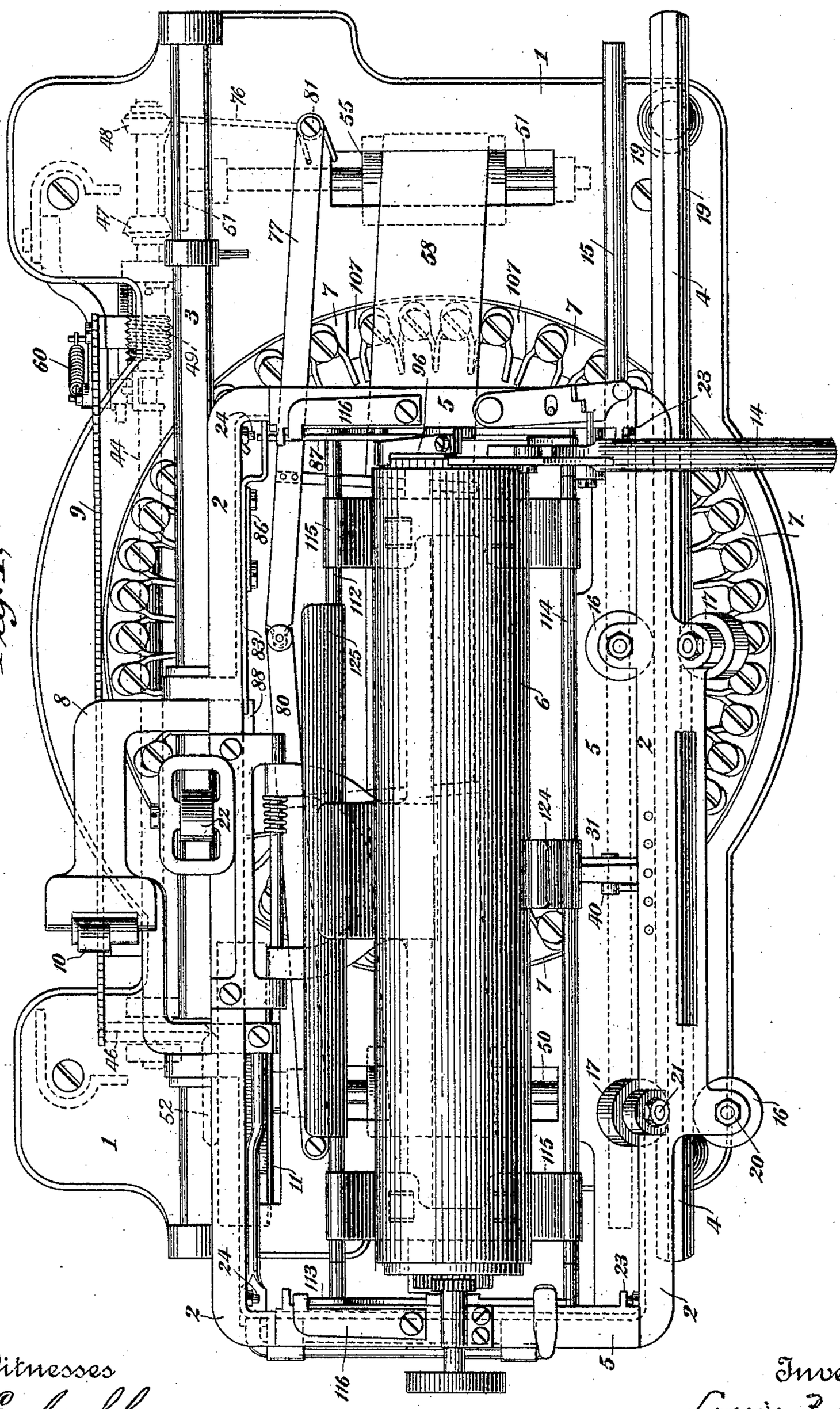
(No Model.) 5 Sheets—Sheet 1.

L. P. DISS.

TYPE WRITING MACHINE.

No. 526,894. Patented Oct. 2, 1894.

Fig. 1.



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(No Model.) 5 Sheets—Sheet 2.

L. P. DISS.

TYPE WRITING MACHINE.

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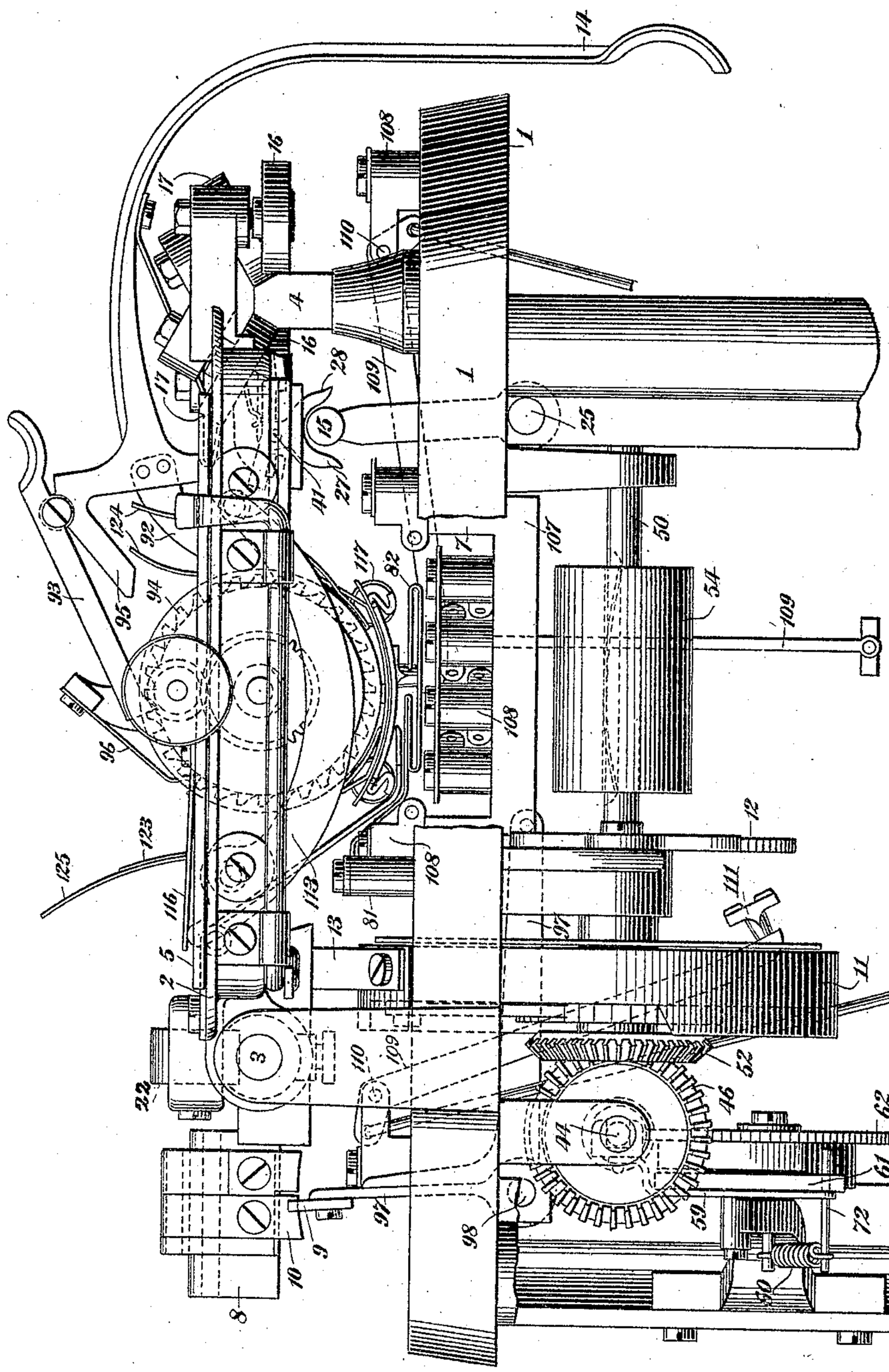

Fig. 2.

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L. P. DISS.

TYPE WRITING MACHINE.

No. 526,894. Patented Oct. 2, 1894.

