbon remains quiescent throughout the time the carriage is disengaged from the escapement, so that when the carriage is reengaged with its escapement devices and a printing-key is actuated a type impression will be made on the ribbon immediately following the last preceding impression and as though there had been no disturbance of the relation between the carriage and its escapement mechanism in the interval between the two type impressions, whereas with a ribbon-feeding mechanism like that described, but with my present invention omitted, there would be an unused space on the ribbon between the two type impressions corresponding in length with the space which the carriage was jumped or fed while disconnected from its escapement mechanism. It will therefore be readily apparent that by the employment of my present invention this defect will be obviated, and the ribbon will be exhausted in an even and uniform manner, so that the character of the type impressions on the paper or work sheet will be uniform. It will further be observed that with a ribbon-feeding and ribbon-reversing mechanism of the character described, but with my present invention omitted, if the end of the ribbon were reached while the carriage was disconnected from its escapement devices and was being drawn rapidly across the machine by the carriage-power the worm 77 might be rotated so rapidly that the pin 76 would fail to coact therewith, or the cam-plate 70 might be turned so rapidly that it would

drop on top of the pin 72, so that the cam-surface 71 could not act upon said pin until another full turn of the ribbon-spool had been made, or in some other way the reversing mechanism might fail to act properly and the end of the ribbon might in consequence be torn from the exhausted ribbon-spool or the feed of the ribbon be stopped. By the employment of my present invention, however, it will be noted that the ribbon-reversing mechanism can operate only while the carriage is in engagement with its step-by-step-feeding mechanism and that too rapid revolution of the driving-shaft 58 is prevented, so that ample time for the proper working of the ribbon-reversing mechanism will always be given.

Various changes in the construction and arrangement of the parts may be effected within the scope of my invention.

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

1. In a type-writing machine, the combination of a carriage; means constantly tending to impel the carriage in one direction; carriage escapement devices; means for releasing the carriage from said escapement devices; ribbon-spools; connections independent of the escapement devices between the ribbon-spools and the carriage-impelling means; and means for automatically disconnecting the ribbon-spools from the carriage-impelling means when the carriage is released by said releasing means.

2. In a type-writing machine, the combination of a carriage; means constantly tending to impel the carriage in one direction; carriage escapement devices; means for releasing the carriage from said escapement devices; ribbon-feeding mechanism connected with said carriage-impelling means, said ribbon-feeding mechanism being independent of the escapement devices and of the carriage; and means automatically operative when the carriage is released from its escapement devices to render the ribbon-feeding mechanism inoperative and thereafter automatically to render the ribbon-feeding mechanism again operative.

3. In a type-writing machine, the combination of a carriage; means constantly tending to impel the carriage in one direction; carriage escapement devices; means for releasing the carriage from said escapement devices; ribbon-spools; connections independent of the escapement devices between the ribbon-spools and the carriage-impelling means; and means for disconnecting the ribbon-spools from the carriage-impelling means, said disconnecting means being automatically actuated.

4. In a type-writing machine, the combination of a carriage; means constantly tending to impel the carriage in one direction; carriage escapement devices; means for releas-

ing the carriage from said escapement devices; ribbon-spools; connections independent of the escapement devices between the ribbon-spools and the carriage-impelling means; and means for disconnecting the ribbon-spools from the carriage-impelling means, said disconnecting means being automatically actuated by the carriage-releasing means.

5. In a type-writing machine, the combination of a carriage; means constantly tending to impel the carriage in one direction; carriage escapement devices; duplex means for releasing the carriage from said escapement devices; ribbon-spools; connections independent of the escapement devices between the ribbon-spools and the carriage-impelling means; and means for disconnecting the ribbon-spools from the carriage-impelling means when the carriage is released by either of the duplex means.

6. In a type-writing machine, the combination of a carriage; means constantly tending to impel the carriage in one direction; carriage escapement devices; duplex means for releasing the carriage from said escapement devices; ribbon-spools; connections independent of the escapement devices and of the carriage between the ribbon-spools and the carriage-impelling means; and means for disconnecting the ribbon-spools from the carriage-impelling means when the carriage is released by either of the duplex means.

7. In a type-writing machine, the combination of a carriage; means constantly tending to impel the carriage in one direction; carriage escapement devices; means for releasing the carriage from said escapement devices; ribbon-feeding mechanism connected with said carriage-impelling means, said ribbon-feeding mechanism being independent of the escapement devices; automatic means for reversing the ribbon-feeding mechanism; and automatic means for preventing the operation of said ribbon-reversing mechanism.

8. In a type-writing machine, the combination of a carriage; means constantly tending to impel the carriage in one direction; carriage escapement devices; means for releasing the carriage from said escapement devices; ribbon-feeding mechanism connected with said carriage-impelling means, said ribbon-feeding mechanism being independent of the escapement devices; automatic means for reversing the ribbon-feeding mechanism; and duplex means automatically operated to prevent the operation of said ribbon-reversing mechanism.

