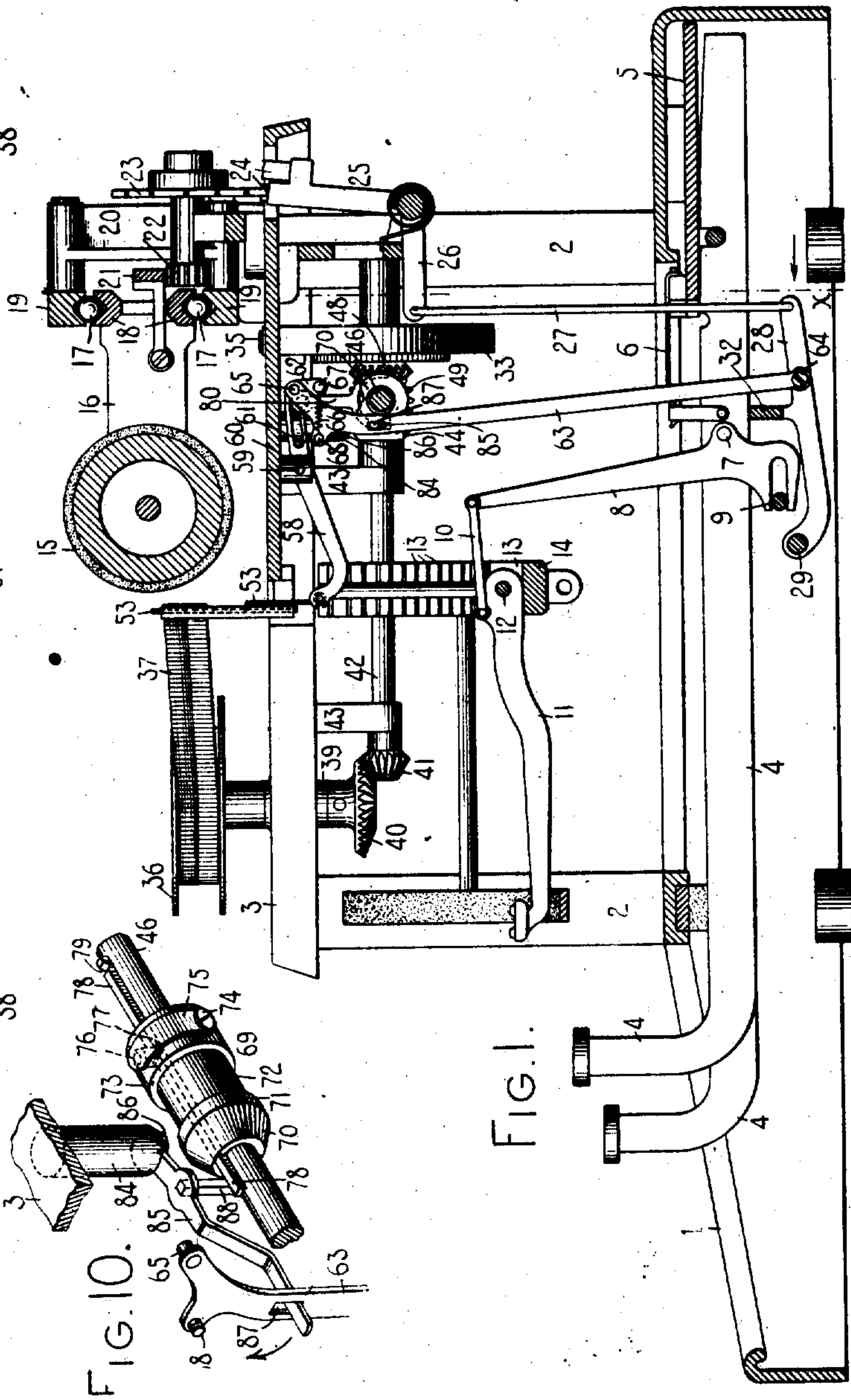
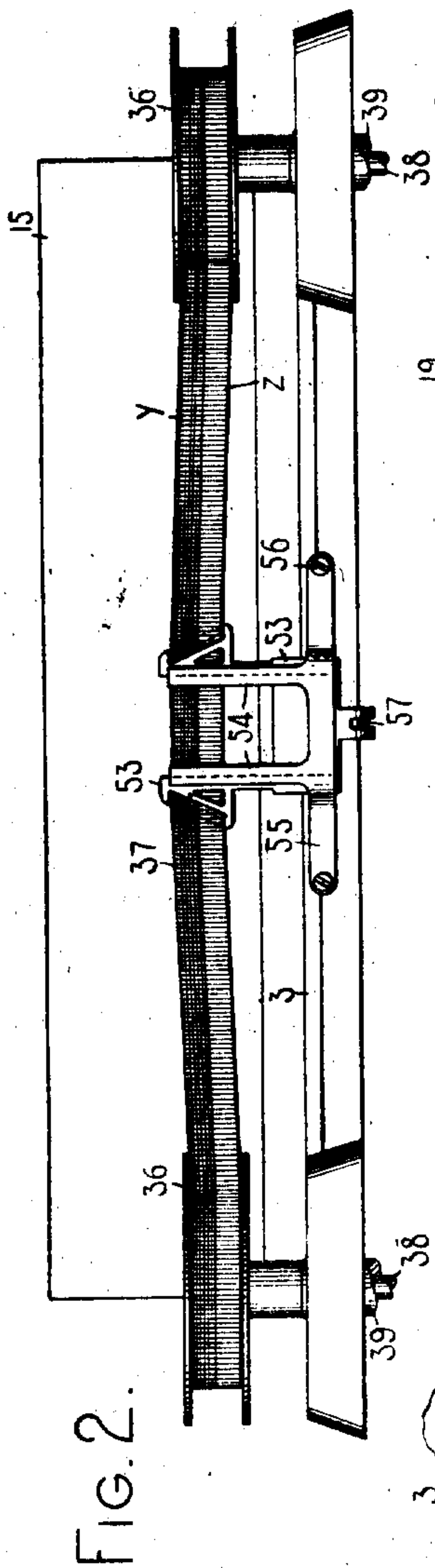


901,259.

M. W. POOL.
TYPE WRITING MACHINE.
APPLICATION FILED MAR. 15, 1905.

Patented Oct. 13, 1908.
4 SHEETS—SHEET 1.



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901,259.

