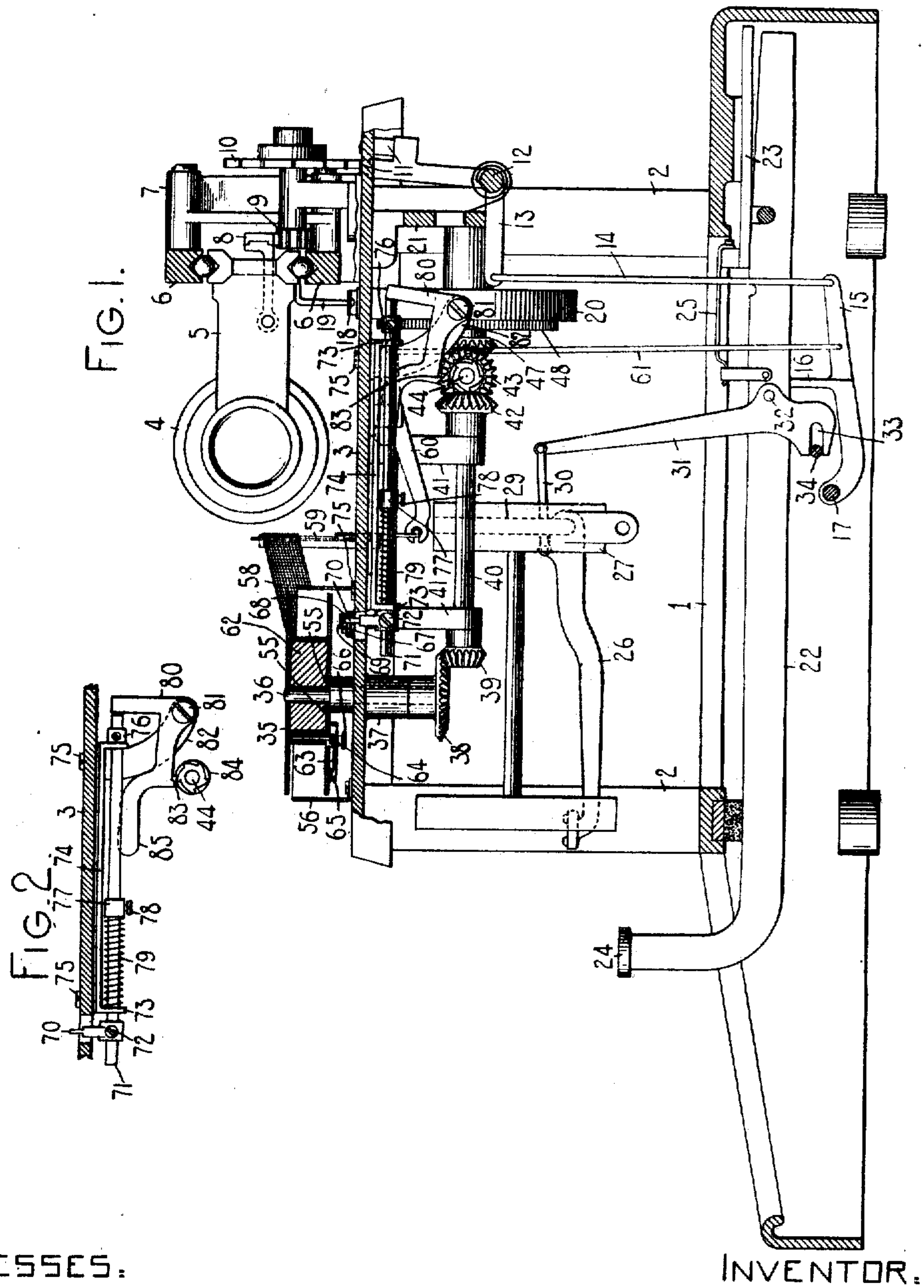


908,703.

G. A. SEIB.
TYPE WRITING MACHINE.
APPLICATION FILED MAY 12, 1906.

Patented Jan. 5, 1909.
3 SHEETS—SHEET 1.



