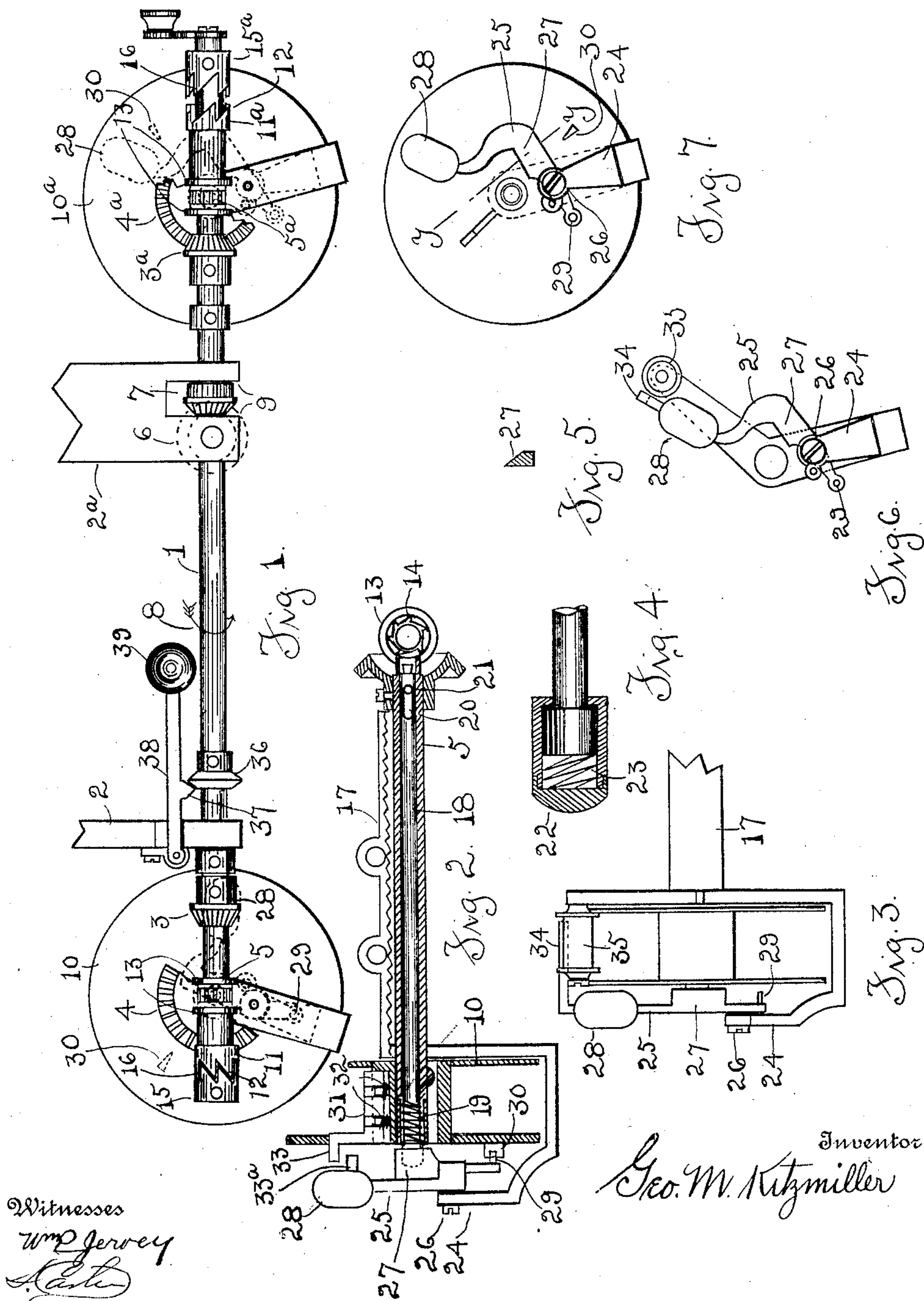


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 AUTOMATIC RIBBON REVERSING MECHANISM FOR TYPE WRITING MACHINES.
 APPLICATION FILED JAN. 12, 1910.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC RIBBON-REVERSING MECHANISM FOR TYPE-WRITING MACHINES.

959,945.

Specification of Letters Patent.

Patented May 31, 1910.

