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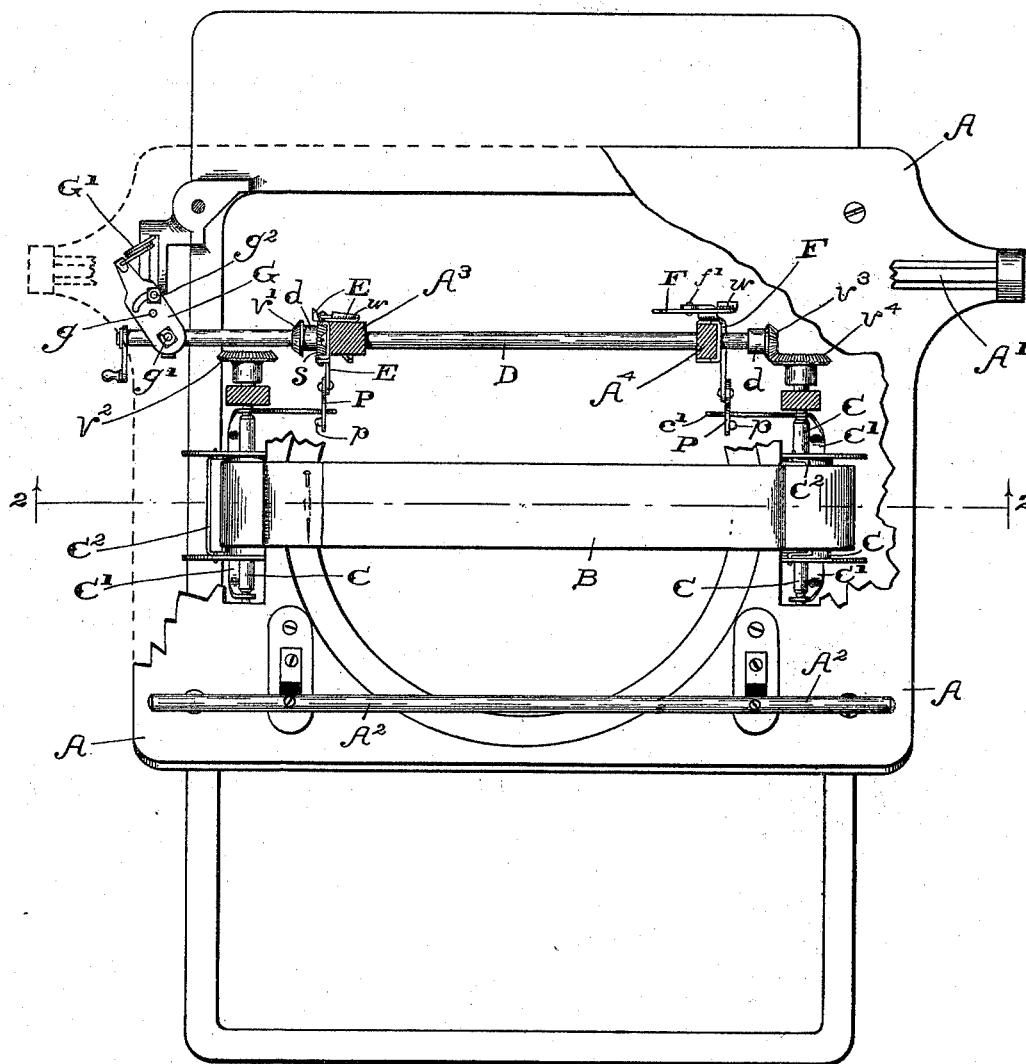
4 Sheets—Sheet 1.

C. E. JOHNSON.
RIBBON FEED REVERSING MECHANISM.

No. 526,783.

Patented Oct. 2, 1894.