WITNESSES:

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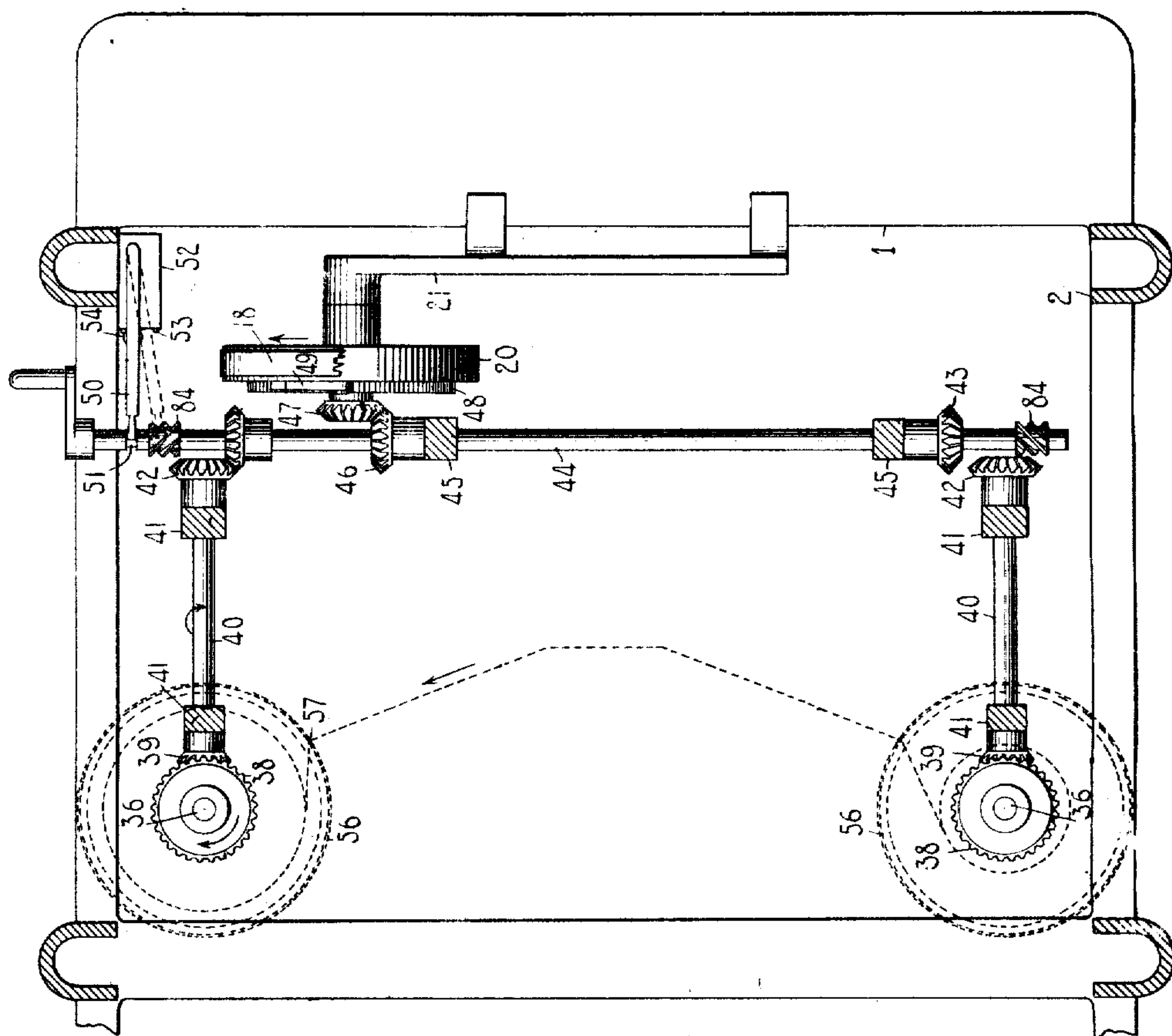


FIG. 3.