M. W. POOL.
TYPE WRITING MACHINE.
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4 SHEETS—SHEET 2.

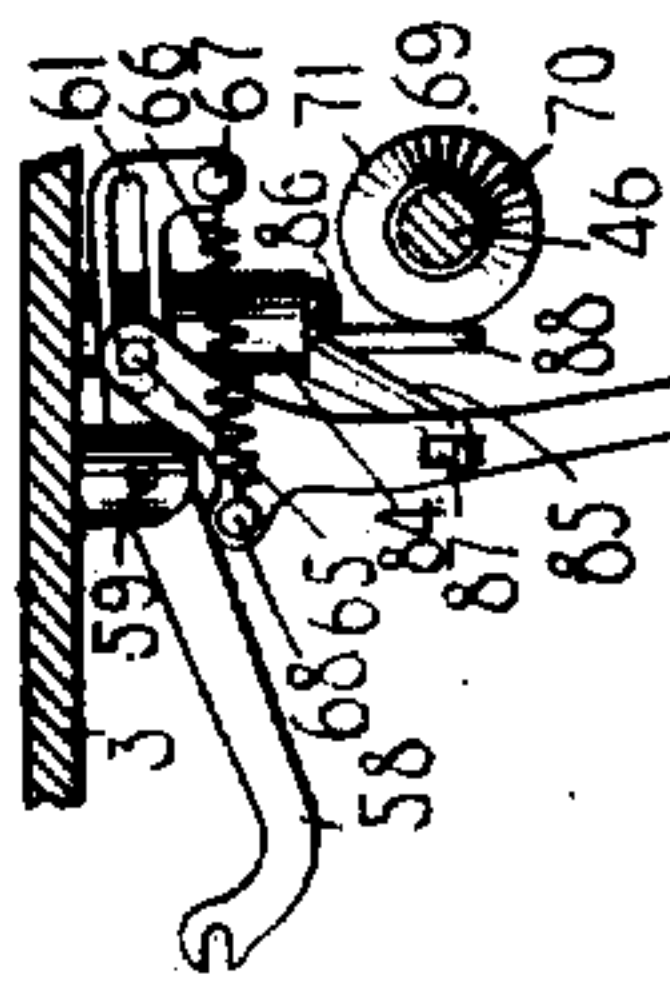
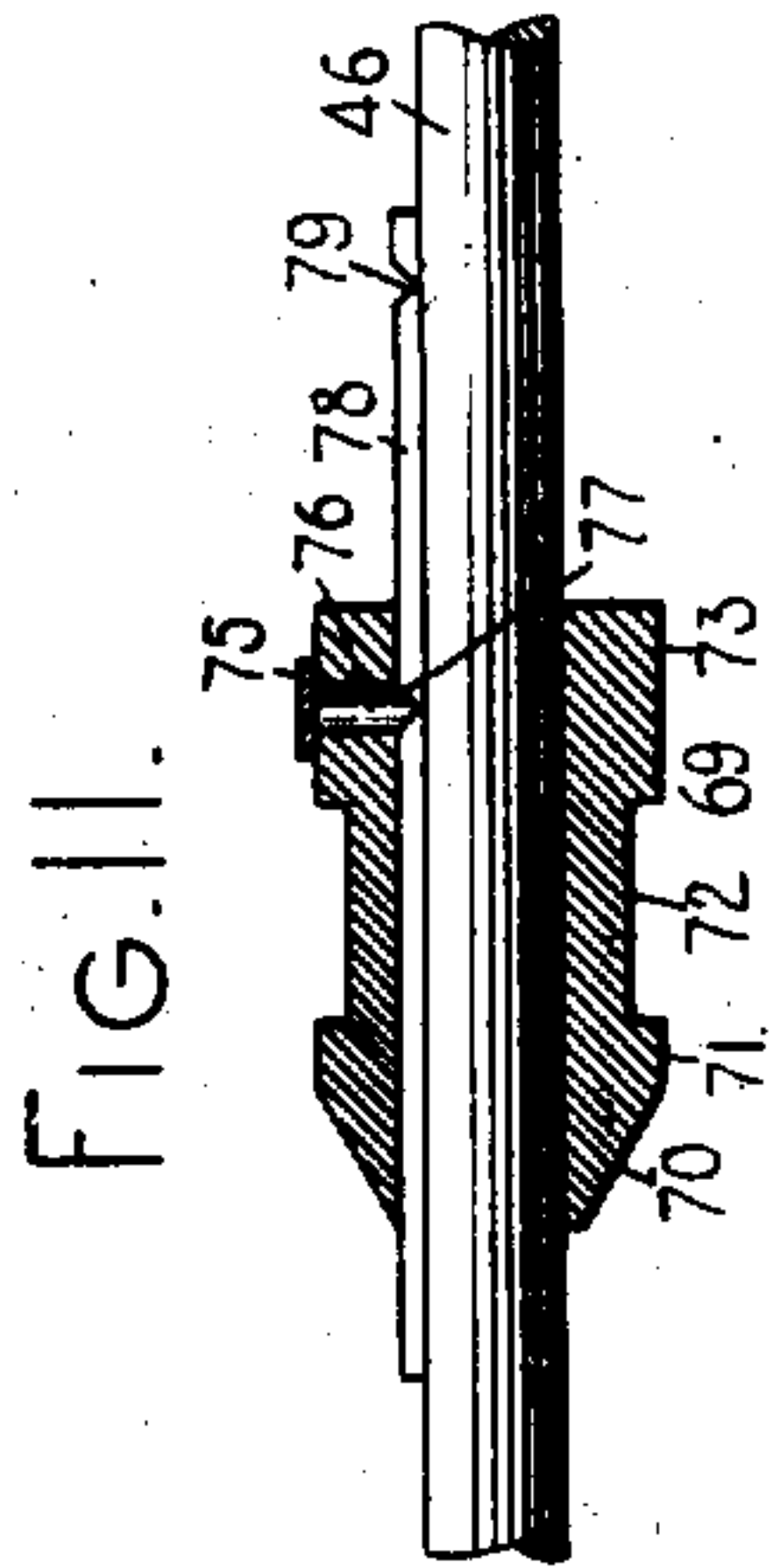


FIG. 5.

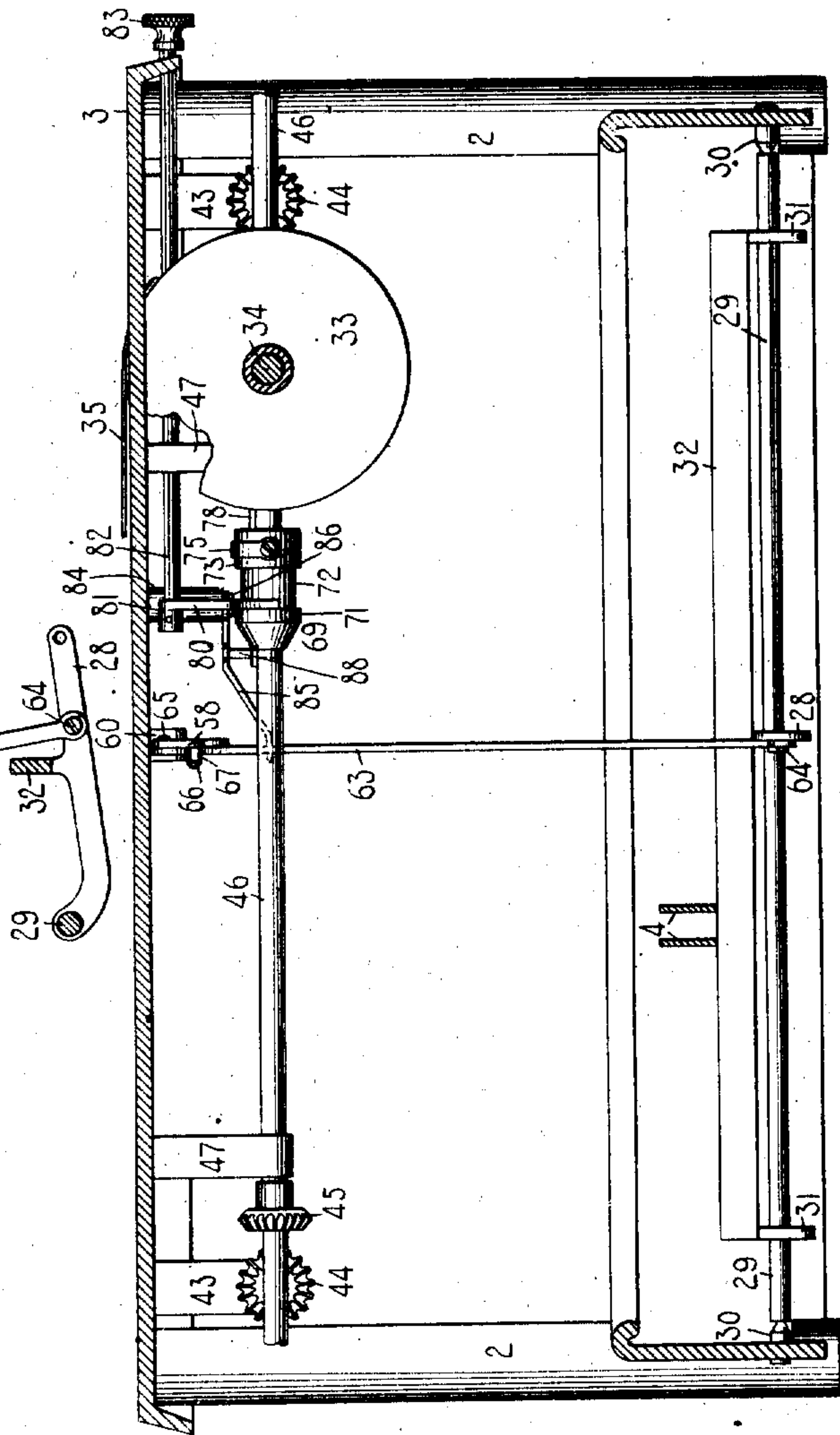


FIG. 3.