Fig. 1



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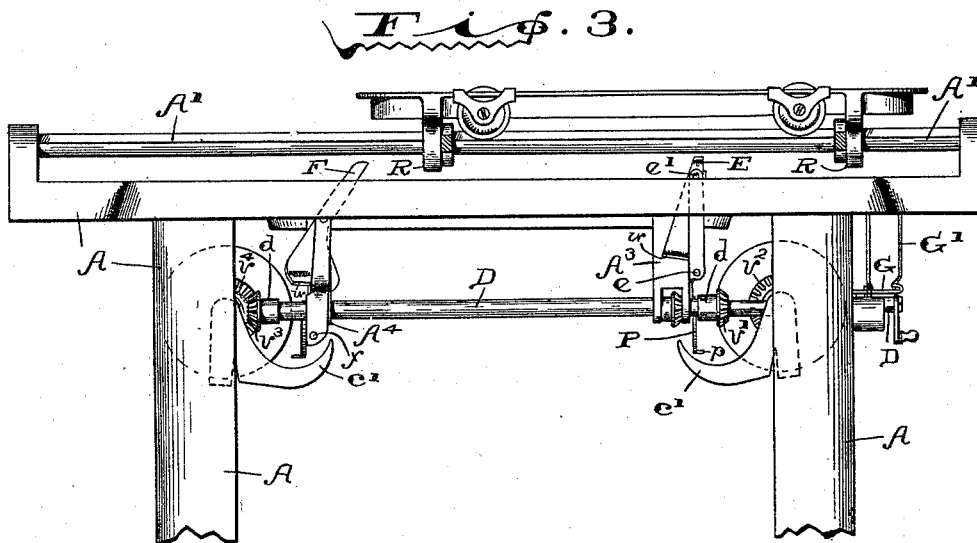
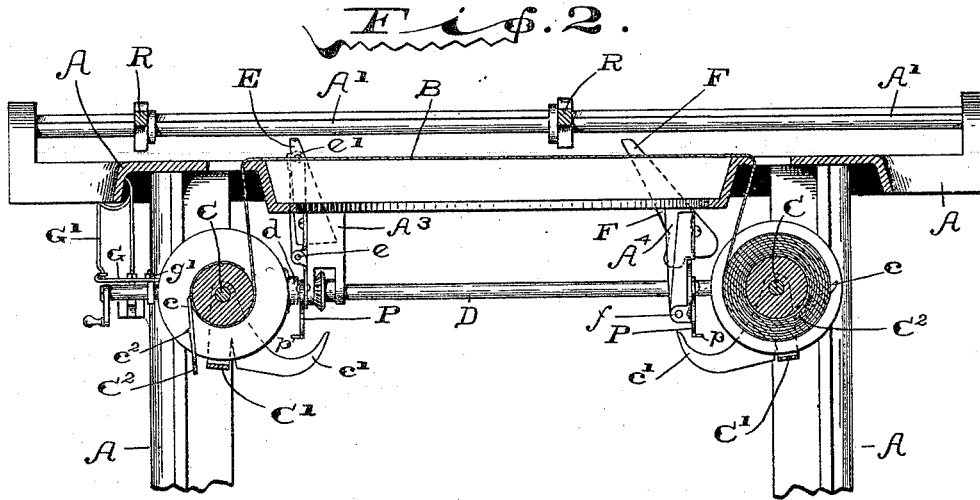
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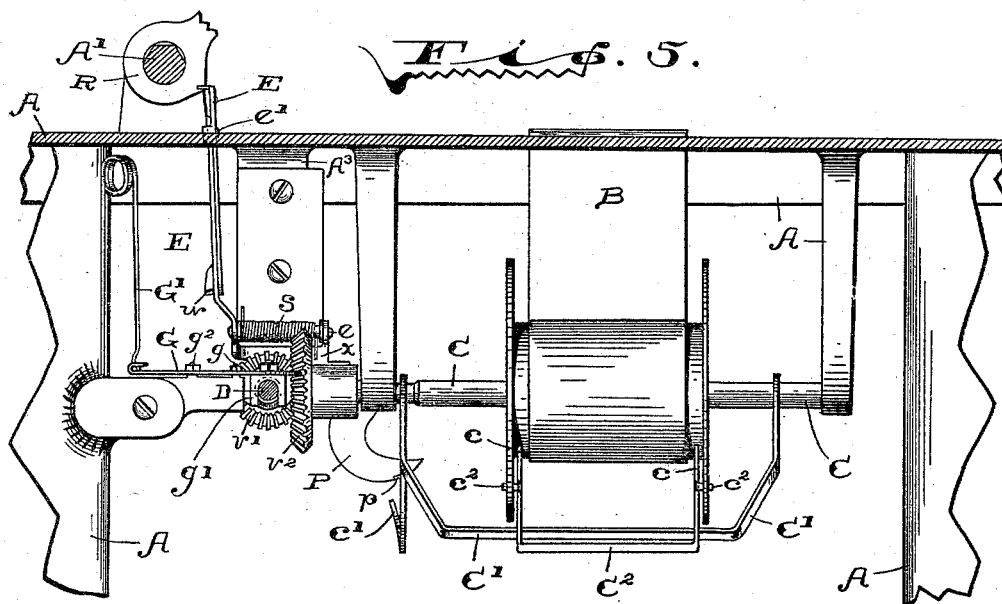