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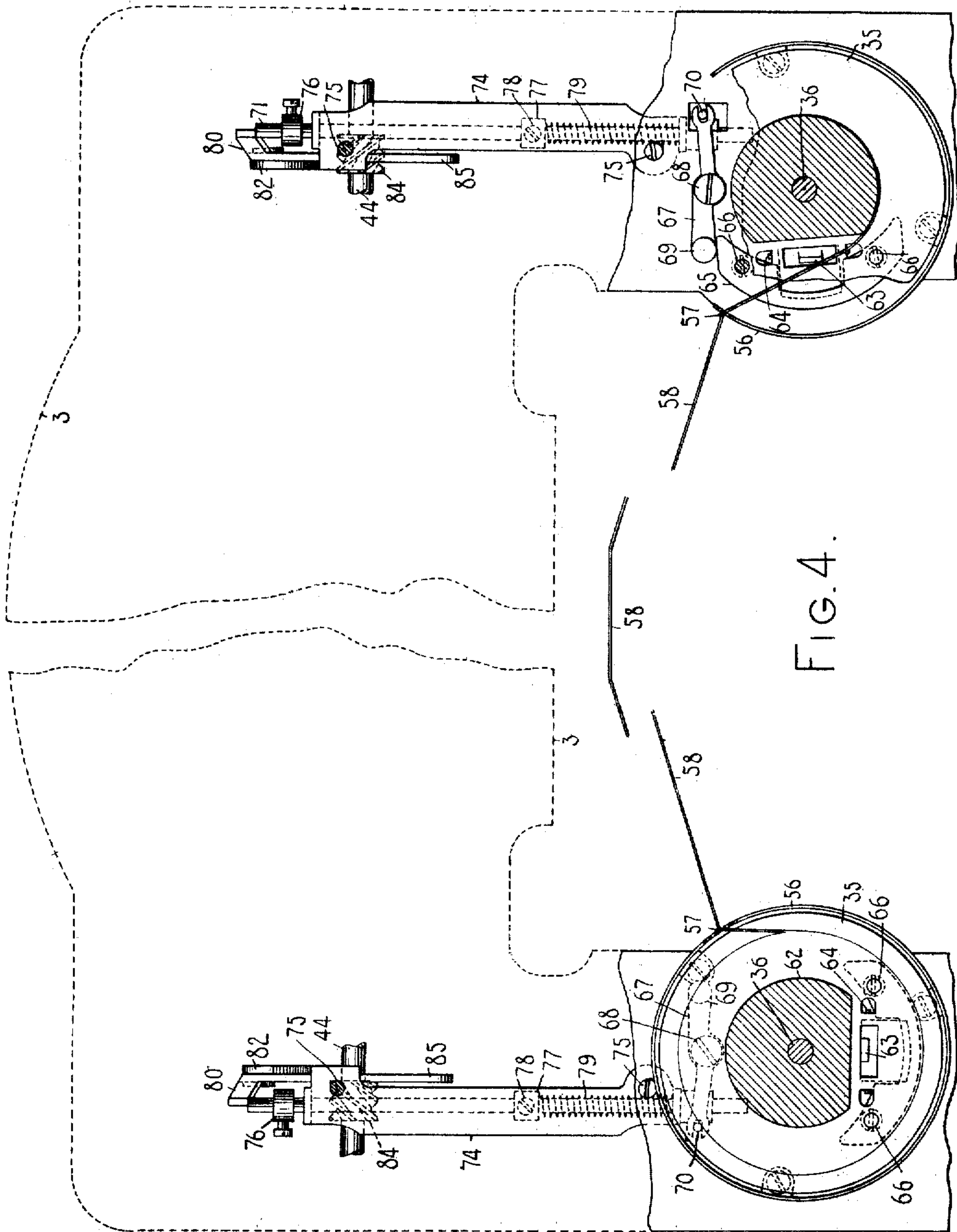
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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

TYPE-WRITING MACHINE.

No. 908,703.

Specification of Letters Patent.

Patented Jan. 5, 1909.

Application filed May 12, 1905. Serial No. 260,091.

To all whom it may concern:

Be it known that I, GEORGE A. SEIB, citizen of the United States, and resident of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and it has for its principal object to provide an improved device for reversing the feed of the ink ribbon.

My invention consists in certain features of construction and combinations and arrangements of parts which will be fully set forth herein and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a typewriting machine embodying my invention, parts being shown in section and parts broken away. Fig. 2 is a view similar to Fig. 1 of a portion of the mechanism shown in said Fig. 1, the parts being shown in a different position. Fig. 3 is a top plan view on a section taken just beneath the top plate of the machine, some of the parts being omitted. Fig. 4 is a plan view of the upper part of which is on a horizontal section just beneath the top plate and the lower part of which is on a horizontal section just beneath the upper flanges of the ribbon spools, some of the parts being shown in this figure which are omitted in Fig. 3.