Fig. 3,

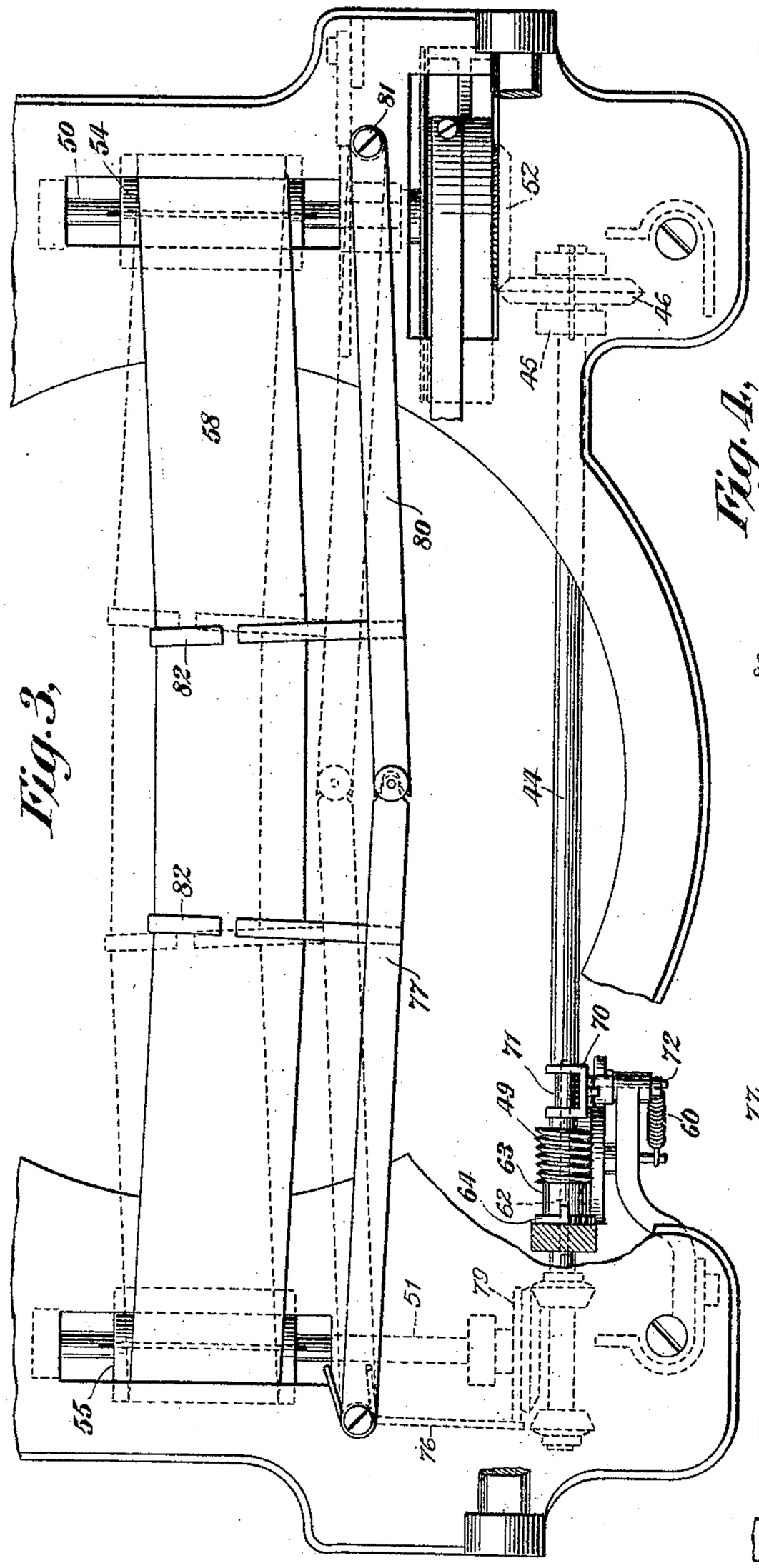


Fig. 4,

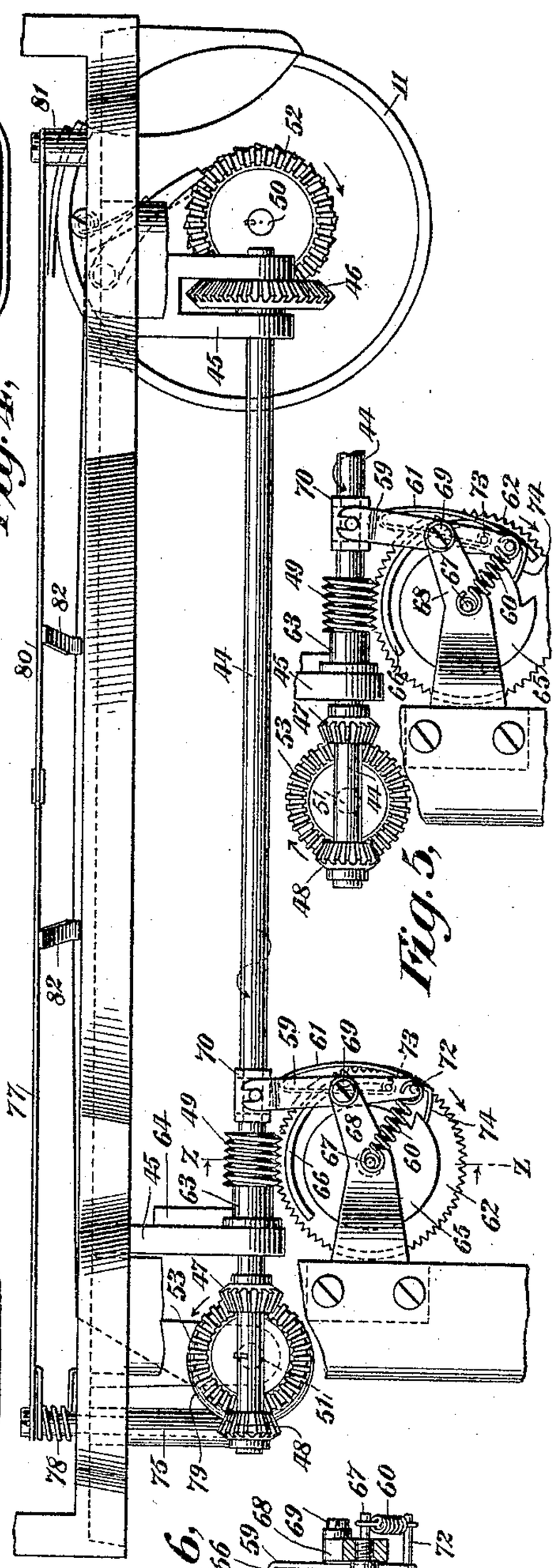
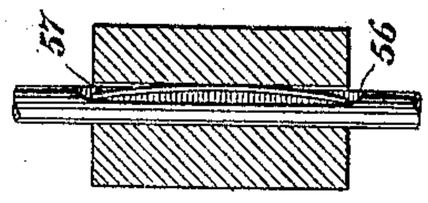


Fig. 5,

Fig. 7,



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L. P. DISS.

TYPE WRITING MACHINE.