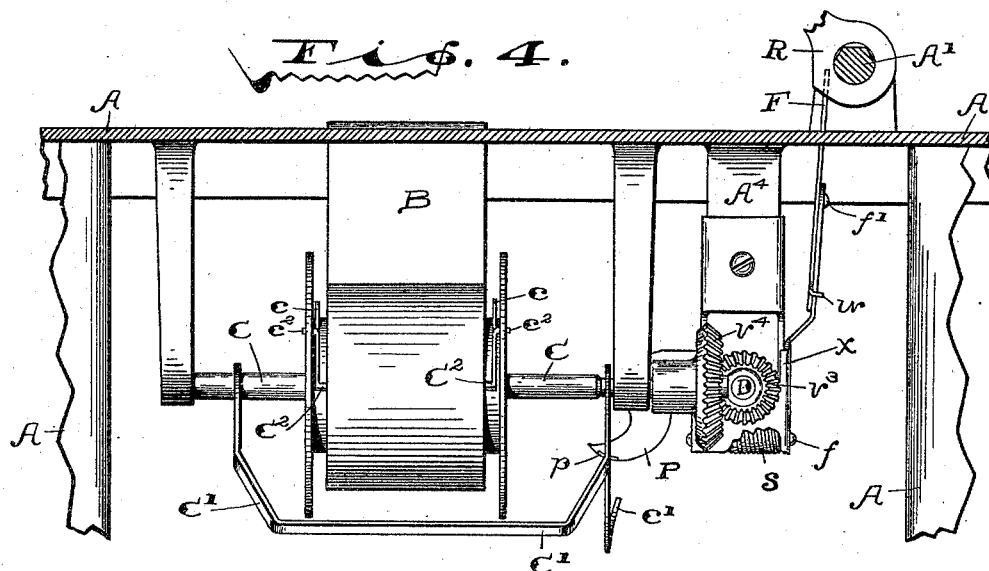
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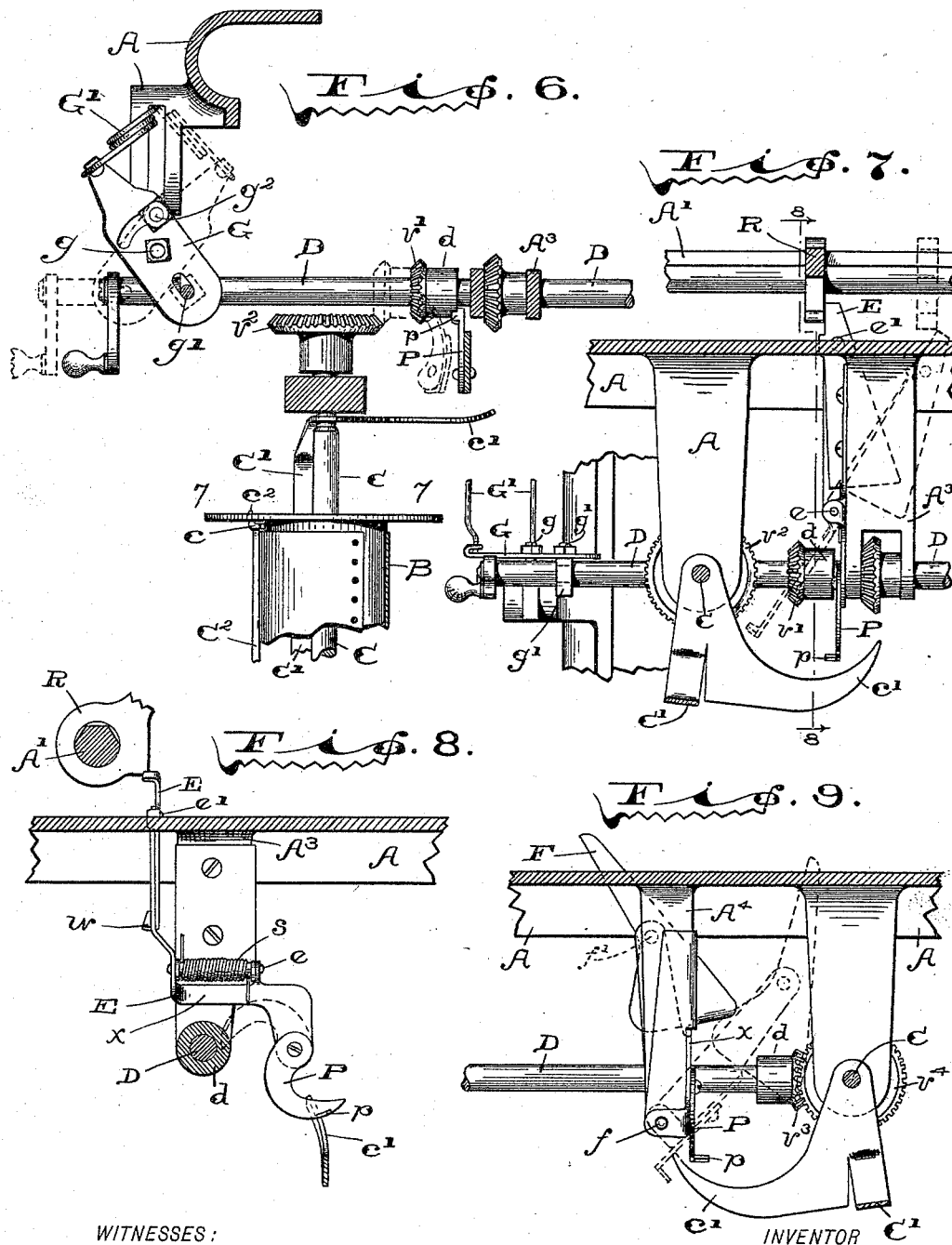
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UNITED STATES PATENT OFFICE.