I have shown my invention applied to a Monarch front-strike typewriter. The main frame of this machine comprises a base portion 1 from which rise posts 2 that support a top plate 3. A platen 4 is mounted on a carriage 5 which is supported through ball bearings by rails 6 mounted on posts 7 which rise from the top plate 3. In Fig. 1 that post 7 which is nearest the observer is removed in order to disclose the carriage feed mechanism, said feed mechanism comprising a rack bar 8 pivotally mounted on the carriage and meshing with a pinion 9 fixed on the forward end of a shaft, the rear end of which carries an escapement wheel 10 which is controlled by feed dogs 11 which are mounted on a dog rocker 12, an arm 13 of which is connected by a link 14 with an arm 15 which is connected with a universal bar 16, which is pivoted at 17 to the side plates of the base portion 1 of the main frame. The carriage

is drawn across the machine by a strap 18 which is connected at one end to an arm 19 which projects from the carriage 5 and at the other end to a spring drum 20 which is mounted on a bracket 21 which is secured to the under side of the top plate 3 and which also carries the dog rocker 12. The universal bar 16 lies beneath a series of key levers 22, which at their rear ends are fulcrumed on a fulcrum plate 23 and at their forward ends are provided with finger keys 24. Said key levers are returned to normal position by restoring springs 25. A series of front-strike type bars 26 are pivotally mounted in any suitable manner on a type bar segment 27 which may be mounted in the machine in any suitable manner. As here shown, the type bars are mounted in radial slots and they are pivoted on a pivot wire 29 which lies in a slot in the upper face of the segment. Said type bars are connected by links 30 with sub-levers 31 which are pivoted at 32 to the key levers 22. Said sublevers extend below said key levers and said depending portions are formed with slots 33 which embrace a stationary rod 34. The construction is such that when any key 24 is struck, the corresponding type bar is thrown to the printing point on the front face of the platen and the carriage is fed a letter space distance by the spring drum 20 controlled by the escapement dogs 11.

Two ribbon spools 35 are mounted on the upper ends of vertical shafts or spindles 36 which project upward through the top plate 3, being journaled in bosses 37 depending from said top plate. Each of the spindles 36 has on its lower end a beveled gear 38 which meshes with a beveled pinion 39 mounted on the forward end of a horizontal shaft 40 which is journaled in brackets 41 depending from the top plate. Each of the shafts 40 has mounted on its rear end a beveled pinion 42 that is adapted to mesh with a beveled pinion 43 mounted on a driving shaft 44. The shaft 44 is rotatably and slidably journaled in brackets 45 depending from the top plate 3. The construction is such that the shaft 44 may be geared with either of the shafts 40 by sliding said shaft 44 a short distance to the right or left. The shaft 44 is rotated to drive one or another of the ribbon spools by a beveled pinion 46 splined on said shaft and meshing with a beveled pinion 47 which is journaled co-ax-

ially with the spring drum 20. A ratchet wheel 48 rigid with the pinion 47 is engaged by a pawl 49 mounted on said spring drum, so that said ratchet wheel and pinion are turned with the spring drum when the carriage is moving toward the left, but not when the carriage is moving toward the right. The pinion 46 is prevented from moving endwise with the shaft 44 in one direction by the pinion 47 and in the other direction by one of the brackets 45 which engages the hub of said pinion. The shaft 44 is yieldingly held in position for one or the other of the pinions 43 to engage one of the pinions 42 by an arm 50, the end of which lies in an annular groove 51 formed in the shaft 44. The other end of the arm 50 is pivoted in a fixed bracket 52 in which is mounted a spring-pressed plunger 53 having two V-shaped notches in the end thereof which engage a roller 54 mounted on the arm 50. This device is not shown in all its details as it is of ordinary and well known construction.

The ribbon spools 35 are held a little above the top plate by enlargements of the spindles 36, which enlargements are formed with upwardly projecting lugs or pins 55 (Fig. 1) which project into openings in the lower part of the ribbon spools and which serve as keys to cause said spools and the spindles to turn together. The ribbon spools are surrounded by annular housings 56 which are formed at 57 with guide slots for the ink ribbon 58 which is led from said guide slots to a ribbon vibrator 59 which is operated by a lever 60 pivoted beneath the top plate and connected by a link 61 with the arm 15 of the universal bar. The construction thus far described is, or may be, substantially that ordinarily used in the Monarch typewriter. Each of the ribbon spools has a core 62 which is flattened on one side and on which the ink ribbon 58 is wound. An elbow lever 63 is pivoted at 64 on ears struck down from the lower flange of the ribbon spool, and said elbow lever has an arm which extends upward through a suitable hole in said flange opposite the flattened portion of the core of the spool. The elbow lever 63 has a substantially horizontally disposed arm which lies beneath a cam plate 65 which is loosely mounted on headed pins 66 projecting downward from the flange. When the ribbon is wound on the spool the upper arm of the elbow lever 63 is pressed by the coils of ribbon toward the core of the spool and the horizontally extending arm of said elbow lever presses the cam plate 65 up against the lower face of the lower flange; but when the last turn of the ribbon is unwound from this part of the spool, as shown in the right-hand spool in Fig. 4, the arm of the elbow lever 63 is released and the plate 65 drops until it is arrested by the heads of the pins 66. The