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Fig. 9,

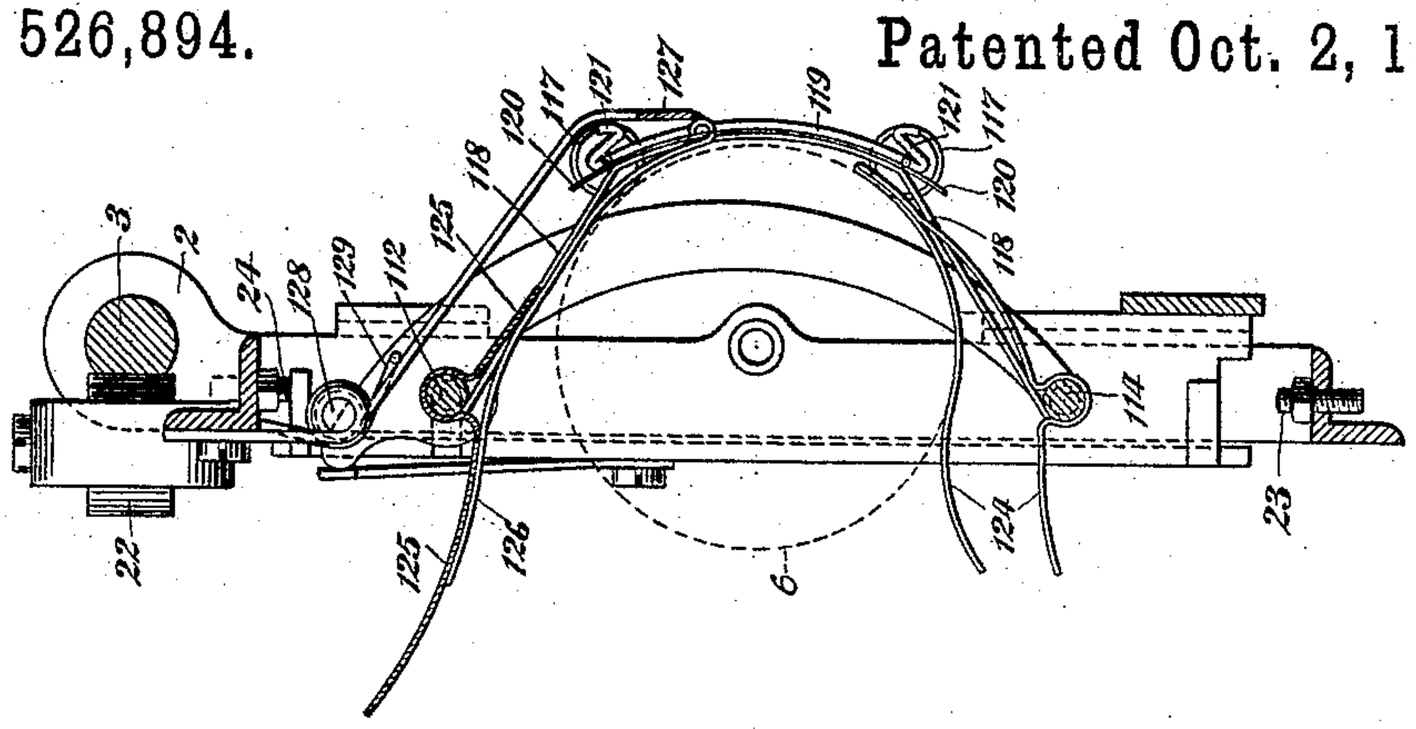
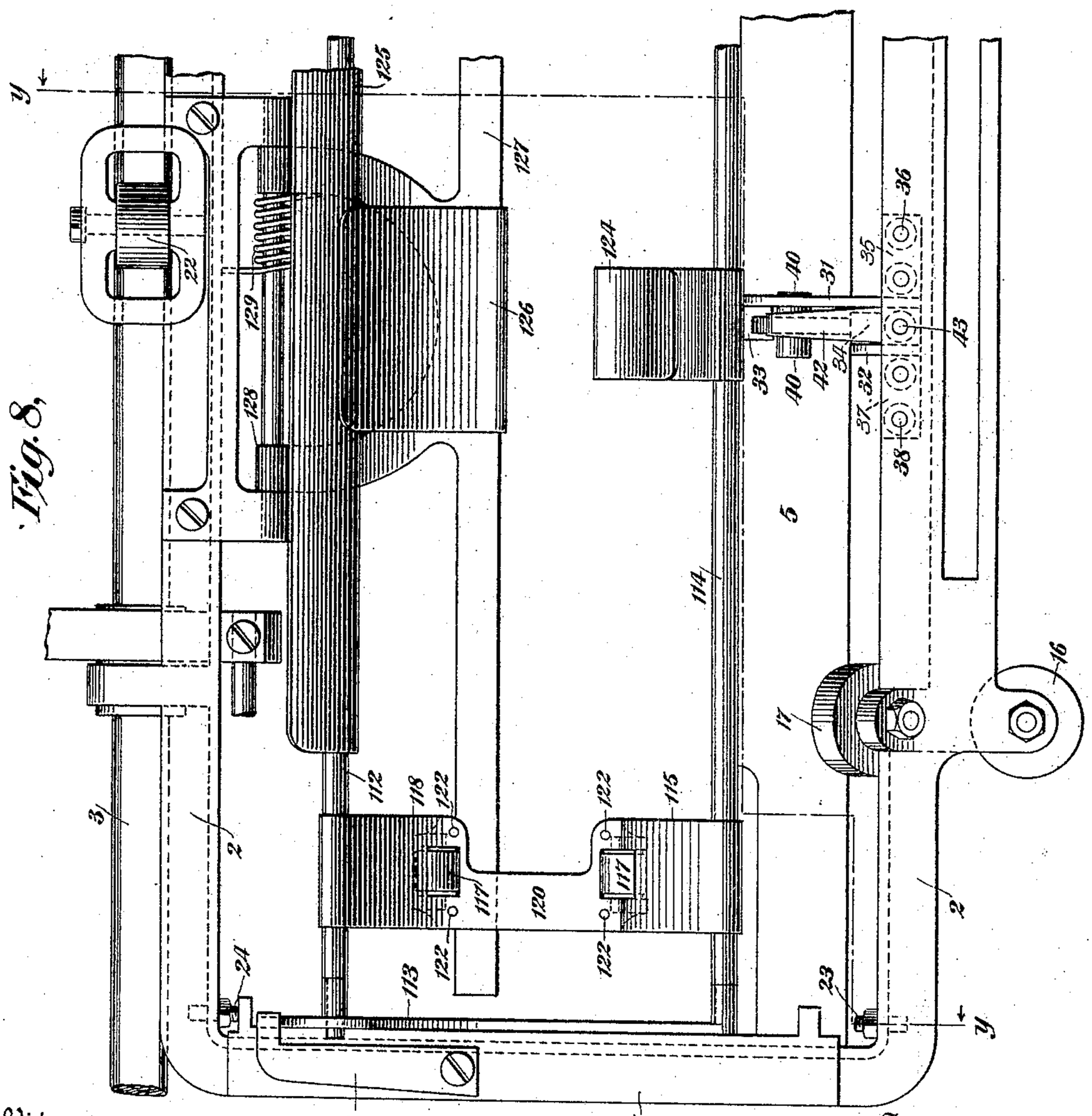


Fig. 8,



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(No Model.) 5 Sheets—Sheet 5.

L. P. DISS.

TYPE WRITING MACHINE.

No. 526,894. Patented Oct. 2, 1894.