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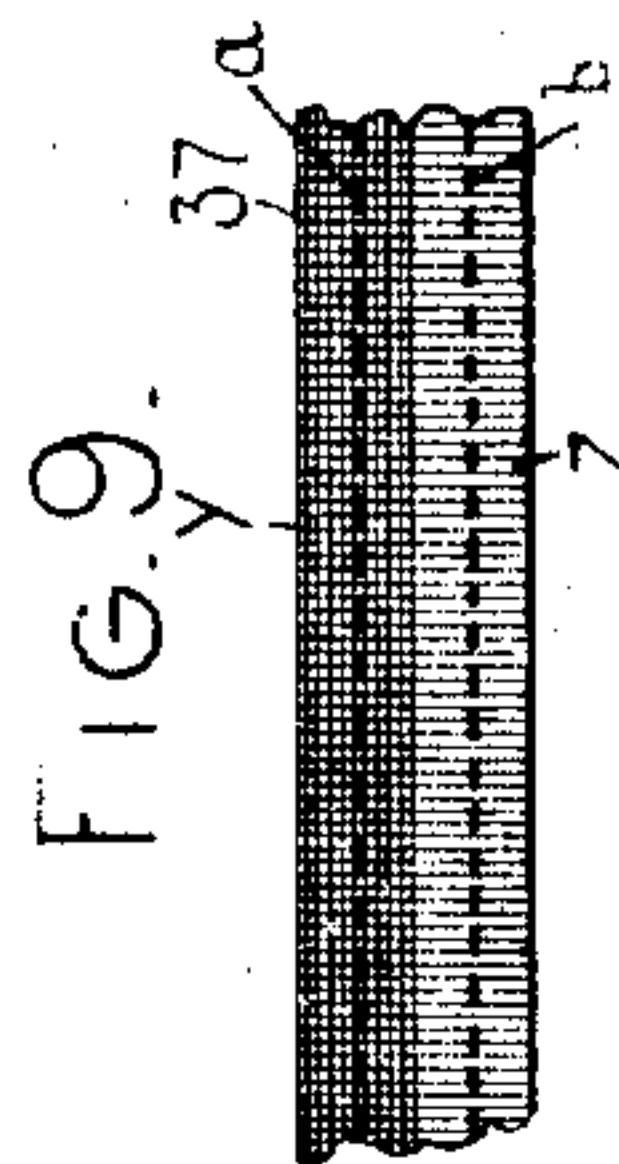
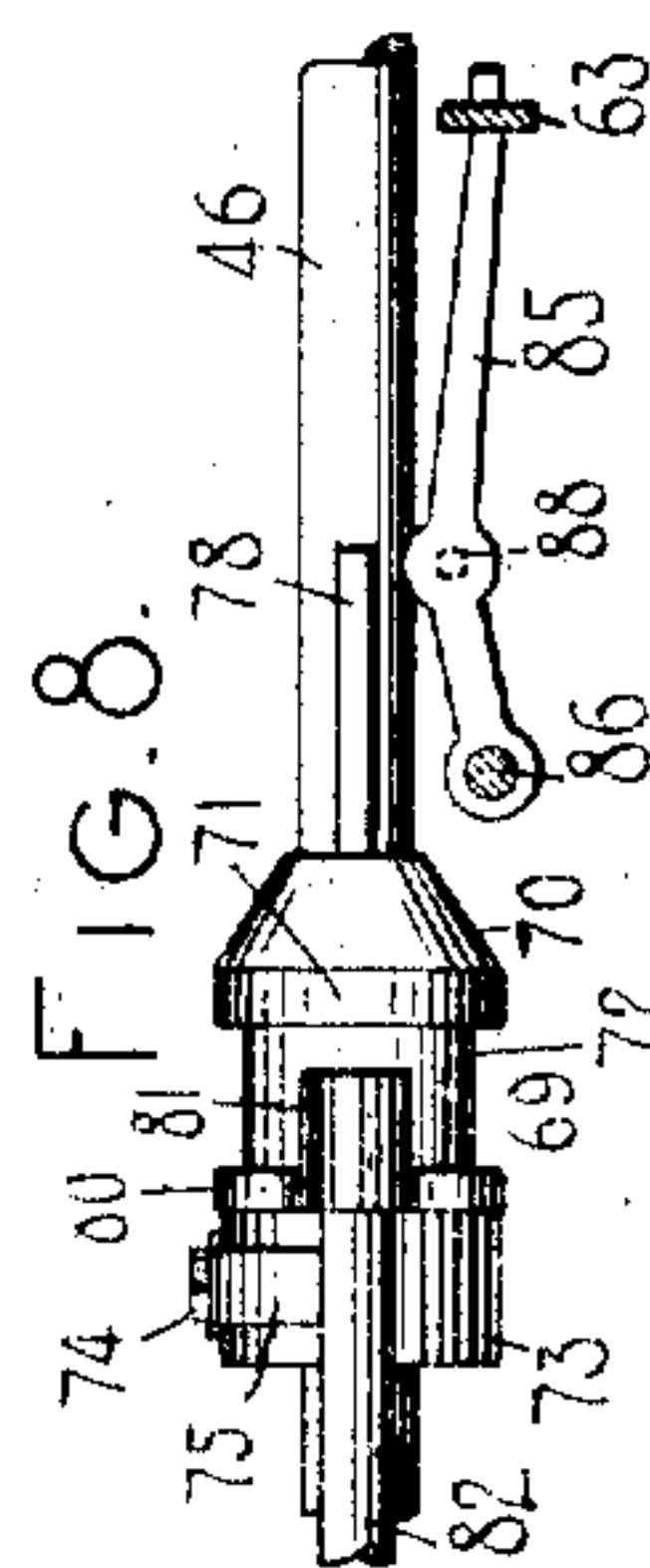
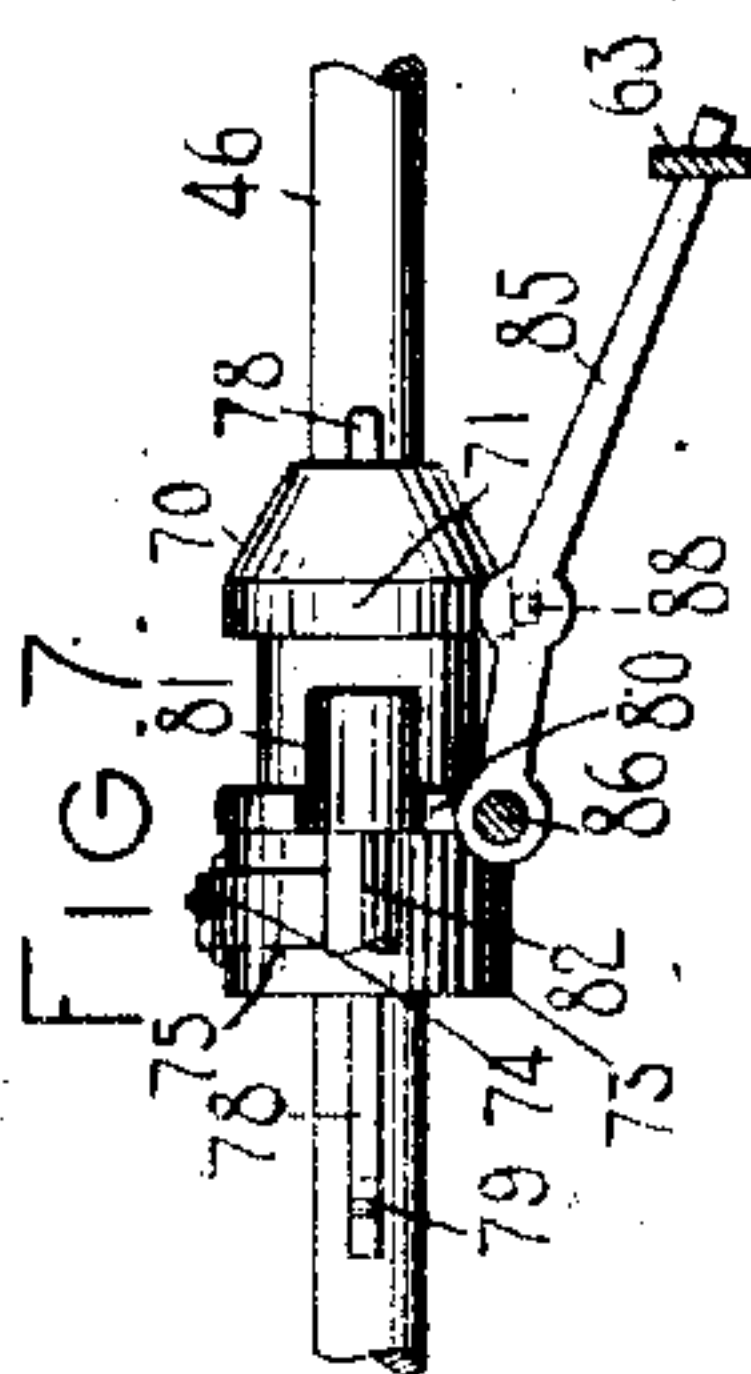
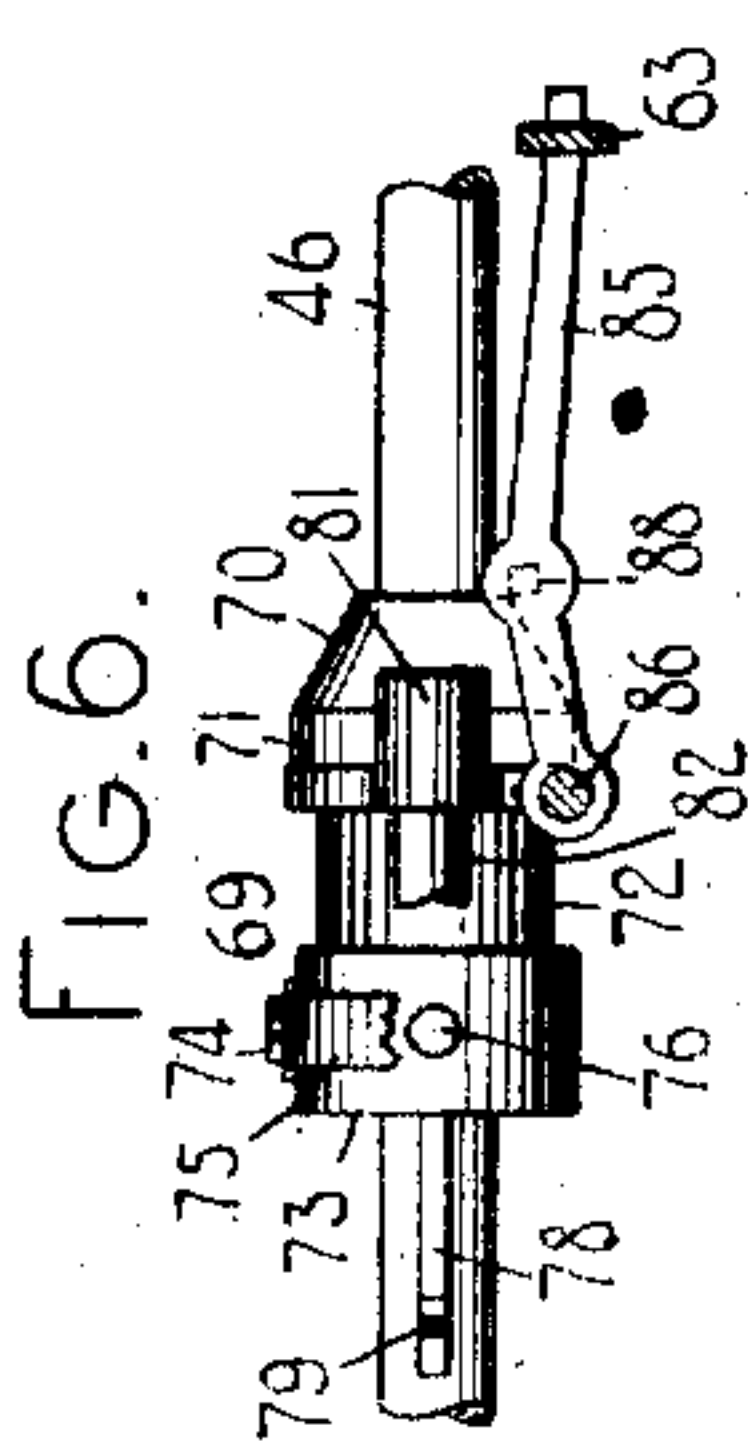
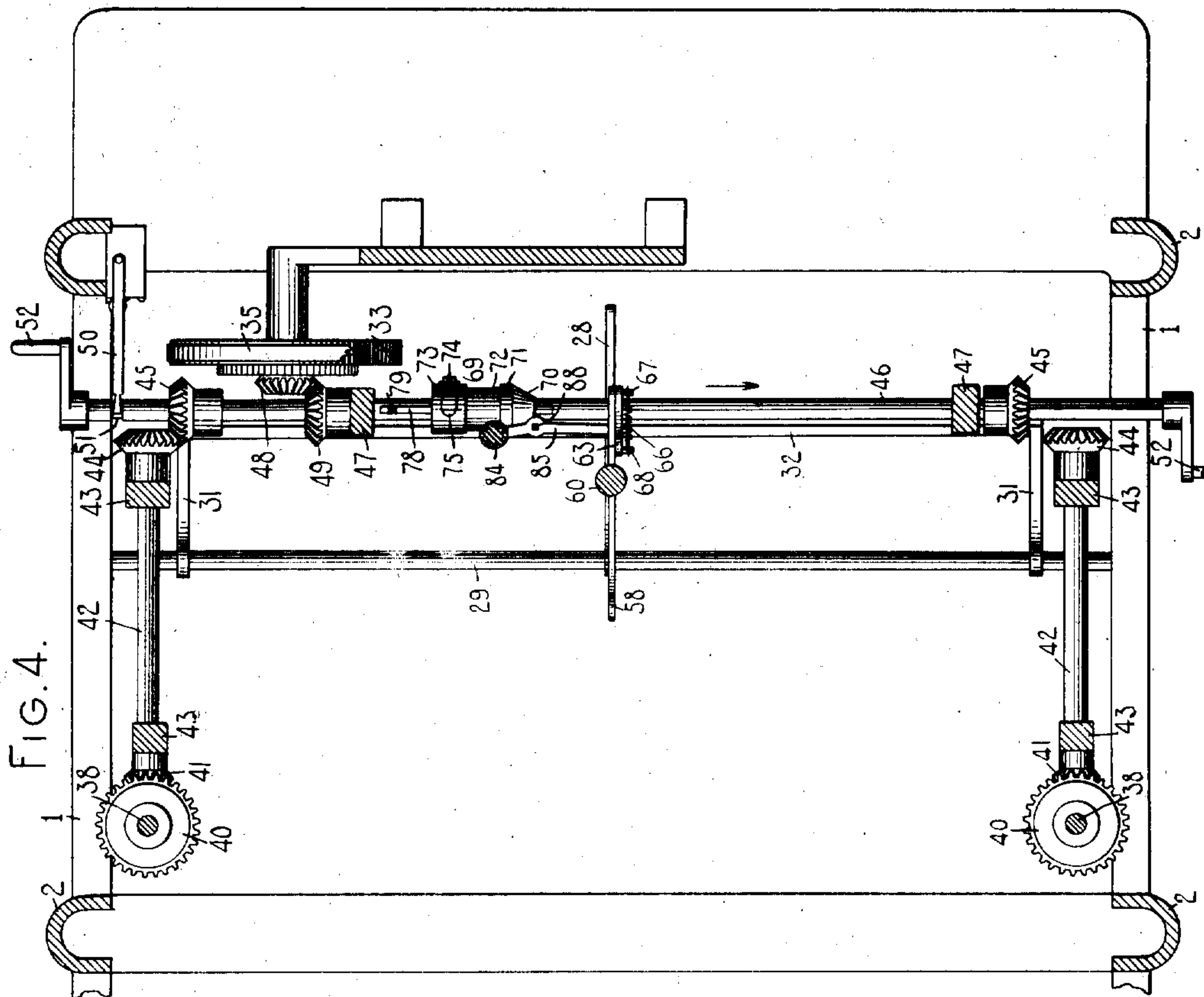
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901,259.