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To all-whom it may concern:

Be it known that I, GEORGE M. KITZMILLER, a citizen of the United States, and a resident of Norfolk, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Automatic Ribbon-Reversing Mechanism for Type-Writing Machines, of which the following is a specification.

My invention relates to automatic ribbon-reversing mechanism for type-writing machines.

In the present instance I have applied my invention to a type-writer of the well known Remington class, though it is obvious that my invention may be applied to other types of writing machine by slight changes in details of construction, and rearrangement of parts without departing from the spirit of my invention.

The object of my invention is to produce a simple and positive automatic reverse of the direction of the ribbon travel when the ribbon has been unwound from one of the spools. In the accompanying drawings, Figure 1 is a rear elevation of a typewriting machine with my invention applied, all parts not necessary to illustrate the same, having been removed. Fig. 2 is a sectional view of the ribbon-spool, operating lever in normal position, spool-shaft, plunger, bevel-gear and shifter. Fig. 3 is a side view of the ribbon-spool and part of the bracket, showing modified form of operating lever and ribbon-roller. Fig. 4 is an exaggerated view of the plunger head, spring and plunger. Fig. 5 is a sectional view of the operating lever taken at $y-y$, Fig. 7. Fig. 6 is a front view of the operating lever and ribbon roller support. Fig. 7 is a front view of a ribbon-spool with operating lever in normal position.

Similar reference characters refer to similar parts.

Fig. 1 is an embodiment of one form of my invention, consisting of an endwise movable gear-driven power-shaft 1, movably supported in the bearing posts or hangers 2, and 2^a, and is provided with bevel-gears 3, and 3^a, near its ends, which mesh with the spool-shaft bevel-gears 4, and 4^a, (secured to the spool shafts 5, and 5^a) according to the direction of the ribbon travel. The spool-shaft gears 4, and 4^a, are belled or concaved as shown in Fig. 2 for the purpose to be hereafter explained.

A rotary motion is imparted to the power-shaft 1, by the gears 6, and 7, which rotate the shaft 1, in the direction indicated by the arrow 8. The gear 7, is mounted in a longitudinal groove (not shown) on the shaft 1, so as to permit the shaft 1, to be shifted endwise, while the gear 7, is held from such endwise movement by the fork 9, allowing a free rotation by the action of the spring drum gear 6. An intermittent feed is transmitted to the ribbon spools 10, and 10^a, through the usual mechanism common in writing machines, accordingly as the gears 4, and 3, or 4^a, and 3^a, are meshed.

Loosely mounted on the shaft 1, opposite the gears 4, and 4^a, are shifters 11, and 11^a, which are provided with teeth 12, and are held from endwise movement by the end of the spool shaft 5, (Fig. 2) contacting with the flanges 13. The shifters 11, and 11^a, are also provided with teeth 14, (Fig. 2) for the purpose to be hereafter explained. Secured to and movable with the shaft 1, are the shifters 15, and 15^a, whose teeth 16, are cut to match those of the associate shifter.

The spool shafts 5, and 5^a, which are mounted in brackets 17, (Fig. 2) are provided with plungers 18, held in normal position by the spring 19, and the pin 21, in the slot 20. The plungers 18, are provided with a head 22, and spring 23, (Fig. 4) for the purpose to be hereafter explained. Secured to the bracket 17, is a lever support 24, in which is mounted a lever 25, pivoted at 26. The lever 25, is provided at 27, with a wedge-shaped projection, (Fig. 5) adapted when the lever is moved into operative position, to strike the plunger head 22, and force the head against the spring 23, (Fig. 4), which is of suitable tension, and cause the plunger 18, to protrude from the end of the shaft 5, into engagement with the teeth 14, of the shifter 11, thereby halting its rotation as will be more fully explained in the operation of the device. The lever 25, is provided with a weight 28, which will also be more fully explained later. The lever 25, extends below its point of pivot, and is provided with a pin 29, for engagement in its return movement after operation, with the lug or block 30. The ribbon-spools 10, and 10^a, are provided with latches 31, held in non-effective position by the ribbon-folds, and are moved into effective position by the springs 32. When released by the ribbon, the point 33, of the latch 32, operates to

force the lever 25, past its center of support, as will be referred to later in the description of the operation of the device. I may prefer to use the form of operating lever shown in Figs. 3 and 6, wherein the lever 25, is provided with an arm 34, bent so as to extend over the spool into the path of the ribbon travel, in which event the ribbon would be carried in the anti-friction roller 35. The ribbon at the desired distance from the ends would be provided with a suitable obstruction which would strike the arm 34, and force the lever past its center of support and into effective position.