Fig. 12,

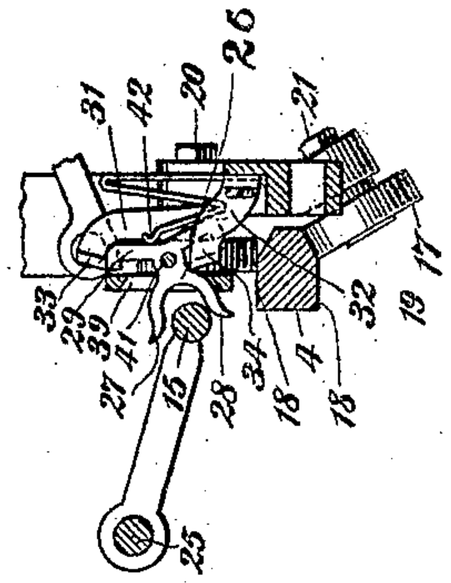


Fig. 15,

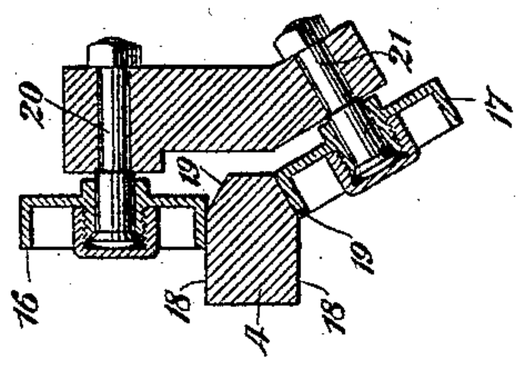


Fig. 14,

Fig. 13,

Fig. 11,

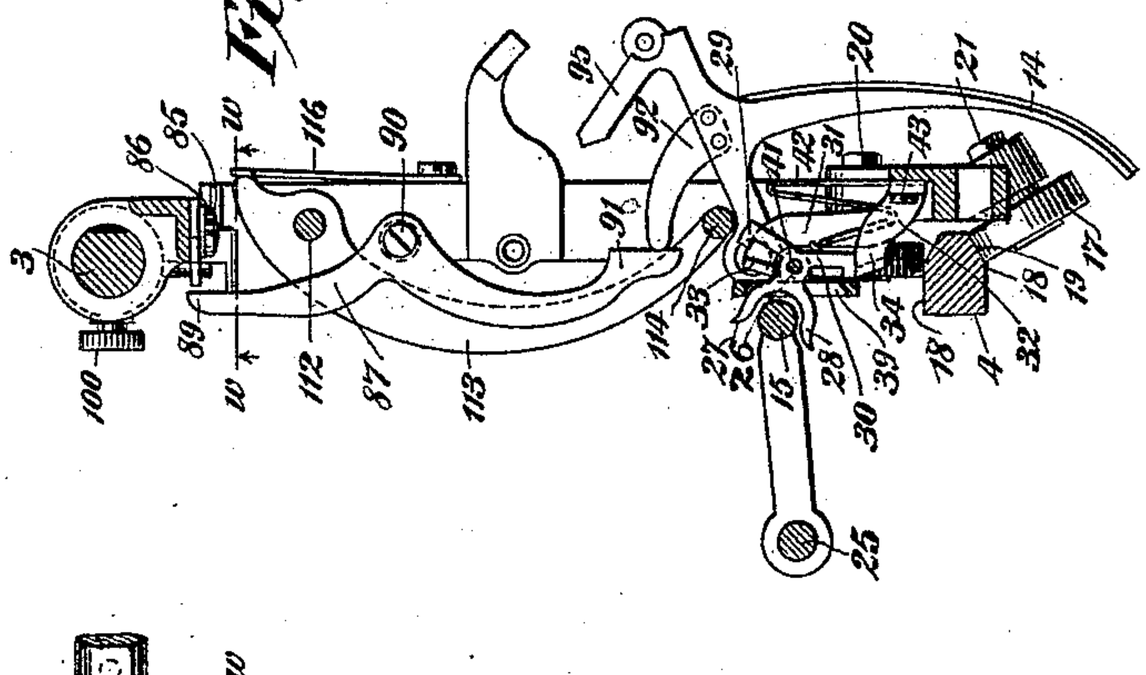
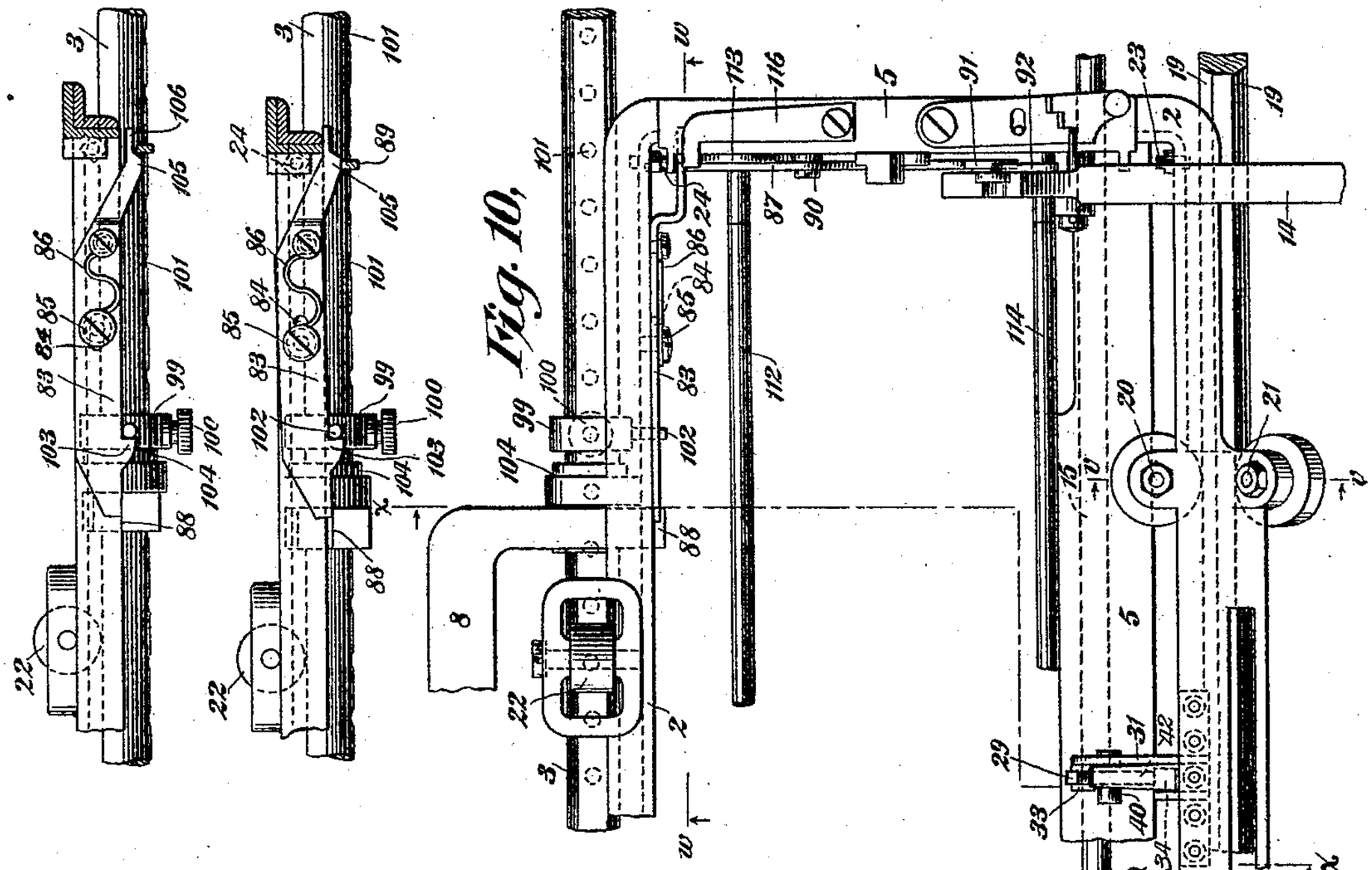


Fig. 10,



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UNITED STATES PATENT OFFICE.

LOUIS P. DISS, OF ILION, ASSIGNOR TO THE WYCKOFF, SEAMANS & BENEDICT, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 526,894, dated October 2, 1894.

Application filed September 26, 1892. Serial No. 446,870. (No model.)

To all whom it may concern:

Be it known that I, LOUIS P. DISS, a citizen of the United States, and a resident of Ilion, in the county of Herkimer and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

Some of my improvements relate to typewriters generally, while others relate more particularly to the "Remington" class of machines having two or more type on each type bar which necessitates a lateral shift of the platen cylinder to bring it into proper position to be struck by either of the type.

The main objects of my invention are to obviate the usual defective guiding of the paper carriage produced by the wearing of the usual anti-friction guiding rollers or their bearings; to provide a lateral shifting mechanism for the platen cylinder that is devoid of resistance to the movement of the carriage; to provide a ribbon moving mechanism whereby the ribbon may be automatically moved laterally and longitudinally and automatically reversed longitudinally until exhausted; to provide for locating the bottom of platen cylinder relatively to the type bar pivots in such a manner that the divergence of the type, when striking the paper on the platen cylinder is reduced to the minimum; to provide a device for disengaging and re-engaging the letter spacing dogs, whereby the disengaging and re-engaging will be simultaneous with the line spacing and carriage returning movements; to provide a paper feeding and guiding device wherein a greatly reduced diameter of anti-friction guiding rolls may be used, whereby their points of contact with the paper may be nearer to the line of print, and whereby the lateral space necessary for the paper guide may be reduced.

My invention consists in the various features of construction and combinations of devices hereinafter more fully described and particularly pointed out in the appended claims.

The accompanying drawings show so much of a type writing machine as is necessary to illustrate my several improvements.

Figure 1 is a top plan view of the machine with the paper carriage shown as moved nearly its full distance to the left, in order to afford a better view of some of the parts of the machine. Fig. 2 is an end elevation of the upper portion of the machine, the usually employed key-levers in this view, as well as in Fig. 1, being omitted in order that the parts may be shown on a large scale. Fig. 3 is a top plan view, partially broken away, with the paper-carriage removed, for the purpose of illustrating the means for moving the inking ribbon. Fig. 4 is a rear elevation of the same. Fig. 5 is a similar view, showing the ribbon moving devices in a different position. Fig. 6 is a vertical section taken at the line *z*, *z* of Fig. 4. Fig. 7 is a detail sectional view showing the mode of connecting one of the spools with its shaft. Fig. 8 is a partial plan view of the paper carriage, showing particularly the left hand half thereof. Fig. 9 is a vertical cross-section thereof, taken at the line *y*, *y* of Fig. 8. Fig. 10 is a partial plan of the paper-carriage, showing more particularly the right hand half thereof. Fig. 11 is a vertical cross-section taken at the line *x*, *x* of Fig. 10. Fig. 12 is a partial vertical section corresponding to a portion of Fig. 11, and showing the parts in their shifted positions. Fig. 13 is a vertical section taken at the line *w*, *w* of Figs. 10 and 11. Fig. 14 is a similar view with the moving parts in a different position, and Fig. 15 is a vertical section, taken at the line *v*, *v* of Fig. 10.

In the several views the same parts will be found designated by the same numeral of reference.

1 is the top plate of the machine; 2, the main paper carriage; 3, the rear carriage hinge rod; 4, the front carriage guide rail; 5, the auxiliary or platen carriage; 6, the platen or impression roller; 7, the type bar disk; 8, the dog frame or holder; 9, the spacing rack; 10, the spacing dogs; 11, the carriage spring driving drum; 12, the carriage tension ratchet; 13, the strap connecting the carriage to the driving drum; 14, the carriage line spacing and releasing lever, and 15 the carriage shift rod.

For the purpose of obviating the usual defective guiding of the carriage, caused by the wearing of the usually employed grooved guiding rolls or their bearings, I provide at

the front side of the carriage 2, two pairs of cylindrical guide rolls 16, 16, and 17, 17, the rolls 16, 16 bearing against the opposite vertical sides 18 of the carriage guide rail 4, and the rolls 17, 17 bearing against the opposite inclined sides 19 of said rail.

The rolls 16, 16 are mounted to turn on vertical pivots 20, and the faces of said rolls, as well as their pivots 20, are arranged parallel with the faces 18 of the guide-rail, against which said rolls work. The rolls 17, 17 are mounted upon obliquely-arranged pivots 21, and the faces of the rolls 17, 17, and the planes of their pivots are all parallel with the inclined sides 19 of the guide-rail, with which said rolls co-operate.

The weight of the carriage at its front side wedges or forces the guide rolls 17, 17 down the inclined sides of the guide rail, and these rolls moving down said inclined sides operate to force or draw the vertical rolls 16, 16 firmly against the vertical sides of the track, thus preventing any undue vibration or skewing action of the carriage, which, as is well-known, seriously affects the alignment of printing in type writing machines, especially when operated at high speed.

By having the guide rolls 16, 16 bear against the vertical sides of the guide rail a greater resistance to the side motion of the carriage is obtained than would be if the rolls were set to bear against the inclined sides, as in the latter arrangement the carriage could raise slightly every time a letter space is made on account of the inclined sides offering little or no resistance to the upward movement of the rolls under the skewing action of the carriage. In the construction shown the vertical sides of the track and the vertical faces of the horizontally-arranged rolls 16 effectually prevent any lifting action or skewing of the carriage.