M. W. POOL.
TYPE WRITING MACHINE.
APPLICATION FILED MAR. 15, 1905.

Patented Oct. 13, 1908.
4 SHEETS—SHEET 3.



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901,259.

M. W. POOL.
TYPE WRITING MACHINE.
APPLICATION FILED MAR. 15, 1905.

Patented Oct. 13, 1908.
4 SHEETS—SHEET 4.

FIG. 12.

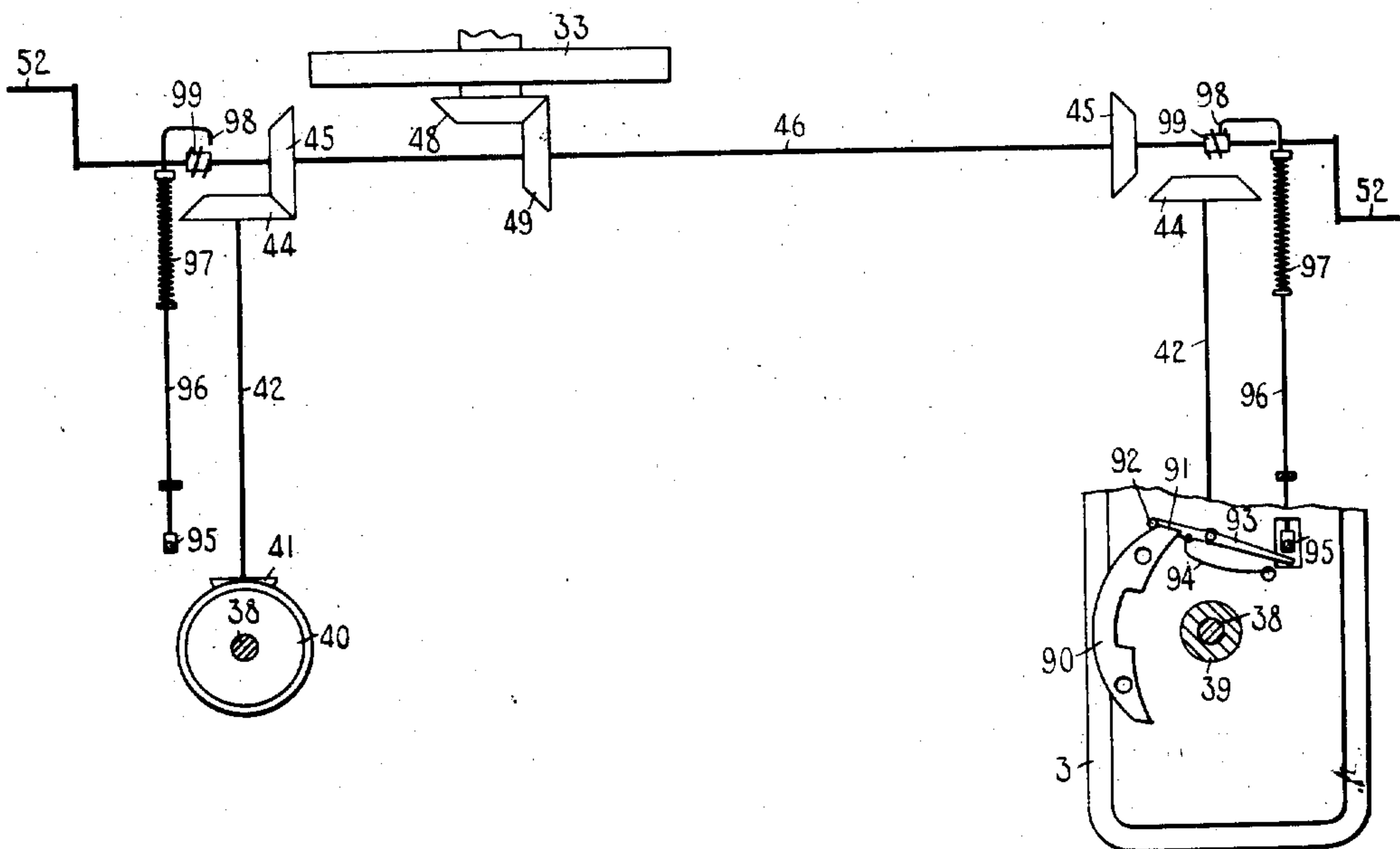


FIG. 13.