mechanism just described is or may be substantially the same as that shown in the patent to Lenzel and Gabrielson, No. 703,339, dated June 24th, 1902.

A horizontal lever 67 is pivoted beneath each of the ribbon spools on a shouldered and headed screw 68 and said lever has a pin 69 projecting upward from one end thereof. This lever normally stands in such position that when the plate 65 is held up against the flange of the ribbon spool, said plate in the rotation of said spool passes over the top of the pin; but when the elbow lever 63 is released and the plate 65 drops to its lower position, the cam end of said plate, by reason of the further rotation of the spool, will engage the pin 69 and cam said pin away from the center of the ribbon spool, thus rocking the lever 67. The opposite end of said lever is forked as shown in Fig. 4 to embrace a pin 70 which projects upward through a suitable slot in the top plate 3 from a horizontal sliding rod 71. The pin 70 consists of the reduced upper end of an arm or bracket, the hub of which is adjustably fixed on the rod 71 by a set screw 72. The rod 71 extends toward the back of the machine and is slidably mounted in ears 73 bent down from a support or hanger 74 which is fastened to the under side of the top plate 3 by screws 75. The sliding motion of the rod 71 is adjustably limited in one direction by the hub of the pin 70 engaging one of the ears 73 and in the other direction by a collar 76 secured by a set screw on said rod near the rear end thereof and adapted to engage the other of said ears 73. Another collar 77 is adjustably fixed on the rod 71 between the ears 73 by means of a set screw 78, and a spiral spring 79 coiled about the rod 71 and compressed between the collar 77 and the forward ear 73, normally presses the arm 71 toward the back of the machine, thus normally holding the pin 69 on the lever 67 in its position nearest the center of the ribbon spool. The pin 70 projecting through the slot in the top plate prevents the sliding rod from turning in its bearings; or, if preferred, any other suitable means may be provided for this purpose. An angled trip lever 80 is pivoted on a shouldered and headed screw 81 which is threaded into a bracket 82 bent down from the hanger 74 at the rear end thereof. The lever 80 has an upwardly extending arm that stands behind the rear end of the rod 71 and a forwardly extending weighted arm that extends over the driving shaft 44. Said weighted arm controls a tooth 83 which is adapted to engage a worm 84 mounted on the driving shaft 44. In the present instance said tooth or pin is formed on the under side of said arm. Said tooth and worm constitute cooperating tripping members for causing the shaft 44 to shift itself by its own rotation.

In the normal position of the parts shown

in Fig. 1 the rod 71 is pressed to its rear position by the spring 79 and said rod thus presses the upwardly extending arm of the lever 80 toward the rear of the machine and holds the forwardly extending weighted arm of said lever in an upper position in which the tooth 83 is out of engagement with the worm 84. But when the ribbon has been unwound to such an extent as to release the elbow lever 63 and when the cam 65 moves the rod 71 to its forward position, the lever 80 drops by gravity to the position shown in Fig. 2 with the tooth 83 in engagement with the worm 84. Upon the continued rotation of the driving shaft, the worm 84, engaging the tooth 83, draws the shaft 44 toward that side of the machine on which the exhausted ribbon spool is situated until the roller 54 has been moved out of one of the notches in the plunger 53 and has started to move into the other, at which point the motion of the shaft is completed by the spring plunger 53 acting on the roller 54 and lever 50. There are, of course, two of the worms 84, one of which has a right-hand and the other a left-hand thread, and each of the ribbon spools is equipped with a reversing mechanism such as has been described. The lever 80 has its horizontal arm prolonged beyond the shaft 44, as shown at 85 in Fig. 2. The extension 85 is so formed as to engage the under side of the top plate and thus prevent any overthrow of the lever 80 when the rod 71 is thrown back by the spring 79; and said extension also adds by its weight to the tendency of the lever to drop when the rod 71 is withdrawn. Each of the teeth 83 is bent or beveled off, as indicated in Fig. 2, at an angle corresponding to the pitch of the worm 84. A light spring may be used to assist gravity in dropping the trip lever into engagement with the worm, if preferred; and in case said lever be mounted horizontally instead of vertically, as in the present instance, such a spring or its equivalent would necessarily be employed. The right-hand tooth 83 and worm 84, when they are brought into operation, draw the shaft 44 toward the right and the left-hand tooth 83 and worm 84 are never called upon to slide the shaft, except toward the left.