As wear on the rolls, bearings, pivots and track takes place, the horizontal rolls are automatically drawn firmly against the track by the oblique rolls working on the inclined sides of the track, the oblique rolls as wear occurs bearing farther down on the inclined sides, the carriage front portion descending accordingly. It will thus be seen that by this arrangement of the carriage guide rolls the firm holding and accurate guiding of the carriage is not dependent on the exact fitting of the guide rolls and their bearings, and hence wear of the guide rolls and their bearings will not affect the guiding of the carriage. While I prefer to arrange one of the rolls 16 and one of the rolls 17 directly opposite each other on opposite sides of the track and near each end of the carriage, because a better bearing or support and guide for the carriage is thus obtained, this arrangement is not, however, essential; nor is it absolutely necessary to employ four rolls, as three may be used, two vertical faced rolls 16 on one side of the guide rail, and one obliquely-arranged roll on the opposite side of the guide rail, set about intermediately of the other two rolls, the two rolls 16, 16 working against the vertical side of the track, and the one oblique roll 17 working against the inclined side of the track.

The rear side of the carriage 2 is hinged upon the hinge-and-guide-rod 3 and may be provided with an anti-friction roller 22 to run on top of said rod. The carriage hinge joint is sufficiently loose to permit the front rolls to adjust themselves to the guide rail 4. The back roll merely supports the carriage, while the front rolls serve to steady and guide the same.

The auxiliary carriage or platen carrier 5 is mounted upon the main carriage 2 in about the usual way, for the purpose of obtaining the necessary back-and-forth movement of the platen, the type-bars having two types.

Near each end of the front and rear bars of the main carriage 2, are placed two adjustable screw-stops 23, 23 and 24, 24. The platen carrier in its normal forward position is held against the stops 23, and in its shifted backward position against the stops 24. The platen carrier is shifted back and forth transversely of the main carriage by the usual shift rod 15, which as heretofore, is mounted upon rocker-arms attached to a rock-shaft 25 connected with a finger-key-lever at the keyboard. (Not shown.) The said shift rod, as usual, is actuated in one direction (rearwardly) by a depression of its lever-key, and is returned by a spring. (Not shown.)

For the purpose of shifting and firmly holding the platen carrier in either position, I provide the following means: On the front rail of the platen-carrier 5 is pivoted a latch 26 having four arms 27, 28, 29 and 30, the arms 27 and 28 being alternately acted upon by the shift rod 15, whereby the latch is actuated.

Upon the carriage 2 is fastened adjustable stops 31 and 32, the former having an inclined ledge 33, and the latter an oppositely-inclined ledge 34, against which ledges the locking arms 29 and 30 of the latch work in the operation of shifting the auxiliary carriage, the locking arms 30 bearing against the ledge 34, during the shifting of the platen carrier rearwardly, and the locking arm 29 bearing against the ledge 33 during the return or forward shift of the platen carrier. The stop member 31 is preferably formed with a base-plate 35 arranged to project in a direction opposite to that of the inclined ledge 33, and is secured to the front, central portion of the main carriage by two screws 36 passing upwardly from the under side of the carriage. The stop member 32 is also preferably provided with a base plate 37 which projects in a direction opposite to that of the ledge 34 and is secured to the main carriage by screws 36, in the manner of the plate 35. The front bar of the platen carrier 5 is slotted or cut away at 39 for the passage therethrough of the latch 26 and on either side of said latch

is formed with a projecting boss 40 to receive the pivot 41 of said latch.

Normally, or during the operation of the lower case types the platen carrier is held against the stop screws 23, 23 by reason of the engagement of the free end of the arms 29 with the inner edge of the ledge 33.

When the shift rod is moved rearwardly against the arm 27 the locking arm 29 will be swung upwardly, thus releasing the platen carrier, and the locking arm 30 downwardly against the ledge 34, whereby the swinging movement of the latch is arrested, thus causing the arm 30 to slide on the ledge 34 until the end of the arm 30 has passed the inner end of the ledge 34, when the swinging movement of the latch will be resumed and the end of the locking arm 30 will be swung in front of and against the inner end of the ledge 34, thus firmly holding the platen carrier against the stop screws 24, 24.

Upon releasing the shift key or causing the shift rod to be moved forwardly, the arm 28 is contacted with by said rod and the latch vibrated so that the arm 30 is raised from engagement with the edge of the ledge 34, and the arm 29 lowered to ride upon the ledge 33 and to finally drop in front of the inner edge thereof at about the end of the forward movement of the latch 26 in the slot 39, in which position the said arm 29 will operate to firmly hold or lock the platen carrier against any accidental rearward movement.

At Fig. 12 the platen carrier is shown as locked in its forward normal position, and at Fig. 11 as locked in its rearward, shifted position. The ends of the locking arms 29 and 30 are slightly cam-shaped for the purpose of wedging and more firmly holding the platen-carrier in either position.

In order to avoid any friction or resistance to the movements of the main carriage, during the writing, by the latch upon the shift rod, a spring 42 is provided to break the contact of the latch with the shift rod after the movement of the shift rod is completed. The spring 42 is attached to the front rail of the main carriage by a screw 43 and is bent so that its free end may be rested upon either of the arms 29 or 30 of the latch, according to the position of said latch or the shift rod.

At Fig. 12 is shown the free end of the spring as pressing against the locking arm 29, and by the action of said spring on said arm, the arm 28 of the latch is thrown slightly away from the surface of the shift rod immediately after the latter has returned to its normal position, or come to rest.

At Fig. 11, it will be seen that after the shift-rod has ceased its rearward movement the spring has operated upon the arm 30 of the latch to slightly rock the same and cause the arm 27 of the latch to move away from the surface of the shift rod. Thus, the platen carrier shifting devices are prevented from offering any resistance to the movement of the main carriage, since the fork of the latch at no time touches the shift rail when the carriage is feeding

44 designates a ribbon shaft, which is hung in suitable bearings 45 at the rear of the machine, and which is revolved always in one direction by means of the carriage spring driving drum 11. On the shaft 44 is fastened bevel gears 46, 47 and 48 and a worm gear 49.

50 and 51 designate ribbon spool shafts, to which are secured, respectively, bevel gears 52 and 53. The spring driving drum 11 is preferably mounted in the usual way and axially of the shaft 50, and the gear 52 thereupon engages constantly with the gear 46 of the shaft 44. The gear 53 is alternately engaged by the gears 47 and 48, whereby the shaft 51 is first revolved in one direction and then in the other.

To the shafts 50 and 51 are loosely fitted the ribbon spools 54 and 55, respectively. Each of said ribbon spool shafts is formed with a depression 56, in which is seated a curved-bar-spring 57 which presses against the bore of the spool and causes the spool to revolve with the shaft. The spring 57 in the shaft 50 has only sufficient strength or power to carry its spool 54, which merely winds up the slack ribbon caused by the unwinding of the ribbon by and from the opposite, controlling spool 55. The spring in the shaft 51 has strength enough to overcome the spring in the shaft 50 and wind the ribbon from the spool 54 on to the spool 55. The shaft 50 is caused to revolve enough faster than the shaft 51 to enable the spool 54, when empty, to wind up the slack ribbon as fast as it is unwound by and from the spool 55, when it is full. The purpose of this arrangement of the spools is to insure a predetermined length of ribbon being carried from one spool to another by a predetermined number of revolutions by the ribbon spool shaft 51, thus making the spool 55 the controlling spool.

It will be seen that the tight or loose winding of the ribbon on the spool 54 does not affect the amount of ribbon that will be wound upon it, as the amount of ribbon wound upon the spool 54 will depend on the amount let off by the spool 55, which latter will take on and let off the same amount of ribbon by the same number of revolutions of the spool in opposite directions.

It will be understood that the carrying of the spool 55 with the shaft 51, by means of the friction spring is not essential to the proper performance of the functions described, as the parts would operate just as well if the spool 55 were secured to the shaft 51 or otherwise permanently secured thereto. The main purpose of having the spool 55 revolve with the shaft by means of the friction spring is, that the spool may be revolved by hand without revolving its shaft, thereby facilitating the endwise adjustment of the ribbon, as when several colors of ribbon are fastened together, to bring either of them into use.

I prefer to make both ribbon spools of the same diameter to insure the slack ribbon being taken up by the spool 54, and to provide for revolving it faster than the spool 55, though this is not essential to the proper working of my plan, inasmuch as the spool 54 may be made enough larger in diameter than the spool 55 to produce the same effect.

For the purpose of instantly reversing the movement of the ribbon 58, I provide for alternately engaging the bevel gears 47, 48, with the bevel gear 53 on the spool shaft 51, by a longitudinal movement of the shaft 44, which is connected to a lever 59 that is actuated alternately in opposite directions by springs 60 and 61 at each half revolution of a worm wheel 62, at which times the ribbons will have been transferred from one spool on to the other. The worm wheel 62 is engaged by the worm 49, which is cut on a sleeve 63, whose bore is slotted to receive a feather 64 arranged longitudinally of the shaft 44, whereby the worm wheel is caused to turn always with said shaft, and whereby said shaft may be slid longitudinally independently of the worm. The worm-wheel is provided on one side with a cam 65 and with a concentric ledge 66, and is pivoted at 67 in an arm or bracket 68 fastened to the frame work of the machine. The lever 59 is pivoted at 69 to said arm or bracket and is pivotally connected at its upper end to a yoke 70, which engages an annular groove 71 in the shaft 44, thus connecting the lever 59 to the shaft 44 in such a manner that the vibrations of said lever will effect longitudinal movements of said shaft.