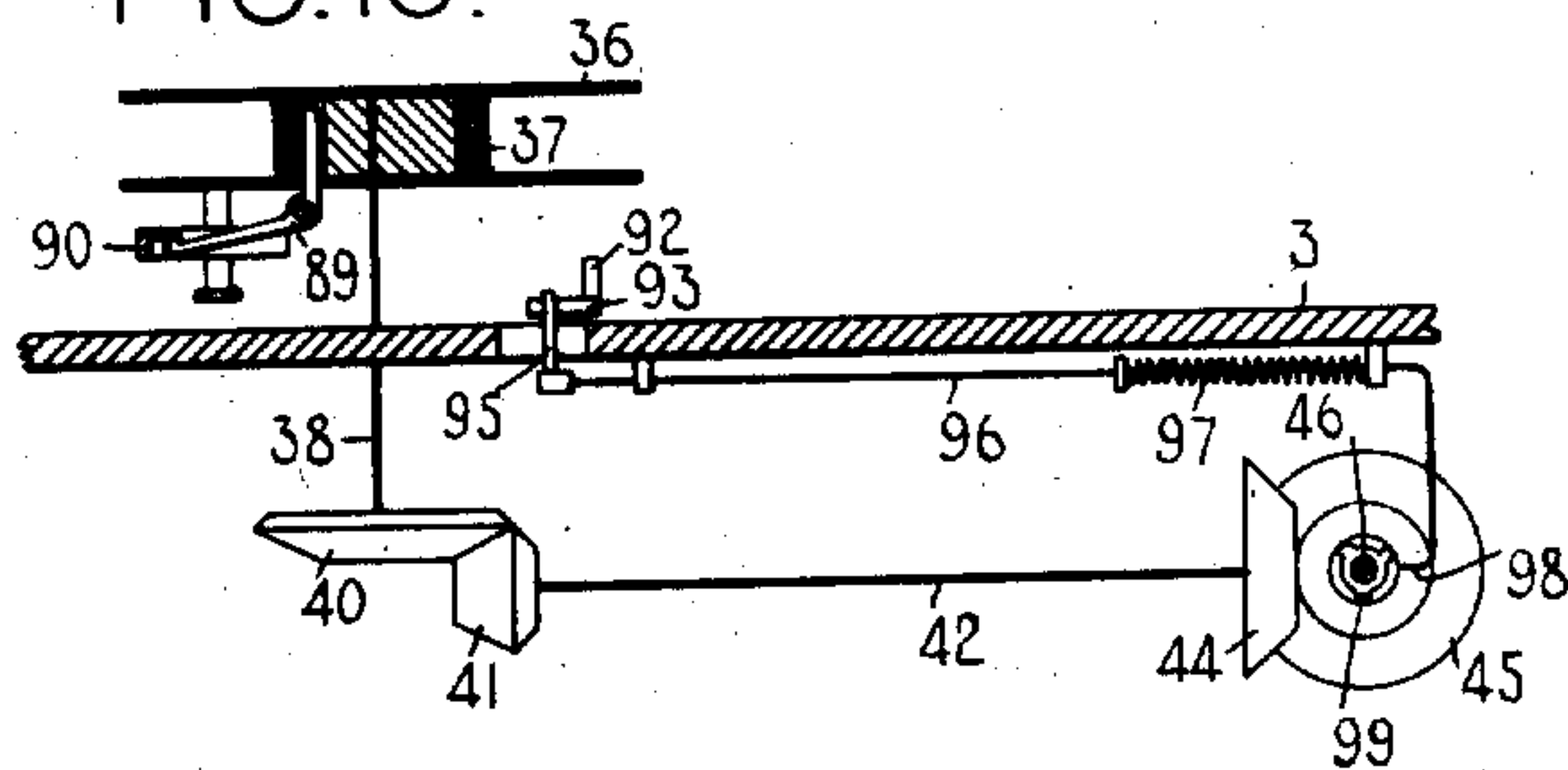
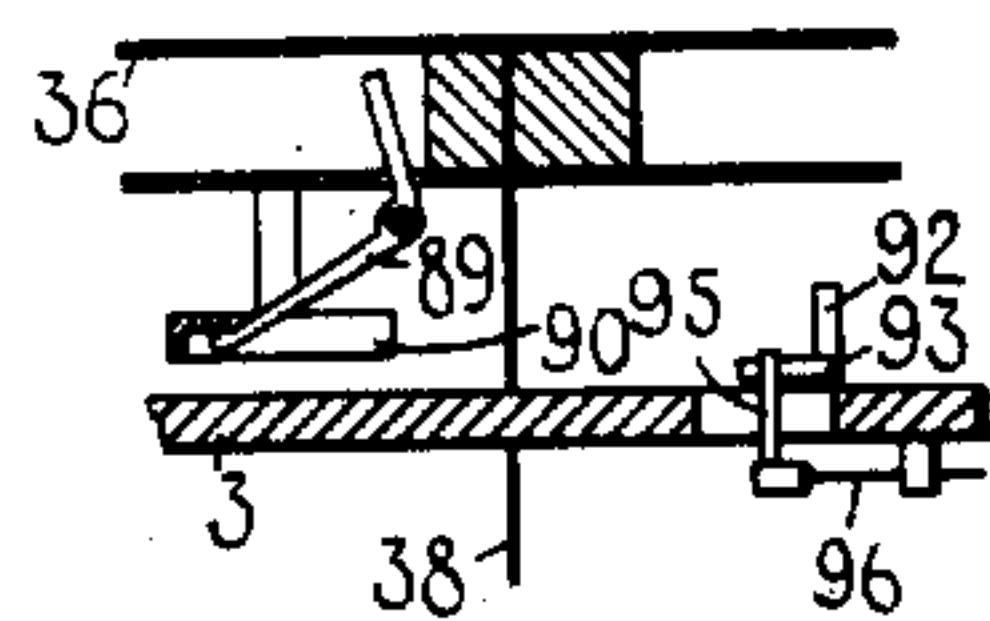


FIG. 14.



WITNESSES:

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UNITED STATES PATENT OFFICE.

MORRIS W. POOL, OF NEW YORK, N. Y., ASSIGNOR TO THE MONARCH TYPEWRITER COMPANY,
OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

No. 901,259.

Specification of Letters Patent.

Patented Oct. 13, 1908.

Application filed March 15, 1905. Serial No. 250,212.

To all whom it may concern:

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

My invention relates more particularly to the ribbon mechanism of those machines wherein the writing is visible to the operator as it is written. In such machines the ribbon is usually controlled by a ribbon vibrator, which term, as herein employed, comprehends any device for moving the ribbon automatically to cover the printing point and for affording a movement of the ribbon to uncover the printing point. In my pending application Serial No. 247,474, filed February 27th, 1905, I have shown means to so move the vibrator as to cause the type impressions to follow a plurality of predetermined paths longitudinal of the ribbon and parallel with each other.

The main object of my present invention is to so improve the invention disclosed in said pending application as to enable a ribbon having a plurality of fields of different characteristics to be readily and practically employed therewith.

Other objects will subsequently appear.

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

In the accompanying drawings, Figure 1 is a vertical front to rear sectional view, taken about centrally, of one form of type-writing machine embodying my invention, parts of the machine being omitted. Fig. 2 is a fragmentary front elevation of the upper part of the machine. Fig. 3 is a sectional rear view taken on a plane represented by the line x of Fig. 1. Fig. 4 is a fragmentary top plan view of the machine with the top plate thereof removed or sectioned away, the parts shown being positioned as in Fig. 3. Fig. 5 is a side elevation showing parts of the ribbon mechanism, some of said parts being in different positions from those in which they appear in Fig. 1. Fig. 6 is an enlarged top plan view, looked at from the front, of some of the elements of the ribbon mechanism positioned as in Figs. 3 and 4. Fig. 7 is

a view similar to Fig. 6, but showing the parts positioned as in Fig. 5. Fig. 8 is a view similar to Figs. 6 and 7, but showing one of the elements of the ribbon mechanism, hereinafter called a switching member, in inoperative position. Fig. 9 is an enlarged diagrammatic view showing the paths of the type impressions on the ribbon. Fig. 10 is an enlarged perspective view of parts of the ribbon mechanism as they appear in Figs. 3 and 4. Fig. 11 is an enlarged rear sectional view of parts of the ribbon mechanism positioned as in Fig. 3. Figs. 12, 13 and 14 are diagrammatic views of the automatic ribbon reversing mechanism.

The invention is shown as applied to a Monarch typewriting machine and it is therefore not considered necessary to refer other than briefly to the general structure shown in the drawings. It is to be understood, however, that the invention may be adapted to other forms of writing machines.