CHARLES E. JOHNSON, OF MOUNT JACKSON, INDIANA.

RIBBON-FEED-REVERSING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 526,783, dated October 2, 1894.

Application filed August 31, 1893. Serial No. 484,429. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. JOHNSON, a citizen of the United States, residing at Mount Jackson, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Ribbon-Feed-Reversing Mechanism, of which the following is a specification.

Referring to the accompanying drawings, 10 which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a top or plan view of the frame-work of a "Remington" typewriting machine, together with the ribbon spools and 15 shafts by which they are operated, with my present invention attached thereto; Fig. 2, a central sectional view as seen when looking upwardly from the dotted line 2 2 in Fig. 1, of the upper portion of the frame-work and 20 the mechanism immediately relating to my invention, the other mechanism being removed; Fig. 3, a rear elevation of substantially the same parts shown in Fig. 2; Fig. 4, a fragmentary end elevation of said mechanism and the immediately adjacent portions 25 of the frame-work at the right hand end of the machine; Fig. 5, a similar view at the left hand end of the machine; Fig. 6, a horizontal sectional view similar in most respects to a 30 portion of Fig. 1, except that the shifting lever is in position to operate, and which also shows the other positions of the mechanism by means of dotted lines; Fig. 7, a detail sectional view looking upwardly from the dotted 35 line 7 7 in Fig. 6; Fig. 8, a detail sectional view looking toward the right from the dotted line 8 8 in Fig. 7, and Fig. 9 a view similar to Fig. 7 of the mechanism at the right hand end of the machine.