At the lower end of the lever 59 is fitted a pin 72 which projects on both sides of said lever, the inward projection serving to engage the concentric ledge 66 and arrest the lever 59, and also hold the spring 61 under strain. The outward projection of the pin 72 serves to connect the coiled spring 60 with the lever 59, and the bent bar spring 61 fastened at one end at 73 to the lever 59, is so arranged that its other, free end is held by its own elasticity against the pin 72 and with sufficient force to overcome the power of the spring 60, and in such a manner that when the active end 74 of the spring is forced outwardly toward the right by the cam 65, said spring 61 will carry with it the lever 59, after the ledge 66 has passed by the pin 72. The spring 60 is a pulling spring, and has one end fastened to the pin 72, and its other end fastened to the pivot 67, thus constantly pulling on the lever 59 and holding the end 74 of the spring 61 against the cam 65.

The spring 61 being held against the pin 72 of the lever 59 by its own force, which is greater than the force of the coiled spring 60, the effect of the spring 60 pulling on the lever 59 is merely to hold the end 74 of the spring 61 against the cam 65 until the junctions of the high and low portions of the cam pass the end 74 of the spring when the lever 59, with the spring 61, will be swung toward the center of the cam by the coiled spring 60 until arrested by the end 74 of the spring 61 being brought against the low point of the cam 65. During this vibration of the lever the shaft 44 is moved longitudinally toward the right (considered from the back of the machine) the gear 47 thrown out of mesh and the gear 48 into mesh with the gear 53, thus automatically shifting the devices to effect a reversal of the longitudinal movement of the ribbon.

As the worm wheel 62 revolves, the inward projecting portion of the pin 72 will now lie between the cam and the concentric ledge and will bear against the latter, thus holding the lever 59 while the cam is gradually forcing the spring 61 away from the pin 72. When the cam has completed a half revolution the rear end of the concentric ledge will have passed the pin 72, and thus release the lever, which will then be swung outward by the spring 61 until arrested by the pin 72 coming against the spring 61. During this movement of the lever 59 the shaft 44 is moved toward the left and the devices are again shifted for effecting a movement of the ribbon in the opposite direction. Thus, the ribbon is automatically reversed longitudinally at each half revolution of the worm wheel, which as will be seen, is geared to revolve slowly and preferably so that the reversal will take place at about the time either spool is full.

For the purpose of effecting a lateral transverse movement of the ribbon the top plate 1 is provided with suitable upward and downward projections to serve as bearings for a vertical shaft 75, the lower end of which is provided with a horizontally arranged arm 76, and to the upper end of which is securely fastened a horizontally arranged ribbon carrier 77. Under the said carrier and surrounding the upper projection of the top plate is secured a coiled spring 78, one end of which is connected to the top plate, and the other end of which is connected to the carrier 77, whereby the arm 76 is constantly held against a cam 79, which is fastened to and revolves with the ribbon spool shaft 51. Thus, the rotations of said shaft will effect oscillations of the carrier 77. A second ribbon carrier 80 is pivoted upon a stud 81 on the top plate and has a gear-tooth connection with the carrier 77, about centrally of the machine. To said carriers 77 and 80 are fastened loops or ribbon guides 82. Thus, it will be seen that the revolutions of the shaft 51 in either direction will effect back-and-forth lateral movements of the ribbon, whereby its entire surface widthwise may be utilized.

For the purpose of disengaging the letter spacing dogs and effecting a line space simultaneously, and at the same time returning the carriage for the beginning of a new line and re-engaging the letter spacing dogs, I provide a lever 83 having an oblong hole 84, through which a screw or pivot pin 85 is passed to movably secure the lever to the carriage 2, the lever having both a rocking movement

and a movement in the direction of its length. To said lever is fastened one end of a spring 86, the other end of which is fastened to the screw or pivot 85 in the carriage 2, the tension of the spring operating normally to hold the left hand end of the slot or oblong hole 84 of the lever against the screw 85.

The dog frame or holder 8 is pivoted to the carriage 2 at points through which the hinged rod 3 passes and is connected to the line space lever 14 by the lever 83 and an intermediate lever 87 arranged at right angles thereto, one end of the lever 83 bearing on the forward extension or lip 88 of the dog frame, and the other end bearing on the end 89 of the lever 87, which is pivoted to the platen-carrier by a screw 90, and has its forward end 91 arranged in the path of an arm 92 of the line space lever, which is provided with a driving pawl 93 to engage a ratchet wheel 94 connected to the platen, and which is also provided with an arm 95 to prevent any overthrow of the platen.

96 is a spring detent or hold fast dog for the platen ratchet-wheel.

By an outward pull on the depending end of the line space lever, whereby the platen is partially rotated, the arm 92 will be swung down against the end 91 of the lever 87, vibrate said lever and through the vibration of the lever 83, to which it is connected, cause the inner forward end of the dog frame to be depressed and its opposite end carrying the dogs to be raised, so as to free the dogs from engagement with the feed rack, which, as heretofore, is mounted upon a vibratory frame 97 pivoted at 98 and connected, as usual, below the key-levers with the universal-bar. (Not shown.)

If at the time the line space lever is pulled outwardly it is pushed or pulled laterally toward the right, the carriage may be returned to a starting point of a new line. During the return of the carriage and immediately before it is arrested by its marginal stop 99, the dog frame is released to enable the dogs to re-engage the feed rack. This is effected in the following manner: Upon the hinge rod 3 is arranged the marginal stop 99, which is in the form of a collar, and which may be adjusted upon said rod to various points and secured by a screw or spring-bolt 100, whose point may take into any of a series of notches or depressions 101 in said rod 3. The said collar 99 is provided with a forwardly-projecting pin 102 which extends in the path of a lug 103 on the lever 83 and serves to arrest said lever before the projection 104 on the carriage strikes against said collar, and hence before the return movement of the carriage is completed. When said lug 103 strikes said pin 102 and arrests said lever, the continued movement of the carriage causes the screw 85 to move through the slot 84, and compress the spring 86, until the projection 104 strikes the collar 99, at which time the end 89 of the lever 87 is carried past its bearing 105 on the lever 83, and brought under the elevated lip 106 at the extreme right of said lever. When this occurs, the resistance offered to the weighted or heavier end of the dog frame being removed, said frame at its rear end will move downwardly to re-engage the dogs and simultaneously vibrate the lever 83 from the position shown at Fig. 13 to that shown at Fig. 14. When the writing is resumed the carriage moves toward the left, but the lever 83 does not partake of the motion until the screw 85 has traveled to the left hand end of the slot in the lever.

From the foregoing, it will be observed that the re-engagement of the letter spacing dogs with the rack is effected by and simultaneously with the carriage return movement and before the pull on the line space lever has been discontinued.

A type bar pivoted at right angles to the path of travel or longitudinal axis of the platen affects the alignment most when a number of sheets are placed upon the platen, as in manifolding, the greater the number of sheets the farther away from the axial line of the platen is the impression produced. Hence, the extreme front and the extreme rear type bars in manifolding print one below and the other above the true line of impression, and this departure from true alignment decreases from said type bars, on either side, gradually until the type bars whose pivots are arranged in line or substantially in line with the axis of the platen at the right and left hand side of the machine are reached.

A type bar pivoted to vibrate in the plane of the longitudinal axis of the platen, or line of impression cannot print out of alignment, no matter how many sheets of paper may be added to the platen, the only effect upon such type bar being in respect to its spacing. Hence, the distance which the pivot of said type bar is arranged below the lower side of the platen is immaterial so long as the type is capable of striking at the center of the system of type bars.

From the above it will be seen that the several (usually four) type bars on the right and left hand sides of the circle, over which the platen must travel, are the ones which affect the alignment least, while from these bars on either side to the front and rear of the circle the alignment is more and more affected until the points mentioned are reached.

Heretofore it has been customary to arrange all of the pivots of the type bars about an inch or so below the plane of the under side of the platen, and generally all of said pivots have been arranged in the same horizontal plane. When the pivots are thus arranged below the under side of the platen the paths of the diametrically-opposite type bars intersect each other some distance below the platen, and after diverging finally meet again at the printing point or at the sur-

face of the platen. The arcs of vibration or paths of the type diverge in proportion to the distance which their pivots are arranged below the plane of the under side of the platen. Therefore, with such a construction or arrangement, the greater the amount of paper placed upon the platen the worse the alignment of the printing.

As it is impossible to secure absolute alignment in this class of machines, in manifolding, I have discovered that vastly better results may be obtained than heretofore by pivoting the type bars which by their divergence affect the alignment most in a plane where they will diverge the least; viz: in the plane of the under side of the platen, and by lowering the pivots of those type bars which would come within the path of travel of the platen or the paper thereon. In other words, I depress or lower the plane of the pivots of several of the type bars at each side of the machine over which the platen travels, and lower the plane of the under side of the platen to the horizontal plane of the remaining type bar pivots. By this construction and arrangement it will be observed that each of two oppositely-arranged type bars of the raised series work in arcs of circles tangential to each other and to the vertical axis of the platen and do not cross each other at any point but meet at the platen.