Considering first Figs. 1 to 11, inclusive, the frame of the machine is shown as composed of a base 1, posts 2 and a top plate 3, the posts being secured to the base and the top plate being fixed on the posts. Key levers 4 are fulcrumed on a fulcrum plate 5 secured in the rear of the base, each key lever being provided with a restoring spring 6. Pivoted at 7 to each key lever is a sub-lever 8, the lower portion whereof is adapted to cooperate with a fixed abutment 9, the upper end of said sub-lever being connected by a link 10 with a type bar 11. The said type bar is one of a segmentally arranged series which may be fulcrumed on a curved fulcrum wire 12. Each type bar may be guided in a radial slot 13 formed in a segmental type bar support 14. Instead of the construction herein shown, the type bars may be provided with other styles of pivots and hangers as desired. The type bar segmental support illustrated is of the shifting variety and is designed to be shifted for changing case by known mechanism. It is immaterial, however, for the purposes of this invention whether the segment be shiftable or whether it is of the non-shifting kind or style. The type bars 11 are designed to cooperate with a rotary platen 15 mounted in a carriage 16 which travels on balls 17 confined in grooves formed in the carriage bars or rails 18 and in oppositely grooved bars 19 fixed to stationary brackets 20. The carriage 16 is provided

with a feed rack 21 which normally meshes with a pinion 22, the latter being operatively connected with an escapement wheel 23, the teeth whereof are adapted to cooperate in a known manner with escapement dogs 24 mounted in a pivoted dog rocker 25. The dog rocker 25 is provided with a horizontally disposed arm 26, the forward end of which is connected by a link 27 with an arm 28 projecting rearwardly from the central part of a pivot rod 29 having bearings in fixed pivots 30. Near its ends the pivot rod 29 is provided with rearwardly projecting side arms 31 which, together with the arm 28, support an universal bar 32, the latter extending from side to side of the machine beneath the series of key levers and spacing levers (not shown) and being designed to be swung downward about its pivot whenever any of said levers are depressed during the operation of the machine and to be restored to normal position by a spring (not shown) when the lever is released. A spring drum 33 having a pivot 34 turning in a fixed bearing, is connected by a strap 35 with the carriage 16 and tends constantly to draw said carriage leftward across the top plate. Whenever the universal bar is adequately depressed the feed dogs 24, cooperating with the other escapement members in a known manner, permit the carriage to move one letter space leftward.

Ribbon spools 36 are pivotally mounted above the top plate of the machine, one at each side thereof and forwardly of the platen. A ribbon 37 is wound upon said spools and passes from one to the other in front of the platen. Each ribbon spool is fixed to the upper end of a vertical shaft 38 which rotates in a fixed bearing 39, said shaft being provided at its lower end with a small beveled gear 40. Meshing with the beveled gear 40 is a beveled pinion 41 secured to the forward end of a horizontally disposed shaft 42 adapted to rotate in fixed bearings 43 and having fixedly secured to its rear end a beveled pinion 44. Adapted to cooperate with the pinion 44 is a driving pinion 45 fixedly secured on a driving or power shaft 46 which extends from side to side of the machine beneath the top plate and is slidably mounted in fixed bearings 47. The driving shaft 46 is connected with and is caused to rotate by the spring drum 33 through beveled pinions 48 and 49, the first named pinion being caused to rotate with the spring drum when the latter draws the carriage leftward and the pinion 49 being so connected with the driving shaft 46 that the latter is caused to rotate with said pinion but has endwise motion independently thereof.

It will be understood that each ribbon spool is connected as above described with a beveled pinion 44, there being one of the latter at each side of the machine as seen in Fig. 4. The beveled driving pinions 45 are so ar-

ranged upon the driving shaft 46 that only one of said driving pinions is engaged at a time with its associate pinion 44. To accomplish the alternate engagement of the driving pinions 45 with their respective associate pinions 44 and thereby to cause the ribbon to wind from one spool to the other and vice versa, the power shaft 46 is given a longitudinal movement to and fro. The preferred means of causing this to and fro longitudinal movement of the driving shaft is that shown in the U. S. Patent to Jacob and Carl Gabrielson No. 703,339, dated June 24, 1902 and which will be hereinafter described. With the parts arranged as shown in Fig. 4 of the present application the ribbon may be caused to wind on the lefthand ribbon spool and wind off the right hand spool by means such as those explained in the above cited patent. When all the ribbon has been wound off the right hand ribbon spool the shaft 46 may, by the means explained in said patent, be shifted longitudinally in the direction of the arrow in Fig. 4 so as to cause the right hand driving pinion 45 to engage with its pinion 44 and the left hand driving pinion 45 to disengage from its associate pinion. The direction of the longitudinal feed of the ribbon is thereby reversed and the latter is caused to wind on the right hand spool and off the left hand spool. A pivoted vibratory spring pressed detent 50, engaging with a circumferential depression 51 in the driving shaft 46, serves to retain the latter in either of its working positions and has the additional function of assisting to shift said shaft from one working position to the other. I do not desire to be limited to the means for reversing the ribbon winding or longitudinal feed mechanism explained in said patent. Any other automatic reversing means may be used with my invention or the ribbon may be manually reversed as by pulling out or pushing in the handles 52 secured to the ends of the driving or power shaft 46 and ordinarily employed for rapidly winding the ribbon.

Centrally of the machine the ribbon is threaded through a ribbon vibrator or vibratory carrier 53 which is guided and supported in grooves in the upright arms 54 of a supporting bracket 55 secured to the frame of the machine by screws 56. The lower end of the vibrator 53 is bifurcated and is provided with a cross pin 57 with which engages the slotted forward arm of an operating lever 58 fulcrumed at 59 in a lug 60 depending from the under side of the top plate. The rear arm of the operating lever 58 is formed with a slot 61 and terminates in a depending portion 62. An actuating link 63 is pivotally connected at 64 with the arm 28 of the universal bar frame, and said actuating link is provided at its upper end with a projecting pin or stud 65 which engages with the slot 61 in the operating lever. A horizontally disposed spiral

spring 66, connected at its rear end to a pin 67 in the part 62 of the operating lever and connected at its forward end to a pin 68 in the link 63, tends constantly to draw said link rearwardly about its pivot 64 and to maintain the stud 65 at the rear end of the slot 61, as indicated in Fig. 1.

Mounted on the driving shaft 46 a short distance to the left of the actuating link 63, is a switching member or link controller 69 which comprises a cone-like camming portion 70, a circular working face 71, a comparatively wide depressed portion 72 and a collar portion 73. Secured to the collar portion 73 by a headed screw 74 is an arc-shaped band spring 75, the free end of which is provided with a locking pin 76 which enters a perforation in the collar portion 73, as best appears in Figs. 10 and 11. The inner end of the pin 76 is beveled or wedge shaped and normally engages a notch or depression 77 in a spline 78, said spline being integral with the driving shaft 46 and extending lengthwise of the latter and through a longitudinal groove in the switching member 69. The latter is thereby caused to rotate with the driving shaft 46 and is held in a predetermined position lengthwise of the latter by reason of the engagement of the locking pin 76 with the notch 77. The spline 78 is provided with a second notch or depression 79 some distance to the left of the notch 77, and the switching member 69 is adapted to be moved leftward lengthwise of the driving shaft 46 so as to cause the locking pin 76 to disengage from the notch 77 and to engage with the notch 79. The means shown to longitudinally position the switching member 69 comprises a forked member 80, the lower bifurcated end whereof is adapted to loosely embrace the depressed portion 72 of the switching member and the upper end of which is provided with a perforated collar portion 81 in which is fixedly secured the inner end of a frictionally mounted slide rod 82. As appears in Fig. 3 the slide rod 82 extends outwardly, passing through and bearing frictionally in the left hand lug 47 and in the depending lip of the top plate and terminates exteriorly of the machine in a knurled finger button 83.

As most clearly appears in Fig. 10, a bearing lug 84 depends from the under side of the top plate 3 somewhat forward of the switching member 69 and terminating slightly above the latter. A rotary switching arm 85 is mounted on a screw pivot 86 which screws into the bottom face of the lug 84. The switching arm 85 extends rightward from its pivot and is bent downwardly so that its outer end engages with a rectangular slot 87 formed in the upper part of the link 63. A short distance to the right of the pivot 86 the arm 85 is provided with a depending lug 88 which is adapted to co-act with the faces 70

and 71 of the switching member in a manner now to be described.

When the parts are positioned as shown in Figs. 3, 4, 6 and 10, with the locking pin 76 of the switching member 69 in engagement with the notch 77 in the driving shaft and the left-hand driving pinion 45 in engagement with its associate pinion 44, the link 63 will be drawn by the spring 66 as far as possible from the fulcrum of the operating lever 58, the pin 76 being at the rear of the slot 61. The result is that when a key lever 4 is adequately depressed, the link 63 will swing the forward end of the operating lever upward to its least height. With the parts arranged as in said figures, the throw of the ribbon vibrator is a constant one and the mechanism is so proportioned and adjusted that the type impressions will follow a path lengthwise of the ribbon, as indicated by the dotted line *a* (Fig. 9). The ribbon 37 shown in the drawings is one having a plurality of fields of different characteristics, being made up of two longitudinal stripes or sections *y* and *z*. For purposes of illustration it will be assumed that the stripes *y* and *z* are colored respectively black and red, but it is to be understood that they may be colored in any other way or may instead differ in any other desired respect. It will be noted from an inspection of Fig. 9 that with the parts positioned as last described, the path *a* follows a course along the middle and longitudinally of the upper or black stripe *y*. With the pin 76 of the switching member 69 engaged with the notch 76 of the driving shaft, as now being considered, the types will ordinarily contact with the ribbon along the path *a* until the right hand ribbon spool is empty.