40 While, with certain structural modifications, my invention is applicable to use with any typewriter of this general construction, I have designed it especially for and shown it in connection with the machine known as the 45 "Remington." In the drawings, however, I have omitted all typewriter mechanism which does not pertain immediately to or is connected with my invention; but it will be understood in all cases that the regular "Remington" structure is intended.

In said drawings the portions marked A represent the frame-work of the typewriter;

B, the typewriter ribbon; C, the shafts of the ribbon spools; D, the shaft by which said spools are alternately driven; E, the shifting 55 lever at the left hand end of the machine; F, the shifting lever at the right hand end of the machine, and G a spring-actuated detent for holding the shaft D into either of its two positions. 60

As will be understood from my foregoing statements, the frame A, ribbon B, spool shafts C and spool driving shaft D, are in themselves of the usual construction in machines of this character, operate in the same way, and ac- 65 complish the same ends as in machines not provided with my invention.

Upon the frame A are the usual carriage track rails A' and A² upon which the usual paper carriage travels back and forth, and 70 which is, as usual, secured to the rail A' by ears R upon the carriage frame. These ears, as will be presently described, serve to operate the shifting levers, which are the main elements of my invention. 75

Loosely suspended to the spool shafts C are swinging frames C' which, during the ordinary operation of the machine, hang below said spools by their own gravity, and are not operative. They are provided with curved 80 arms c', which, upon occasion, when said frames are moved, are adapted to throw the pivoted operating points of the shifting levers into operative position.

Pivoted in holes in the heads of the ribbon 85 spools are U-shaped catch-bars C², and these, so long as there is any ribbon upon the spools, are held up alongside the spools, as shown at the right hand end of Fig. 2, but when the ribbon is nearly unwound, fall 90 down, as shown at the left hand end of Fig. 2, to a position so that the frames C' stand across the paths of their further movement, and, as the spools continue to revolve, these catch-bars come in contact with and drive 95 said frames forward thereunder, so that the points c' come in contact with the pivoted points of the levers, as will be presently more fully described. These catch-bars are light and journaled on the pivots or gudgeons c³, 100 beyond which extend arms c, which bear against the surface of the spool, so that they become rigid catches when permitted to drop down into the position shown at the left hand

of Fig. 2, while they easily fold up out of the way as the ribbon winds over them when moving in the reverse direction. The operation is that the ribbon spools move along in the ordinary manner until one is substantially unwound, exposing the catch-bar C^2 thereon, which drops down, and in its further movement, comes in contact with and operates the frame C' , thus throwing the parts of the corresponding shifting lever into position to operate. After this shifting lever has operated, the spool of course travels in the reverse direction, when the ribbon winds over the catch-bar C^2 , forcing it up against the body of the spool, where it remains during the whole remainder of the winding of the ribbon thereon, and also the unwinding, as it is wound back onto the other spool, after which the operation is repeated. So far as these attachments upon the spool shaft and spool are concerned, they are alike upon both ends of the machine, and operate in precisely the same manner.

As above indicated, the shaft D is of the usual and well known form, and carries the gears v' v^3 by which the ribbon-spool shafts are driven. These gears have hubs d , which, as will be presently described, play an important part in the operation of my invention.

The levers E and F extend from alongside the shaft D up through slots in the top of the frame-work A to points adjacent to the ears R on the paper carriage. They are pivoted to the hangers A^3 and A^4 in which the shaft D is mounted. Said lever E is pivoted above the shaft D on a pivot e , and is thus, in operation, a lever of the first order; while the lever F is pivoted below the shaft D upon the pivot f , and is thus a lever of the second order. Both levers are thus adapted to be operated by the ears on the ribbon carriage while said ribbon carriage is being moved back, and thus no part of the power of the spring which feeds the carriage forward in writing is consumed for the purpose of this invention, the power being supplied by the hand of the operator in moving the carriage back to the beginning of a new line. Both levers are made in two parts, and the upper portions are loosely pivoted upon the lower so as to be easily pushed over as the carriage feeds along, but are provided with catches or engaging points which render them stiff and rigid in the backward movement. These pivot points are at e' and f' , respectively, and, as will be seen by an examination of the drawings, the portions of the pivoted parts which are below these pivots are heavier than the portions above, so that they readily fall back into the proper positions after the ears R have passed over them as the carriage feeds forward, ready to engage with said ears as the carriage is pulled back, and they are stopped from moving too far in their return movement by flanges or projections w . The levers are returned to upright position, after