The types of type bars so pivoted or arranged work in paths in the vicinity of the platen, which diverge considerably less than types which work in paths that cross each other and then meet, as heretofore, and for this reason the enlargement of the platen by the addition of sheets for manifolding, thus lowering the printing point, does not affect the alignment in the same proportion or to the same extent as under the former construction, and by the means described the divergence of the types and the departure from true alignment are reduced to the minimum.

By referring to Figs. 1 and 2, it will be observed that the type bar disk 7 is sunken or depressed, as at 107, on the right and left hand sides in line with the path of travel of the platen, and at such points I preferably arrange four of the hangers 108 of the type bars 109. From said portions 107 the remainder of the type disk is raised, and the remaining type bar hangers 108 secured thereon are arranged so that the pivots 110 of the type bars lie in the same or substantially same horizontal plane as the under side of the platen. The type 111 bear an upper and lower case letter or two characters as usual in this description of machine; but in a non-shifting platen machine of course only one type on a bar would be used. In lieu of raising the type bar disk on either side of the portions 107 the same effect may be obtained by employing hangers of greater height.

I shall now describe the devices employed for feeding and guiding the paper: 112 is a shaft supported in bearings in the platen carrier 5. At or near each end of said shaft is pivoted an arm 113 which extends forwardly and receives one end of a parallel shaft 114. To the shafts 112 and 114 are movably affixed the paper guide roll supports 115, and to the platen carrier are fastened springs 116, the free ends of which press against the arms 113 at their rear ends and force the shaft 114 and the paper guide supports 115 upwardly, and the paper guide rolls 117, mounted therein, firmly against the platen cylinder or the paper thereon. By pressing down on the shaft 114 the paper guide rolls will be moved away from the platen, and their supports 115 may be moved along on the shafts 112 and 114 or adjusted, and thus various widths of paper may be held and guided near their edges. Each support 115 preferably carries two guide rolls 117, one on each side of the vertical central line of the platen, and each support 115 is composed of a band 118, which is formed with a hook at each end, to surround the shafts 112 and 114, and is bent downwardly to extend under the platen, at which locality it is curved; a journal box or frame 119, and a journal cap or cover 120.

The band 118 is made of thin metal so that the paper guide rolls may adjust themselves to the platen. The journal box or frame 119 is made of sheet metal the thickness of the diameter of the paper guide roll journals, and has notches of a size to accommodate the journals in a manner such that each of the notches forms one end and two sides of a journal box, the third side being formed by folding the ends of the metal underneath, as shown at 121. The journal-cap or cover 120 is made of thin and elastic metal so that it can be easily sprung to allow the paper guide roll journals to be passed into or removed from their sockets. The three portions of the support are all formed with coinciding holes, through which rivets 122 are passed to secure said parts firmly together, and all of said parts are of course formed or provided with cut-aways or openings for the projection therethrough of the guide rolls. The guide rolls may be provided with a rubber sheath or covering, as indicated.

To prevent sagging at the middle of wide paper and to more perfectly feed and guide the paper, I provide guides 123 and 124, about centrally of the platen carrier, the former being arranged at the rear side of the platen, and the latter at the front side thereof. The guide 123 is made of two pieces of sheet metal fastened together, one piece, 125, of which is thick enough to serve for the paper shelf or table and is bent to fit the shaft 112 on which it is pivoted. The other piece 126 extends down and under the platen in proximity to the impression point, and then is turned downward against a scale-bar 127, by which it is held against the platen.

The guide 124 is bent to fit the shaft 114,

on which it is pivoted. The portion extending upward from its shaft serves for its manipulation, which is by pressing it toward the platen. The portion extending downward is bent under the platen in proximity to the impression point, and is then doubled and formed to embrace enough of the platen cylinder to hold itself in position thereon. It will be seen that by pressing the upper portion toward the platen the lower portion will swing outwardly and allow the edge of the paper to pass between it and the platen, and that by then releasing the upper end of the guide, the lower portion will spring inward and hold the paper against the platen.

The scale bar 127 is hinged to the main carriage 2 at 128 and is held against the paper guide roll supports 115 by a spring 129, with its graduated edge close to the path of the type, whereby the line of print will be in line with the edge of the scale. The usual scale differs from this in that it is fastened to and shifted with the platen carrier, which makes it necessary to locate the edge of the scale away from the line of print a distance equal to the lateral movement of the platen carrier. The purpose of hinging the scale as shown is to allow it to be swung away from the platen with the lower portion of the guide 123, whereby the end of the paper after having passed from between the platen and the guide may be returned.

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

1. In a type writing machine, the combination with a guide-rail, of a paper-carriage frame having a series of guide-rolls arranged to bear on the opposite sides of said rail, the said series of guide-rolls comprising obliquely-arranged guide-rolls operating to draw or force the guide-rolls on the opposite side of the said rail against said rail as wear takes place; the axes of all of said rolls being parallel to their faces, and the said obliquely-arranged rolls being forced against the guide-rail and their pivots by the weight of the paper-carriage frame independently of the position of the platen, whereby the paper-carriage is firmly guided and the wear of the bearings automatically compensated for.

2. In a type writing machine, the combination with a guide-rail, of a carriage-frame having both horizontally and obliquely arranged guide-rolls, the axes of all of which are parallel with their faces.

3. In a type writing machine, the combination with a vertically-arranged guide-rail having inclined sides at its top, of a paper-carriage frame having a series of guiding rolls arranged to bear on opposite sides of said guiding rail, the faces of said guiding rolls being all parallel to their axes and so mounted or arranged as that the weight of the carriage frame will cause the rolls to bear against the inclined sides of the guide-rail and against their pivots independently of the position of the platen and cause the series of rolls to clasp or hug the guide-rail on its opposite sides.

4. In a type writing machine, the combination with a guide-rail, of a paper-carriage frame having an obliquely-arranged guiding roll to bear on one side of said rail and an associated guiding roll arranged to bear on the opposite side of said rail, the construction and arrangement being such that the obliquely-arranged guiding roll is caused to constantly press against its side of the rail by the weight of the carriage, and the associated guiding roll to constantly press against its side of said rail by the drawing or wedging action of the obliquely-arranged guiding roll.

5. In a type writing machine, the combination of a guide-rail having plane sides, one of which is inclined, and a hinged paper-carriage provided with guide-rolls to bear upon said inclined side of the rail and also on the opposite side of the rail, the rolls on the inclined side of the rail operating under the weight of the carriage to draw or force the roll or rolls on the opposite side of the rail against the surface thereof, and the faces of all of the guide-rolls being parallel to their axes and to the sides of the rail against which they bear.

6. In a type writing machine, the combination of a guide rail having vertical and inclined sides, and a hinged paper-carriage having horizontally and obliquely arranged guide rolls.

7. In a type writing machine, the combination of a guide rail having a plane vertical side and a plane inclined side, and a paper-carriage having a pair of guide rolls whose faces and axes are both parallel with the vertical side of the guide rail, and an oppositely-arranged obliquely-disposed guide roll whose face and axis are arranged parallel with the inclined side of the guide rail.

8. In a type writing machine, the combination of a guide rail inclined on opposite sides at its upper portion and formed with straight and parallel sides below said inclined sides, and a paper-carriage provided with two pairs of guide rolls, one pair having vertical axes and faces to work in conjunction with the vertical parallel sides, and the other pair having oblique axes and faces to work in conjunction with the said inclined sides.

9. In a type writing machine, the combination of a guide rail having both inclined sides and vertical parallel sides, and a paper-carriage having two pairs of guide rolls, one pair having vertical axes and faces, and the other oblique axes and faces, and the rolls of each pair being arranged on opposite sides of the guide-rail.

10. In a type writing machine, the combination of a hinge-rod, a paper-carriage hinged upon said rod at its rear side and provided with a supporting roller, a set of horizontally and obliquely arranged guide rolls mounted

at the front side of said paper-carriage, and a guide-rail having inclined and vertical faces for said guide rolls to bear upon.

11. In a type writing machine, the combination of a shifting platen-carrier having a limited back and forth movement, a shift-rod, and a pivoted latch device, having on one side of its pivot a fork or yoke to embrace said shift rod and on the opposite side of its pivot means for locking or holding the platen-carrier firmly in its normal and in its shifted position.

12. In a type writing machine, the combination of a paper-carriage having a pair of stops, a shift-rod, and a shifting platen carrier having a pivoted latch comprising a pair of arms to engage said stops, and a pair of arms to embrace said rod.

13. In a type writing machine, the combination of a paper-carriage having a pair of stop-members provided each with an inclined ledge, a shift rod, a shifting platen-carrier provided with a pivoted latch to reciprocate between said ledges and also to vibrate about its horizontal pivot, and composed essentially of a pair of arms to engage said ledges, and a fork to engage said shift rod.