As will be seen by reference to Figs. 1, 2 and 4, the brackets 82 are curved downward and toward the rear of the machine and the levers 80 lie for some distance in front of their pivots against the faces of said brackets, the right-hand lever 80 lying against the right-hand face of its bracket 82, and the left-hand lever 80 lying against the left-hand face of its bracket 82. The construction is such that each of the brackets affords a firm support for the lever to overcome the resistance of the shaft 44 in a right-hand direction in one case and in a left-hand direction in the other.

Various changes may be made in the details of construction and arrangement without departing from my invention.

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

1. In a typewriting machine, the combination of a pair of ribbon spools; a rotary driving shaft common to both spools and having two worms thereon; two trips adapted to fall by gravity into engagement with said worms to shift said shaft endwise to connect it with one or another of said spools; two spring-pressed rods for normally holding said trips away from said worms; and devices on said ribbon spools brought into operation when the ribbon is nearly exhausted from a spool to move one of the spring-pressed rods to allow its trip to drop into engagement with its worm.

2. In a typewriting machine, the combination of a pair of ribbon spools; a rotary driving shaft adapted to be shifted endwise to gear it to one or the other of said spools; a shifting worm on said driving shaft; a trip adapted to fall by gravity into engagement with said worm; a spring-pressed rod for normally holding said trip in inoperative position; and means on said ribbon spool brought into operation when the ribbon is nearly exhausted from the spool, for positively moving said rod in the direction of its length against the tension of its spring to allow said trip to drop into engagement with said worm.

3. In a typewriting machine, the combination of two ribbon spools mounted to turn on vertical axes; a driving shaft adapted to be shifted endwise to gear it to one or the other of said spools; two worms on said driving shaft; trips adapted to fall by gravity into engagement with said worms; spring-pressed slidable rods for normally holding said trips away from said worms; levers pivoted under the ribbon spools and positively connected with said rods; and cams on said ribbon spools, normally held in inoperative position by the ribbon but each adapted, when the ribbon is nearly exhausted from a spool, to drop into position to operate one of said levers to move its sliding rod against the tension of its spring to allow its trip to drop into engagement with its worm.

4. In a typewriting machine, the combination of a pair of ribbon spools; a self shifting endwise movable driver common to both spools and provided with a worm; a tripping lever normally tending to engage said worm; means normally holding said tripping lever out of operative position; and means rotating with one of said spools for moving said holding means to a position permitting said tripping lever to move into engagement with said worm.

5. In a typewriting machine, the combina-

tion with a pair of ribbon spools, of a self shifting endwise movable driver common to both spools and provided with a worm; a tripping lever normally tending to engage said worm; a device on the framework between the spool and the tripping lever normally holding said tripping lever out of operative position; and means operable through the longitudinal movement of the ribbon for forcing said holding device to release said tripping lever.

6. In a typewriting machine, the combination with a pair of ribbon spools, of a self shifting endwise movable driver common to both spools and provided with a worm; a tripping lever normally tending to engage said worm; a device normally holding said tripping lever out of active position; a device mounted to rotate with one of the spools and to be held in inoperative position by the coils of ribbon; and means called into action by said spool device when released by the ribbon for forcing said lever holding device to release said lever.

7. In a typewriting machine, the combination with a pair of ribbon spools, of a driving shaft common to both spools; a pair of worms upon said shaft; a pair of tripping levers tending to engage said worms; devices normally holding said tripping levers out of engagement with said worms, said holding devices being arranged on the framework and normally disconnected from the spools; and means operating automatically through the longitudinal movements of the ribbon for forcing said holding devices to release said tripping levers one at a time, whereby said shaft is caused to drive the spools alternately.

8. In a typewriting machine, the combination with a pair of ribbon spools, of a driving shaft common to both spools; a pair of worms on said shaft; a pair of tripping levers tending to engage said worms; devices normally holding said tripping levers out of engagement with said worms; a cam arranged at each spool; and means called into action through the longitudinal movements of the ribbon for enabling said cams to force said holding devices to release said levers.