When the ribbon has been completely unwound from the right hand spool, the power shaft 46 is shifted longitudinally in the direction of the arrow in Fig. 4, in a manner heretofore referred to, until the right hand beveled gears 45 and 44 are in mesh and the corresponding left hand gears are out of mesh, thereby reversing the longitudinal feed of the ribbon and causing the latter to wind on the right hand spool and off the left hand spool. As the shaft 46 moves in the direction of the arrow in Fig. 4, the shifting member 69 moves with the shaft and the cone-like cam portion 70, engaging with the lug 88 of the rotary arm 85, will swing the latter forwardly about its pivot in the direction of the arrow in Fig. 10. Because of the engagement of the outer end of the arm 85 with the slot 87 in the link 63, the latter will be swung forwardly about its pivot 54 against the pull of the draw spring 66. The parts are so proportioned and arranged that when the shifting member 69 has reached the limit of its rightward movement, the lug 88 will have been cammed or swung forward about its pivot 86 so as to engage with the

circular face 71 of the switching member 69 and the link 63 will have been swung forward about its pivot 64 against the pull of the draw spring 66 until the stud 65 is at the forward end of the slot 61. The rotary arm 85 serves to transmit an increased movement due to the throw or switching movement of the switching member, so that though the cone face 70 cams the lug 88 but a short distance from the driving shaft, yet the end of the arm 85 serves to move the stud 65 all the way from the rear of the slot 61 to the front of said slot. The parts will now be in the position indicated in Figs. 5 and 7. It will be noted from an inspection of the first-named figure that the link 63 will now be engaged with the operating lever 58 nearer the fulcrum 59 of the latter than in the first instance, so that when the forward end of said lever is swung upward during printing operation in a manner heretofore explained, it will carry the ribbon to a greater height than when the stud 65 is at the rear of the slot 61. As the printing keys are operated the switching member 69 will rotate with the power shaft and the circular face 71 will turn in contact with the lug 88. The stud 65 and the actuating link will consequently be maintained at a fixed and predetermined distance from the fulcrum 59 of the operating lever and the forward arm of the latter will be swung upward at printing operation so as to present the lower stripe *z* of the ribbon to the types. The paths of the type impressions will be in a straight line longitudinal of said stripe and parallel with the path *a*, said path being represented by the reference *b* (Fig. 9.)

If the relations of the parts be left unchanged, the type impressions will ordinarily follow the path *b* until the ribbon has been completely unwound from the left hand ribbon spool, after which the driving shaft 46 will be moved back longitudinally to the first described position with the left hand pinions 45 and 44 in engagement, thereby again reversing the longitudinal feed of the ribbon. The switching member 69 returns with the driving shaft and as it does so, the draw spring 66 will swing the link 63 rearwardly about its pivot 64 until said link reaches the position shown in Figs. 1 and 10 while at the same time the arm 85 will be swung rearwardly about its pivot 86 to the position indicated in said figures. With the arm 85 and link 63 so positioned the type impressions will again follow the path *a*.

It will be understood that while the hitherto described relation between the switching member 69 and the driving shaft 46 is maintained, it is only necessary, when it is desired to shift from the black to the red printing field, to shift the driving shaft 46 in the direction of the arrow in Fig. 4 by pulling out the right-hand ribbon winding handle 52 or

pushing in the left hand one. And at any time thereafter it is only necessary to reverse this operation in order to change back from the red field to the black field of the ribbon. With the locking pin 76 engaged with the notch 79 in the driving shaft, however, it may happen that while writing on the back field, the ribbon winding on the left hand spool and off the right hand spool, said ribbon may unwind entirely from the right hand spool, thereby causing an automatic shift from the black field to the red field. If at this stage it is desired to continue writing in the black field, the knurled finger piece 83 is pulled outward to the left, until the forked member 80 acts on the switching member 69 to slide the latter leftward along the driving shaft 46 until the locking pin 76 engages with the notch 79. The parts will now be in the relation indicated in Fig. 8. A comparison of said figure with Fig. 6 will show that the actuating link 63 is in the same position in both, the draw spring 66 acting to pull the link 63 to its rearmost position when the switching member is drawn leftward out of contact with the lug 88 of the rotary arm 85. As long as the locking spring 76 is maintained in engagement with the notch 79, the to and fro sliding movement of the rock shaft 46 will fail to shift the switching member 69 far enough to contact with the lug 88, so that the link 63 is maintained in rearmost position and the type impressions will follow a course back and forth along the path *a* no matter how many times the longitudinal feed of the ribbon may be reversed.

When it is desired to restore the parts to normal position the slide rod 82 is pushed inward by means of the finger piece 83 until the forked member 80 causes the switching member 69 to slide back to first position with the locking pin 76 in engagement with the notch 77 after which any of the operations hitherto described may be performed.

In order not to complicate the description of the invention proper, the means for automatically reversing the longitudinal feed of the ribbon has not hitherto been described. The preferred means, as heretofore stated, is explained in detail in the patent to Felbel and Gabrielson No. 703,339, and it is thought sufficient at this time to describe the reversing mechanism briefly, reference being had to the said patent for a fuller description.

Referring now to Figs. 12, 13 and 14 of the drawings of the present application, 89 designates an elbow lever pivoted to the under side of the right-hand ribbon spool 36 and for the greater part of the time retained in the position indicated in Fig. 13 by folds of the ribbon 37. It will be noted from an inspection of the top plan view shown in Fig. 12 that the parts are so positioned that the ribbon is winding 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 89 serves to retain in non-working position a cam plate 90 slidably secured to the under side of the ribbon spool. When the ribbon has been completely unwound from the spool it releases the upright arm of the elbow lever 89, thereby permitting the cam plate 90 to slide vertically downward to the position indicated in Fig. 14, in which position the cam face 91 is adapted to engage an upright pin 92 secured at one end of a horizontal lever 93. The other end of the lever 93 is normally impelled rearwardly by a spring 94 so as to contact with and hold in rearmost position the upright arm 95 of a slide rod 96 which is constantly pressed forward by a coiled spring 97. The rear end of the slide rod is bent and terminates in a forwardly extending trip pin 98 which normally is opposite to, but out of engagement with, a worm 99 fixedly secured to the driving shaft 46. As the right-hand spool 36 continues to rotate after the cam plate 90 is slid down to the position indicated in Fig. 14, the cam face 91, acting upon the pin 92, cams the horizontal lever 93 against the pressure of the spring 94 to the position indicated in Fig. 12, thereby allowing the slide rod 96 to be moved forward by its spring 97 until the trip pin 98 engages with the worm 99. After this engagement takes place the driving shaft 46, as it is rotated during the operation of the machine, will be wormed along to the right until the right-hand driving pinion 45 meshes with its associate pinion 44 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 89 against the spool core, restoring said lever, and with it the cam plate 90, to the position indicated in Fig. 13. When the cam plate 90 is moved upward it releases the horizontal lever 93, permitting the latter to again act upon the slide rod 96 to push said slide rod rearwardly and restore the trip pin 98 to non-working position, the spring 94 being strong enough to overcome the spring 97. It is to be understood that the left-hand ribbon spool is provided with a similar train of mechanism which will operate in a similar manner when the said spool is emptied of the ribbon.

It will be noted that by my present invention, I provide means for throwing the ribbon vibrator any one of a plurality of predetermined, distinct distances so that a type will strike at any one of a plurality of predetermined, distinct points in the width of the ribbon. The path of the type impressions will be lengthwise of one portion of the ribbon until the longitudinal feed of the ribbon is reversed, whereupon, normally, the ribbon will shift widthwise and the path will change to one parallel with the first path and length-

wise of the ribbon along another portion of it. Means are also provided for preventing widthwise shift or change of path when the lengthwise feed of the ribbon is reversed, and when such means is operated the type impressions will be confined to a single path.

In the machine illustrated in the drawings, the relation between the platen and the ribbon vibrator is not affected by a change of case, but I desire to be understood that my invention is not limited to constructions wherein the relation between the platen and the ribbon vibrator remains unaltered when case is changed. Furthermore, while the drawings illustrate one construction of mechanism for automatically moving the ribbon to cover the printing point during printing operation and for thereafter moving said ribbon to uncover the printing point, it is to be understood that other means of accomplishing this result may be employed. Wherever in the claims it is stated that the vibrator or vibratory carrier is thrown to the printing point I desire to be understood as meaning that the vibrator is moved so as to cause the ribbon to cover the printing point on the platen.

Various other changes besides those noted may be effected in the details of construction and arrangements of parts all without departing from the gist of my invention.

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

1. In a visible writing machine, the combination of means for feeding a ribbon longitudinally, means for reversing the longitudinal feed of the ribbon, means including a ribbon vibrator operatively controlled by the ribbon-reversing means for shifting the ribbon widthwise, and means for rendering said ribbon shifting means inoperative when actuated.
2. In a visible writing machine, the combination of a ribbon normally removed from the printing point, means for feeding the ribbon longitudinally, means for reversing the longitudinal feed of the ribbon, means operatively controlled by the ribbon reversing means for shifting the ribbon widthwise, and means for rendering said widthwise shifting means inoperative when actuated.
3. In a visible writing machine, the combination of a ribbon, a ribbon winding mechanism, means for reversing the ribbon winding mechanism, means for holding the ribbon normally away from the printing point, means for moving the ribbon automatically to cover the printing point, means operated by the ribbon reversing means for altering the extent of said automatic movement, and means for rendering said altering means inoperative.
4. In a visible writing machine, the combination of a pair of ribbon spools, turning means therefor, means for reversing said turning means, a ribbon carrier arranged

normally away from the printing point, means for moving said carrier to and from the printing point, means operatively controlled by said ribbon-reversing means for altering the extent of movement of said carrier, and means for rendering said altering means inoperative when actuated.