Mounted on the shaft 1, is a wedge-shaped collar 36, which co-acts with the wedge-shaped projection 37, on the lever 38, mounted in the bracket 2. The lever 38, is provided with a suitable ball or weight 39, although I may use a spring to give tension to the lever 38, in place of the weight. The action of the lever will be further explained later.

Having given a general description of a construction which shows one form of embodiment of my invention, I will proceed to describe the operation thereof.

Figure 1 shows the reverse as just about to be effected. It will be seen that the ribbon is winding on the spool 10^a, and has been unwound from the spool 10, which has released the latch 31. In this operation the point 33, engages the lug 33^a, and as the spool 10^a, continues to wind the ribbon, the rotation of the spool 10, forces the weight 28, past the center of its support 26, when it falls by gravity to the position shown on spool 10. It will be understood that there will always be left on the unwinding spool a sufficient amount of ribbon to allow the spool to continue to unwind until the latch 31, has performed its function. In the fall of the weight 28, the wedge 27, forces the head 22 (Fig. 4) against one end of the spring 23, and the other end of the spring 23, against the plunger 18, forcing the plunger against the spring 19, which is of less tension than the spring 23, causing the end of the plunger 18, to engage a tooth 14, of the shifter 11, thereby halting its rotation. The gears 4, and 4^a, are concaved so as to allow the shifters 11, and 11^a, to freely rotate. Endwise movement of the shifters 11, and 11^a, is prevented by the flanges 13, between which the spool-shafts 5, and 5^a, rotate, as before explained. The shifter 15, is in mesh with the shifter 11, and when the rotation of the shifter 11, is halted, and the shaft 1, continues to rotate, the shifter 15, backs out of mesh with the shifter 11, thereby disengaging the gears 3^a, and 4^a, and the gears 3, and 4, come into mesh. Just as the teeth of the shifters 11, and 15, pass out of engagement, the point 37 of the lever 38, raises over the wedge 36, and the weight

39, causes the shaft 1, to complete its endwise movement and maintains the shifted position of the shaft 1. The gears 3, and 4, being meshed, the rotation of the spool 10, is reversed, and as the block or lug 30, moves around, it strikes the pin 29, of the lever 25, which being on a different center from that of the ribbon-spool, returns the lever 25, to normal position, and the weight 28, returning, passes the center of its support, the pin 29, passes out of the path traveled by the lug 30, and permits the spool to revolve unobstructed. After the shaft 1, has been shifted, it will be seen that the tension is released from the shifter 11, when the spring 19, in the shaft 5, draws the plunger 18, back to its normal position.

Instead of using the latch 31, I may desire to use an obstruction placed on the ribbon near its ends, in which event I provide an anti-friction roller mounted as in Figs. 3 and 6, wherein the lever 25, is provided with an arm 34, extending over and lying next the roller 35, in the path traveled by the ribbon. In the above explained operation, therefore, it will be seen that the obstruction would strike the arm 34, and force the weight 28, into effective position.

It is to be understood that there are various changes in details of construction and rearrangement of parts which I may make without departing from the spirit of my invention.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a type-writing machine and in a ribbon-reversing mechanism, the combination with a power-shaft carrying gears and rotatable shifting devices, of spool-shafts carrying gears and spools, and mechanism controlled by the ribbon to be projected into engagement with one of said devices to arrest the movement thereof.

2. In a type-writing machine and in a ribbon-reversing mechanism, the combination with a power-shaft carrying gears and rotatable shifter-teeth, of spool-shafts carrying gears and spools, ribbon-spools, and means controlled by the ribbon to be projected into engagement with one set of shifter-teeth to arrest the movement thereof.

3. In a type-writing machine and in a ribbon-reversing mechanism, the combination of a power-shaft carrying gears and a plurality of sets of rotatable shifters, one set of shifters positioned near the spool-shaft gears, spool-shafts carrying gears and spools, and means controlled by the ribbon to be projected into engagement with one of said shifters to arrest the movement thereof.