9. In a typewriting machine, the combination with a pair of ribbon spools; a driving shaft common to both spools; a pair of worms on said shaft; a pair of tripping levers tending to engage said worms; a sliding rod extending from each spool to its tripping lever and holding said lever away from its worm; and means called into operation by the longitudinal movement of the ribbon for forcing said rod to release said lever.

10. In a typewriting machine, the combination of two ribbon spools; a rotary driving shaft having two gears and two worms mounted thereon and adapted to be moved

endwise to gear it with one or the other of said spools; tripping devices tending to fall by gravity into engagement with said worms to cause said driving shaft to shift itself to reverse the direction of feed of the ribbon; spring pressed devices normally holding said gravity tripping devices out of operation; and means controlled by the ribbon for forcing said spring-pressed devices to release said gravity tripping devices.

11. In a typewriting machine, the combination of two ribbon spools; two horizontal shafts extending rearwardly from said ribbon spools; a rotary driving shaft shiftable endwise to gear it with one or the other of said rearwardly extending shafts; two worms on said driving shaft; two teeth pivotally supported from the framework and tending to fall by gravity into engagement with the worms on said shaft; two rods each extending from a ribbon spool to one of said gravity operating teeth and each spring-pressed in the direction of its length to hold its gravity operating tooth out of operation; and means controlled by the ribbon for forcing one or the other of said spring-pressed rods to release said gravity operating tooth.

12. In a typewriting machine, the combination of two ribbon spools; two shafts controlling the rotation of said ribbon spools; a rotary and endwise movable self shifting driving shaft adapted to be geared to one or the other of said shafts; a worm mounted on said driving shaft; an angled lever pivoted on the framework and having a horizontally extending arm adapted to move into engagement with said worm and an upright arm; a spring-pressed sliding rod normally engaging said upright arm to hold said lever out of engagement with said worm; a cam on one of the ribbon spools, said cam being controlled by the ribbon; and means whereby when the ribbon is nearly exhausted from the spool said cam slides said rod against the tension of its spring and releases said angled lever.

13. In a typewriting machine, the combination of a ribbon spool; a cam mounted on said ribbon spool and normally held in inoperative position by the ribbon; a lever pivoted on the framework and adapted to be engaged by said cam when the latter is released by the ribbon; a sliding rod positively actuated by said lever; a tripping lever tending to move to operative position but normally held in inoperative position by said rod; and a worm cooperating with said tripping lever, when said tripping lever moves to operative position, for reversing the feed of the ribbon.

14. In a typewriting machine and in an automatic ribbon reversing mechanism, the combination of a pair of ribbon spools; means for driving said spools, a pair of worms; a pair of tripping levers pivoted on

the frame-work of the machine and adapted alternatively to engage said worms; and means controlled by the ribbon on the spools for controlling the operation of said tripping levers.

15. In a typewriting machine and in an automatic ribbon reversing mechanism, the combination of a pair of ribbon spools; means for rotating the same; a pair of worms; a pair of gravity operating pins or teeth adapted alternatively to engage said worms; devices between said teeth and said ribbon spools; and ribbon controlled means on said spools for controlling said intermediate devices whereby when the ribbon runs out at either end one of said pins drops by gravity to engage the worm and effect reversal of the ribbon.

16. In a typewriting machine and in an automatic ribbon reversing mechanism, the combination of a pair of spools; means for turning said spools; a pair of worms; a pair of lever-controlled pins or teeth for engaging said worms; an actuating device on each ribbon spool; a lever at each ribbon spool to

be acted upon by said actuating device; and a spring-pressed rod at each side of the ribbon mechanism between said last-mentioned lever and the lever controlling the pin which engages the worm.

17. In a typewriting machine, the combination of two ribbon spools for an ink ribbon, a driving shaft for driving said spools alternatively, and means for shifting said shaft lengthwise to gear it to one or the other of said spools, said shifting means comprising two worms mounted on said shaft, means for engaging said worms to cause the shaft to be shifted, and two endwise movable rods mounted on the frame-work of the machine and controlled by the ribbon and each controlling a separate tooth adapted to engage one of said worms.

Signed at Syracuse, in the county of Onondaga and State of New York, this 10th day of May A. D. 1905.

GEORGE A. SEIB.

Witnesses:

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JOHN S. MITCHELL.