5. In a visible writing machine, the combination of a pair of ribbon spools arranged one at either side of the printing point, winding means for said spool, means for reversing said winding means, a ribbon carrier arranged between the spools and normally away from the printing point, means for moving the carrier independently of the spools to and from the printing point, means operative by the said reversing means for altering the extent of movement of the carrier, and means for rendering said altering means inoperative.

6. In a visible writing machine, the combination of a pair of ribbon spools arranged one at either side of the printing point, winding means for said spools, means for reversing said winding means, a ribbon carrier arranged between the spools and normally away from the printing point, means for throwing the carrier upward one or another of a plurality of predetermined distances to cover the printing point during printing operation, means for changing the throw of said carrier automatically from one to another of said predetermined distances, and means for rendering said automatic changing means inoperative.

7. In a visible writing machine, the combination of a series of printing keys, a ribbon, a ribbon winding mechanism, means for reversing said ribbon winding mechanism, means operated by the printing keys for moving the ribbon to and from the printing point, means operatively controlled by said reversing means for altering the to and from movement of the ribbon, and means for rendering said altering means inoperative.

8. In a visible writing machine, the combination of a series of printing keys, a universal bar operated by said printing keys, a ribbon, a ribbon winding mechanism, means for reversing said ribbon winding mechanism, means actuated by said universal bar for moving the ribbon to and from the printing point, means connected with said ribbon winding mechanism and with said reversing means and operable by the latter for altering said to and from movement of the ribbon, and means for rendering said altering means inoperative.

9. In a visible writing machine, the combination of a ribbon carrier, means for moving said carrier to and from the printing point, a ribbon winding mechanism, means for reversing said ribbon winding mechanism, a switching member operable by said reversing means to alter the movement of said carrier moving means, and means for

rendering said switching member inoperative when actuated.

10. In a visible writing machine, the combination of a ribbon carrier, means for moving said carrier to and from the printing point, a driving shaft, a ribbon winding mechanism connected with said driving shaft, means connected with said driving shaft for reversing said ribbon winding mechanism, a switching member slidably mounted upon said driving shaft and operable by said reversing means to alter the movement of said carrier moving means, and means for changing the relation between said switching member and said driving shaft.

11. In a visible writing machine, the combination of a ribbon carrier, means for moving said carrier to and from the printing point, a driving shaft, a ribbon winding mechanism connected with said driving shaft, means connected with said driving shaft for reversing said ribbon winding mechanism, a switching member slidably mounted upon said driving shaft and operable by said reversing means to alter the movement of said carrier moving means, and hand controlled means operable exteriorly of the machine for altering the relation between said switching member and said driving shaft.

12. In a visible writing machine, the combination of a ribbon carrier, a lever adapted to move said carrier to and from the printing point, ribbon winding mechanism, means for reversing said ribbon winding mechanism, means for automatically altering the throw of said lever only when said reversing means is operated, and means for rendering said automatic means inoperative.

13. In a typewriting machine, the combination of a ribbon vibrator, a single lever for operating said vibrator, a single means operative upon said lever at one or another of a plurality of predetermined distances from its fulcrum, means for automatically causing said single means to operate on said lever at one or another of said predetermined distances, and means for rendering said automatic means inoperative.

14. In a typewriting machine, the combination of a ribbon vibrator, a single lever for operating said vibrator, a single link for actuating said lever, means for maintaining said link in a fixed relation with said lever, means for automatically altering said fixed relation, means for rendering said automatic means inoperative, and means for actuating said link.

15. In a typewriting machine, the combination of a ribbon vibrator, a single lever for operating the same, a key actuated universal bar, a single link connected with said universal bar and operative upon said lever to throw said vibrator one or another of a plurality of predetermined distances, means for automatically altering the predetermined

distance to which the vibrator is thrown, and means for rendering said automatic means inoperative.

16. In a typewriting machine, the combination of a ribbon carrier, a lever for operating the same, a link operable upon said lever at one or another of a plurality of predetermined points, means for actuating said link, means for maintaining said link in engagement with said operating lever at one or another of said predetermined points, means for automatically moving said link to cause it to engage said lever at another of said predetermined points, and means for rendering said automatic means inoperative.

17. In a typewriting machine, the combination of a ribbon vibrator, a slotted lever for operating the same, a link provided with a pin adapted to engage the slot in said lever, a draw spring adapted to maintain the link as far as possible from the fulcrum of the lever, means for automatically altering the relation between said link and said lever whereby they are caused to engage nearer the fulcrum of the latter, means for rendering said automatic means inoperative, and means for actuating said link.

18. In a typewriting machine, the combination of a ribbon vibrator, a slotted lever for operating the same, a link provided with a pin adapted to engage the slot in said lever, means for actuating said link, a draw spring adapted to maintain said link engaged with said lever as far as possible from the fulcrum of the latter, a driving shaft, means for automatically moving said driving shaft longitudinally to and fro, a link switching member slidable upon said driving shaft, means for maintaining said switching member in a fixed relation with said driving shaft, said switching member normally operating upon said link to shift the latter longitudinally of said lever when said driving shaft is shifted longitudinally, and means for rendering said switching member inoperative upon said link.

19. In a typewriting machine, the combination of a ribbon vibrator, a slotted lever for operating the same, a link provided with a pin adapted to engage the slot in said lever, means for actuating said link, a draw spring adapted to maintain said link engaged with said lever as far as possible from the fulcrum of the latter, a driving shaft, means for automatically moving said driving shaft longitudinally to and fro, a link switching member slidable upon said driving shaft, means for maintaining said switching member in a fixed relation with said driving shaft, said switching member being normally operable upon said link to shift the latter longitudinally of said lever when said driving shaft is shifted longitudinally, and hand operated means adapted to slide said switching member on said driving shaft to a predetermined inoperative position.

20. In a typewriting machine, the combination of printing instrumentalities, a ribbon, means for feeding said ribbon longitudinally, a ribbon vibrator, means for throwing said vibrator one or another of a plurality of predetermined distances so as to cause the types to follow one or another of a number of predetermined parallel paths longitudinally of said ribbon, means for automatically changing the throw of said vibrator directly from one to another of said predetermined distances, and means for rendering said automatic means inoperative.

21. In a typewriting machine, the combination of printing instrumentalities, a ribbon, means for feeding said ribbon longitudinally, a ribbon vibrator, an operating lever therefor, actuating means adapted to act on said lever in one or another of a plurality of predetermined points so as to cause the types to follow one or another of a plurality of straight, parallel and predetermined paths longitudinal of said ribbon, a shifting member adapted to shift said actuating means automatically from one to another of said predetermined points, and means for rendering said shifting member inoperative.

22. In a typewriting machine, the combination of printing instrumentalities, a ribbon, means for feeding said ribbon longitudinally, a ribbon vibrator, an operating lever therefor, actuating means adapted to co-act with said lever in one or another of a plurality of predetermined fixed relations and thereby to cause the printing types to follow one of a plurality of predetermined distinct paths, means for automatically changing from one to another of the predetermined fixed relations between the operating lever and its actuating means, and means for rendering said automatic means inoperative.

23. In a typewriting machine, the combination of a ribbon vibrator, an operating lever, an actuating link, means for causing said link to actuate said lever, a link shifting means, and means interposed between said last named means and said link for increasing the shifting movement caused by said link shifting means.

24. In a typewriting machine, the combination of a ribbon vibrator, an operating lever, an actuating link, means for causing said link to actuate said lever, a link shifting means, and a rotary arm connected with said link and operable by said shifting means, and adapted to increase the shifting movement.

25. In a typewriting machine, the combination of key operated types, a pair of ribbon spools, means for driving said spools alternately, a ribbon guide between the spools, means directing the guide so that the types will coöperate with the ribbon always in one of two paths longitudinal of said ribbon when one ribbon spool is being driven and always in the other of said two paths when the other

spool is being driven, and means for rendering said last recited means inoperative when actuated.

26. In a typewriting machine, the combination of means for feeding a ribbon lengthwise, means for reversing the lengthwise feed of the ribbon, ribbon throwing means, means for changing the throw of the ribbon when the lengthwise feed of the ribbon is reversed, and means for rendering said last recited means inoperative when actuated.

27. In a typewriting machine, the combination of a ribbon guide, a pair of ribbon spools, driving mechanism shiftable to drive said spools alternately, means actuated by said driving mechanism, when it is shifted, to operate on the guide to cause the ribbon to be used alternately in one or another of two parallel paths only, said last named means being inoperative on the ribbon spools, and means for rendering said last named means inoperative on the guide.

28. In a typewriting machine, the combination of a ribbon carrier, means for throwing said ribbon carrier variably, longitudinal ribbon feeding mechanism, ribbon re-

versing mechanism, connections between the throwing means and the reversing mechanism, and means for disconnecting said connection to render the reversing mechanism inoperative on the throwing means.

29. In a typewriting machine, the combination of a ribbon guide, devices for vibrating said guide to bring the ribbon over the printing point, means for varying the vibration of said guide to change the portion of the ribbon brought over the printing point, means for reversing the direction of the ribbon feed, and a connection between the ribbon feed reversing means and the means for varying the vibration of the guide, said connection being separable so as to render said means inoperative one on the other.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 14th day of March, A. D. 1905:

MORRIS V. POOL.

Witnesses:

E. M. WELLS,
M. F. HANNWEBER.