4. In a type-writing machine and in a ribbon-reversing mechanism, the combination of a power-shaft carrying gears, a plurality of sets of shifters mounted near the

ends thereof, one set of shifters secured to the power-shaft and one set mounted loosely on the power-shaft, spool-shafts carrying gears and spools, and mechanism controlled by the ribbon to be projected into engagement with the loosely mounted shifters to arrest the movement thereof.

5. In a type-writing machine and in a ribbon-reversing mechanism, the combination of a power-shaft carrying gears and a plurality of sets of rotatable shifters provided with teeth, spool-shafts carrying concaved gears, and means controlled by the ribbon to be projected into engagement with one set of teeth for halting the rotation thereof.

6. In a type-writing machine and in a ribbon-reversing mechanism, the combination of a power-shaft, a shifter secured to the said shaft near its end, a loosely mounted shifter provided with spur teeth and flanges, a spool-shaft whose free end rotates between said flanges, and means controlled by the ribbon for engaging said spur teeth to halt the rotation thereof.

7. In a type-writing machine and in a ribbon-reversing mechanism, the combination of a power-shaft carrying gears, a shifter secured to the said shaft near its end, a shifter provided with spur teeth and flanges, the last named shifter mounted loosely on said shaft, and prevented from endwise movement by the spool-shaft, a spool-shaft carrying a gear provided with a concave body, a plunger in the spool-shaft, and means controlled by the ribbon for reciprocating said plunger into and out of engagement with said spur teeth.

8. In a type-writing machine and in a ribbon-reversing mechanism, the combination of a power-shaft carrying gears and a plurality of sets of rotatable shifters, one set of shifters held from endwise movement by the spool-shaft, a spool-shaft carrying gears and spools, a plunger adapted to arrest the movement of the last-named shifters, and a gravity device whose path of movement is across the end of the spool-shaft, actuated by the ribbon for causing a suspension of rotation of one of said shifters.

9. In a type-writing machine and in a ribbon-reversing mechanism, the combination with a power-shaft carrying gears, of rotatable shifters held from endwise movement by the spool-shaft, a spool-shaft carrying gears, spools and a plunger, a lever provided with a weight at one of its free ends, and adapted to move said plunger into effective position, means for actuating said lever, and means on the ribbon-spool controlled by

the power shaft, for returning said lever to normal position.

10. In a type-writing machine and in a ribbon reversing mechanism, the combination with an endwise-movable power-shaft carrying gears and rotatable shifting devices, of spool-shafts carrying gears and spools, a plunger, a lever for causing said plunger to be projected into engagement with one of said shifters to arrest the movement thereof, and means controlled by the ribbon and power-shaft for moving the said lever into and out of effective position.

11. In a ribbon-reversing mechanism, the combination with ribbon-spools, of a lever, whose path of movement is across the center of the spool-shaft, means controlled by the ribbon for causing said lever to become effective, and means on the ribbon-spool for returning said lever to normal position.

12. In a ribbon-reversing mechanism, the combination with a ribbon-spool, of a lever mounted in a stationary support, a spool-shaft provided with a plunger, ribbon-controlled means for moving said lever and plunger into effective position, and means on the ribbon-spool for returning said lever to normal position.

13. In a ribbon-reversing mechanism, the combination with a ribbon-spool, of a lever mounted in a stationary support, a spool-shaft provided with a plunger, ribbon-controlled means for moving said lever and plunger into effective position, and lugs on the ribbon-spool for returning said lever to normal position.

14. In a type-writing machine and in a ribbon-reversing mechanism, the combination with a power-shaft carrying gears, of a plurality of pairs of shifters provided with teeth, one pair of said shifters being provided with flanges, means for preventing endwise movement of one pair of shifters, spool-shafts provided with plungers, springs co-acting with said plungers, a ribbon-controlled lever whose path of movement is across the center of the ribbon-spool, adapted to cause said plunger to be projected into operative position and effect a reversal of the ribbon travel, and means for maintaining such reversal.

Signed at Norfolk, in the county of Norfolk, and State of Virginia, this 12th day of January, A. D. 1909.

GEO. M. KITZMILLER.

Witnesses:

H. L. SIMPSON,
W. G. COLLINGS.