9. In a type-writing machine, the combination of a carriage; means constantly tending to impel the carriage in one direction; carriage escapement devices; means for separating the carriage from said escapement devices; ribbon-feeding mechanism connected with said carriage-impelling means and inde-

pendent both of the escapement devices and of the carriage; automatic means for reversing the ribbon-feeding mechanism; and automatic means for preventing the operation of said ribbon-reversing mechanism.

10. In a type-writing machine, the combination of a carriage; means constantly tending to impel the carriage in one direction; carriage escapement devices; connections comprising a rack and pinion between the carriage and said escapement devices; a release-key on the carriage operative to disconnect said rack and pinion; ribbon-feeding mechanism connected with said carriage-impelling means and independent of said escapement devices; and means operative by said release-key to render the ribbon-feeding mechanism inoperative.

11. In a type-writing machine, the combination of a carriage; means constantly tending to impel the carriage in one direction; carriage escapement devices; connections between the carriage and said escapement devices; a release-key on the carriage operative to break the connection between the carriage and its escapement devices; ribbon-spools; connections between said ribbon-spools and said carriage-impelling means; and a switching member operative by said release-key to break the connections between said ribbon-spools and said carriage-impelling means.

12. In a type-writing machine, the combination of a carriage; means constantly tending to impel the carriage in one direction; carriage escapement devices; a release-key on the carriage adapted to separate the latter from its escapement devices; a ribbon-driving shaft connected with said carriage-impelling means; and a switching member operated by said release-key to break the connection between said driving-shaft and said carriage-impelling means.

13. In a type-writing machine, the combination of a carriage; means constantly tending to impel the carriage in one direction; carriage escapement devices; a release-key on the carriage adapted to separate the latter from its escapement devices; a ribbon-driving shaft; a pinion constantly connected with said shaft; a pinion connected with said carriage-impelling means and with said first-named pinion; and a switching member connected with said first-named pinion and operative by said release-key to separate said pinions.

14. In a type-writing machine, the combination of a carriage; carriage impelling or driving means; carriage escapement devices; a release-key on said carriage adapted to separate it from its escapement devices; a ribbon-driving shaft; a driving-pinion; clutch mechanism between said pinion and said shaft; a pinion connecting said carriage-impelling means with said driving-pinion; and a switching member constantly connected with said

driving-pinion and operated by said release-key to separate said pinions.

15. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; connections comprising a rack and pinion between said carriage and its escapement devices; a bell-crank; a lifting member connected to one of the arms of said bell-crank and having a sliding connection with said carriage-rack; ribbon mechanism connected with said carriage-impelling means; a switching member operated by said bell-crank to render the ribbon mechanism inoperative; and a release-key on the carriage adapted to separate said carriage-rack from its pinion and to actuate said lifting member.

16. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; a release-key operative to separate the carriage from its escapement devices; ribbon-spools; a ribbon-driving shaft; connections between said driving-shaft and said carriage-impelling means; means for shifting said driving-shaft longitudinally to connect it alternately with said ribbon-spools; and a switching member operated by said release-key to break the connection between said driving-shaft and said carriage-impelling means.

17. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; connections comprising a rack and pinion between said carriage and its escapement devices; a lifting member slidably connected with said carriage-rack; a switching member; a bell-crank connecting said switching member with said lifting member; ribbon-spools; a ribbon-driving shaft; a driving-pinion connected with said carriage-impelling means; clutch devices connecting said driving-pinion with said driving-shaft; automatic means for shifting said driving-shaft longitudinally to cause it to actuate alternately said ribbon-spools; and a release-key adapted to separate said carriage-rack from said pinion and also adapted to actuate said lifting member.

18. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; a tabulating-key operative to separate the carriage from its escapement devices and to permit it to move freely to a predetermined point; ribbon-feeding mechanism connected with said carriage-impelling means; and means operative by said tabulating-key to render the ribbon-feeding mechanism inoperative.

19. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; a tabulating-key operative to separate the carriage from its escapement devices and to permit said carriage to move freely to a predetermined point; ribbon-feeding mechanism con-

nected with said carriage-impelling means and independent of said escapement devices; and means operative by said tabulating-key to render the ribbon-feeding mechanism inoperative.

20. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; connections between the carriage and its escapement devices; a tabulating-key operative to break the connection between the carriage and its escapement devices to permit said carriage to move freely to a predetermined point; ribbon-spools; connections between said ribbon-spools and said carriage-impelling means; and a switching member operative by said tabulating-key to break the connection between said ribbon-spools and said carriage-impelling means.

21. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; a tabulating-key operative to separate the carriage from its escapement devices; a ribbon-driving shaft connected with said carriage-impelling means; and a switching member operative by said tabulating-key to break the connection between said driving-shaft and said carriage-impelling means.

22. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices, a tabulating-key adapted to separate the carriage from its escapement devices to permit said carriage to move freely to a predetermined point; a ribbon-driving shaft; a driving-pinion constantly connected with said shaft; a pinion operative by said carriage-impelling means and connected with said first-named pinion; and a switching member connected with said first-named pinion and operative by said tabulating-key to separate said pinions.

23. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; a tabulating-key adapted to separate the carriage from its escapement devices to permit said carriage to move freely to a predetermined point; a ribbon-driving shaft; a driving-pinion constantly connected with said shaft; a pinion operative by said carriage-impelling means and connected with said first-named pinion; a switching member connected with said first-named pinion; and operative by said tabulating-key to separate said pinions; and means adapted to cause positively a re-engagement between said pinions.

24. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; a tabulating-key operative to separate said carriage from its escapement devices to permit said carriage to move freely to a predetermined point; a ribbon-driving shaft; a driv-

ing-pinion; clutch mechanism between said pinion and said shaft; a pinion connecting said carriage-driving means with said driving-pinion; and a switching member constantly engaged with said driving-pinion and operative by said tabulating-key to separate said pinions.

25. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; connections comprising a rack and pinion between said carriage and its escapement devices; a rack-lifter; a bell-crank connected therewith; ribbon mechanism connected with said carriage-driving means; a switching member operative by said bell-crank to render said ribbon mechanism inoperative; and a tabulating-key which is operative upon said bell-crank.

26. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; a tabulating-key operative to separate the carriage from its escapement devices and to permit said carriage to move freely to a predetermined point; ribbon-spools; a ribbon-driving shaft; connections between said driving-shaft and said carriage-impelling means; means for shifting said driving-shaft longitudinally to connect it alternately with said ribbon-spools; and a switching member operative by said tabulating-key to break the connection between said driving-shaft and said carriage-impelling means.

27. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; connections comprising a rack and pinion between said carriage and its escapement devices; a rack-lifter; a switching member; a bell-crank connecting said switching member with said rack-lifter; ribbon-spools; a ribbon-driving shaft; a driving-pinion connected with said carriage-impelling means; clutch devices connecting said driving-pinion with said driving-shaft; automatic means for shifting said driving-shaft longitudinally to cause it to engage alternately with said ribbon-spools; a lever operative upon said bell-crank; and a tabulating-key adapted to operate said lever.

28. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; connections comprising a rack and pinion between said carriage and its escapement devices; a rack-lifter; a switching member; a bell-crank connecting said switching member with said rack-lifter; ribbon-spools; a ribbon-driving shaft; a driving-pinion connected with said carriage-impelling means; clutch devices connecting said driving-pinion with said driving-shaft; automatic means for shifting said driving-shaft longitudinally to cause it to engage alternately with said ribbon-spools;

a spring-pressed lever operative upon said bell-crank; a tabulator rack-bar; an actuating-link connected with said rack-bar and operative upon said spring-pressed lever; and a tabulating-key lever connected with said actuating-link.

29. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; connections including a rack and pinion between said carriage and its escapement devices; a rack-lifter; ribbon-feeding mechanism connected with said carriage-impelling means; connections between said ribbon-feeding mechanism and said rack-lifter; key-operated means adapted to operate said rack-lifter to break the connection between the ribbon mechanism and the carriage-impelling means; and separate key-operated means to actuate said rack-lifter to separate said carriage-rack from said pinion, said last-named means being also operative to break the connection between the ribbon-spool mechanism and the carriage-impelling means.

30. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; connections including a rack and pinion between said carriage and its escapement devices; ribbon-spools; connections between said ribbon-spools and said carriage-impelling means; key-operated means adapted to separate said carriage-rack from said pinion; and means actuated by said carriage-rack to break the connections between said ribbon-spools and said carriage-impelling means.

31. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; ribbon-spools; connections between said ribbon-spools and said carriage-impelling means; key-operated means adapted to break the connection between said ribbon-spools and said carriage-impelling means; and means actuated by said key-operated means to free the carriage from the escapement devices.

32. In a type-writing machine, the combination of a carriage; carriage-impelling means; carriage escapement devices; connections including a rack and pinion between said carriage and its escapement devices; ribbon-spools; connections between said ribbon-spools and said carriage-impelling means; key-operated means adapted to separate said carriage-rack from said pinion; means actuated by said carriage to break the connection between said ribbon-spools and said carriage-impelling means; key-operated means adapted to break the connection between said ribbon-spools and said carriage-impelling means; and means actuated by said key-operated means to lift said carriage-rack from the pinion to release the carriage.

33. In a type-writing machine, the combination of a carriage; carriage-impelling

means; carriage escapement devices; ribbon-
feeding mechanism connected with and op-
erated by said carriage-impelling means; a
release-key on the carriage adapted to sepa-
5 rate the latter from its escapement devices
and also adapted to render the ribbon-feed-
ing mechanism inoperative; and a tabulat-
ing-key in the keyboard adapted to separate
the carriage from its escapement devices in
10 order to permit said carriage to move freely

to a predetermined point, said tabulating-
key being also adapted to render said ribbon-
feeding mechanism inoperative.

Signed at Syracuse, in the county of Onon-
daga and State of New York, this 28th day 15
of June, A. D. 1905.

GEORGE A. SEIB.

Witnesses:

JOHN S. MITCHELL,
W. J. LOGAN.