having been forced over by the ears R , by small springs, such as the springs s shown as coiled about the pivots e and f . These shifting levers are stopped from further movement when they reach an upright position by appropriate stop parts thereon, as x , which run across or are arranged to come in contact with some fixed part, such as the hangers A^3 and A^4 , upon which they are mounted, or some adjacent portion of the frame-work. These shifting levers are each provided with an operating point P pivoted thereto, which normally hangs loosely from the lower end of said lever, out of engagement with any part, so that, notwithstanding said levers are moved each time the carriage is driven back and forth, they have no effect upon the ribbon moving mechanism. These points are adapted to swing freely around the pivots by which they are attached to the main portions of the levers, and their length is such that they will swing free of the shaft D when it is alongside their path, but will strike and engage with the hubs d thereon when said hubs are in the proper position. They are also so formed at the points, by means of the side wings p thereon or otherwise, that they will fall behind the ends of said hubs, as well as rest thereon. In most of the drawings the parts are shown in that position which they occupy just before the lever E is caused to operate the rod D and thus reverse the ribbon moving mechanism.

Referring now again especially to Fig. 2, it will be seen that in the continued revolution of the spool at the left hand of said figure, the catch-bar C^2 will come in contact with the swinging frame C' and carry it forward, driving its curved arm c' into contact with the pivoted lever point P throwing the same over onto the hub d , the main portion falling behind said hub, while the wing p thereon rests on top of said hub. Manifestly, upon the next rearward movement of the paper carriage, the adjacent ear R will come in contact with the upper end of the lever E and force said lever backward, which, being in engagement, through the point P , with the hub d on the shaft D , will move said shaft in its bearings, and, as will be seen in Fig. 1, throw the beveled gear v' thereon into engagement with the gear v^2 on the adjacent ribbon spool shaft, at the same time separating the corresponding gears v^3 and v^4 at the other end of the machine, and thus shifting the direction of movement of the ribbon feeding mechanism, as will be readily understood.

As my invention provides an automatic means of operating the ribbon shifting mechanism at the proper times without any attention from the operator, it is of course necessary that the usual lock or catch whereby the ribbon feeding mechanism is held into that engagement which causes it to move the ribbon in one direction until shifted by the

hand of the operator should be removed, and a device substituted which, while equally effectual in holding the gearing into engagement, shall at the same time be capable of automatic movement. For this purpose I have provided the lever-like detent G, which is pivoted centrally at *g* upon that portion of the frame which usually carries the ordinary detent, and to the shaft D at *g'*, while its movement is limited by a stud *g²* passing down through a slot in the detent G and into the frame. In order that this should operate properly and hold the gears into operation, whichever way the device is shifted, and especially so that it will not stop on centers, I provide a spring G' one leg of which is pivotally fixed in the frame, and the other pivotally fixed in the end of this detent, while the center or upper portion preferably has one or more coils. This spring, as will be readily understood upon an examination of the drawings, particularly Figs. 1 and 6, operates upon the lever-like detent G in either position in which it is placed, while yielding sufficiently to permit it to be swung from one position to the other. It will also, as its spring force is continually exerted, as will be readily understood, effectually prevent said detent from stopping on "dead centers" or at any point intermediate the limit of its movement, and this insures that one set or the other of the gears *v' v²*, or *v³ v⁴* shall always be in engagement. As the shaft D is, of course, continually revolving, it is necessary that the pivot *g'*, whereby it is connected to the detent G, should be in the form of a yoke engaging with a groove in said shaft, as shown most plainly in Figs. 5 and 7.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in an automatic ribbon feed reversing mechanism, of the ribbon spools, swinging frames upon said spools, arms on said swinging frames, catch-bars pivoted within the heads of the spools, the ribbon adapted in winding to draw said catch-bars close to the spools and in unwinding to permit them to drop out and engage with the swinging frames, shifting levers, the upper ends of which extend into the path of the traveling carriage and the lower ends of which extend down adjacent to the spool-driving shaft, and pivoted points on said levers adapted to be operated by the arms on the frame and thrown into engagement with hubs or projections on said shaft, substantially as set forth.