14. In a type writing machine, the combination of a paper-carriage having stops, a shift-rod, a shifting platen-carrier, a latch to lock said platen-carrier in either of its two positions and to be engaged by said shift-rod, and a spring adapted to break contact between the latch and the shift rod at the end of the stroke of the shift-rod in either direction.

15. In a type writing machine, the combination of a paper-carriage having a pair of stop-members provided each with an inclined ledge, a shift-rod, a shifting platen-carrier provided with a pivoted latch having a pair of arms, to engage said ledges, and a pair of arms or a fork to engage said shift-rod, and a spring for breaking the contact of said latch with said shift-rod at the end of the stroke of the latter in either direction.

16. In a type writing machine, the combination of a paper-carriage having a lateral shifting platen, two sets of stop-screws, the adjustable stop-members, the latch, the spring, and the shift-rod.

17. In a type writing machine, the combination of a paper-carriage, a shift-rod, a shifting platen-carrier provided with a fork or yoke to be engaged by said rod, and means for breaking said engagement at the end of the throw of the shift-rod in either direction.

18. In a type writing machine, the combination of a paper-carriage, a shift-rod, a shifting platen-carrier provided with a pivoted fork or yoke to be engaged by said shift-rod, and a spring for moving said fork or yoke independently, and breaking the engagement between it and the shift-rod at the end of the throw of the latter in either direction.

19. In a type writing machine, the combination of an inking ribbon, a ribbon-spool shaft arranged to revolve always in one direction, a ribbon spool mounted on said shaft to revolve either in the direction of rotation of said shaft or in the reverse direction, another ribbon spool shaft arranged to revolve alternately in opposite directions, a ribbon-spool mounted thereon to turn with said shaft in whichever direction the same may be rotated, a connecting-shaft arranged at right angles to said spool-shafts and provided at one end with a gear which meshes with a gear on the first mentioned shaft, in order that the connecting shaft may be rotated always in one direction, and provided at its opposite end with bevel gears adapted to be engaged alternately with a gear on the second mentioned spool-shaft, by endwise movements of the connecting-shaft, so as to turn the second mentioned spool shaft and its spool alternately in opposite directions.

20. In a type writing machine, the combination of an inking ribbon, a ribbon spool-shaft 50 arranged to be turned always in one direction by the carriage driving drum, a ribbon spool 54 mounted on said shaft to turn either with said shaft or in a direction opposite to that of said shaft, a bevel gear 52 on said shaft, a spool shaft 51, a spool 55 on said shaft mounted to turn always in one direction of rotation of its shaft, a bevel gear 53 on said shaft, a connecting-shaft 44 adapted to slide longitudinally and provided at the end with a bevel gear 46, which is always in engagement with the gear 52, whereby said shaft 44 is rotated always in the same direction, and provided at its opposite end with two bevel gears 47 and 48 adapted to be alternately engaged with the gear 53, and thereby rotate the shaft 51 and its spool alternately in opposite directions.

21. In a type writing machine, the combination of an inking ribbon, a pair of ribbon spool shafts, a pair of ribbon spools, a connecting shaft geared permanently to and driven by one of said shafts to revolve always in the same direction and adapted to actuate the other of said shafts alternately in opposite directions, and means, substantially as described, for automatically moving said connecting-shaft endwise to reverse the direction of movement of the ribbon.

22. In a type writing machine, the combination of an inking ribbon, a pair of ribbon-spool shafts, a pair of ribbon-spools, a connecting-shaft arranged to revolve always in one direction and to move longitudinally to reverse the direction of rotation of one of said spool shafts, a bevel gear on each of said spool shafts, a bevel gear at one end of said connecting shaft, two bevel gears at the opposite end of said connecting shaft, a worm on the latter, a worm wheel having a cam and a concentric ledge, a lever connected to said connecting shaft, a spring for vibrating

said lever in one direction, and a stronger spring for vibrating the lever in the opposite direction.

23. In a type writing machine, having an inking ribbon and ribbon spools and a shaft as 44 for actuating said spools, the combination of a worm, a worm wheel provided with a cam and a concentric ledge, a spring 60, a lever 59 connected to said shaft and having a pin 72, and a spring 61.

24. In a type writing machine, the combination of an inking ribbon, a ribbon-spool shaft 50, arranged to turn always in one direction, a ribbon-spool 54 thereon arranged to turn in either direction, a bevel gear 52 on said shaft, a shaft 44, a bevel gear 46 thereon to engage with the gear 52 to turn the shaft 44 always in one direction, bevel gears 47 and 48 at the opposite end of said shaft 44 engaging alternately with a gear 53 on a ribbon spool-shaft 51 having a ribbon-spool 55 mounted to turn always in the direction of rotation of its shaft, whereby the longitudinal movements of the ribbon are effected, a cam on the shaft 51, a vibratory spring actuated ribbon-carrier having a ribbon-guide adapted to be actuated by said cam, whereby the ribbon is moved step-by-step laterally during its longitudinal movement, a worm 49 on the shaft 44, a worm wheel having a cam and a concentric ledge, a lever 59 connected to said shaft, and springs 60 and 61 whereby the directions of movement of the ribbon are reversed.

25. In a type writing machine, the combination of a paper-carriage having a platen, a circular series of type-bars having the general plane of their pivots arranged substantially coincident with the plane of the under side of the platen and having the pivots of those type bars at each side over which the platen travels, depressed or sunken below the general plane of the pivots and the under side of the platen.

26. In a type writing machine, the combination of a paper-carriage having a platen, a type-bar disk having a sunken or depressed portion at each side in line with the path of travel of the platen, a circular series of type bars mounted upon said disk, the pivots of the type bars over which the platen travels being mounted on said depressed or sunken portions, and the pivots of the remaining type bars being mounted upon the raised portions of the disk and substantially coincident with the plane of the under side of the platen.

27. In a type writing machine, the combination of a paper-carriage having a platen, a type-bar disk having a depressed or sunken portion at each side in line with the path of travel of the platen, a circular series of type bar-hangers mounted upon the depressed or sunken portions and upon the raised portions of the disk, and a series of type bars having the pivots of those bars whose hangers are mounted upon the raised portions of the disk arranged substantially coincident with the plane of the under side of the platen.

28. In a type writing machine, having a paper-carriage, the platen cylinder of which is moved over some of the type bar pivots, the arrangement of these pivots in a plane far enough below the general plane of the type bar pivots, whereby the upper pivots and the bottom of the platen cylinder may be placed in the same plane.

29. In a type writing machine, the combination of a paper-carriage having a platen, a hinged frame, and a pair of independent paper-guide roll supports mounted thereon and provided each with paper-guiding and feeding rolls.

30. In a type writing machine, the combination of a paper-carriage having a platen, a hinged frame, and a pair of guide roll supports adjustable longitudinally of said frame for different widths of paper and provided with paper guiding and feeding rolls.

31. In a type writing machine, the combination of a paper-carriage having a cylindrical platen, a spring-actuated hinged frame, and a pair of curved paper-guide roll supports mounted on said frame and provided each with a pair of guiding and feeding rolls.

32. In a type writing machine, the combination of a paper-carriage having a cylindrical platen, a hinged spring-actuated frame arranged on the under side thereof, and a pair of curved paper guide roll supports adjustable longitudinally of said frame and provided each with a pair of guiding and feeding rolls, one roll of each pair being arranged on one side of the vertical axis of the platen, and one roll on the other side of said axis.

33. In a type writing machine, the combination of a paper-carriage having a platen, the arms 113, the shafts 112 and 114, the paper guide roll supports 115, the guide rolls, and the springs 116.

34. In a type writing machine, the combination of a paper-carriage having a platen, a guide roll having journals, and a guide roll support consisting of the flexible band 118, the journal box 119, and the spring cap 120.

35. In a type writing machine, the combination of a paper-carriage having a platen, a guide roll having journals, and a guide roll support having a journal-box made of a single piece of sheet metal provided with notches and folded ends, whereby end and side bearings are formed for the roll journals.

36. In a type writing machine, the combination of a main carriage having a platen-carrier adapted to be shifted transversely thereon, and a spring-pressed scale hinged to the main carriage.

37. In a type writing machine, the combination of a main paper carriage, a shifting platen carrier, a paper-guide and table 123, hinged upon a rod as 112, and a spring pressed scale bar hinged to the main carriage.

38. In a type writing machine, the combination of a paper-carriage having a platen, a letter-spacing mechanism, one part of which is carried by a vibratory frame, a line spacing mechanism, a relatively fixed carriage-stop, and a spring-actuated lever, to act on said vibratory frame, having both a rocking and a rectilinear movement, and connected to said line-spacing mechanism.

39. In a type writing machine, the combination of a paper-carriage having a platen, a letter spacing mechanism, one part of which is carried by a vibratory frame, a line-spacing mechanism, a relatively fixed carriage-stop, a lever as 87, and a lever as 83 mounted on the paper-carriage.

Signed at Ilion, in the county of Herkimer and State of New York, this 19th day of September, A. D. 1892.

LOUIS P. DISS.

Witnesses:
GEO. O. RASBACH,
GEO. H. DYETT.