2. The combination, in a ribbon feed reversing mechanism, of levers for engaging with and shifting the ribbon-spool feeding devices, pivoted points on said levers, frames or arms suspended from the shafts of the spools and adapted when the ribbon is unwound to throw the lever points into engagement with the feed mechanism, the traveling carriage

adapted to come in contact with and operate said levers, and means on the spools for operating said frames or arms substantially as set forth.

3. The combination, in a ribbon feed reversing mechanism, with the feed mechanism, of levers extending up through the frame and into the path of the traveling carriage, said levers consisting of two parts, the upper pivoted upon the lower and provided with catches or projections whereby said upper part is enabled to yieldingly swing on its pivot as the carriage travels past it in one direction, but remain rigid in the other direction, substantially as set forth.

4. The combination, in a typewriting machine, of the traveling carriage, ribbon feeding mechanism, ribbon feed reversing mechanism, a lever formed of two parts jointed together, flexible in one direction and stiff in the other, secured to the frame-work and connected to said mechanism, the upper end whereof extends up through a slot in the frame-work into the path of said traveling carriage, and a spring whereby said lever is held and returned to its former position after the traveling carriage has passed, substantially as shown and described.

5. The combination, in a ribbon feed reversing mechanism, with the feeding mechanism, of a frame pivoted to the ribbon-spool shaft and hanging loosely thereon, and a U-shaped catch-bar pivoted within the heads of said ribbon spool and adapted to extend out and engage with said frame in one direction and provided with arms extending in the other direction whereby it is held rigid in operation, substantially as shown and described.

6. The combination, in a ribbon feed reversing mechanism, with the feed shaft, of levers for operating said feed shaft provided with pivoted swinging points of such a length that they will pass said shaft when alongside the body thereof, but will come in contact and engage with hubs or projections thereon when said hubs or projections are alongside said points, substantially as and for the purposes set forth.

7. The combination, in a ribbon feed reversing mechanism for typewriting machines, with the shifting lever, of a pivoted engaging point P thereon provided with a wing or side projection *p*, substantially as shown and described.

8. The combination, in a ribbon feed reversing mechanism, of the spools, the mechanism whereby they are operated, and two levers for shifting or reversing said feeding mechanism extending therefrom up through the frame into the path of the carriage, one of said levers being pivoted above said feeding mechanism and the other below, whereby the carriage is adapted to operate both when moving in the same direction, whereby consumption of the usual carriage-feeding power is avoided.

9. The combination, in a ribbon feed reversing mechanism, of the ribbon spools, the shiftable feed mechanism for operating the same, and two reversing levers adapted to
5 engage with said feed mechanism at the lower end and extending up through the frame into the path of the carriage, whereby they are thus adapted to be operated to shift said feeding mechanism, and devices whereby upon the
10 unwinding of the ribbon at either end, one or the other of said levers is thrown into operation, substantially as shown and described.

10. The combination, in a ribbon feed reversing mechanism, of the feed shaft D, the

lever-like detent G pivoted to a portion of the 15 frame alongside said shaft at *g* and attached to said shaft by a yoke-like pivot *g'*, a limiting stud or bolt *g''*, and an operating spring G' pivoted to the frame at one end and to said lever-like detent at the other end, sub- 20 stantially as shown and described.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 23th day of July, A. D. 1893.

CHAS. E. JOHNSON. [L. s.]

Witnesses:

CHESTER BRADFORD,
JAMES A. WALSH.