

G. W. DAVIS.
 RIBBON REVERSE MECHANISM FOR TYPE WRITERS.
 APPLICATION FILED JAN. 3, 1907.

1,003,345.

Patented Sept. 12, 1911.

3 SHEETS—SHEET 2.

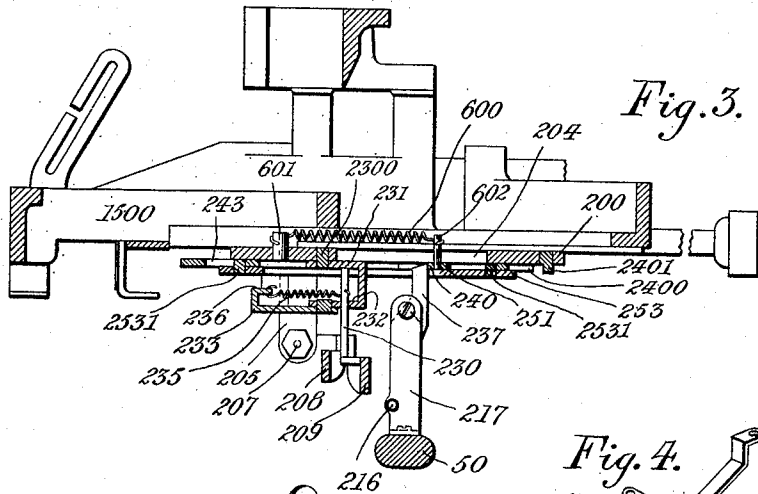


Fig. 3.

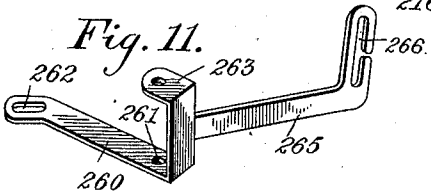


Fig. 11.

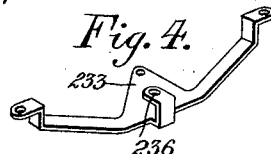


Fig. 4.

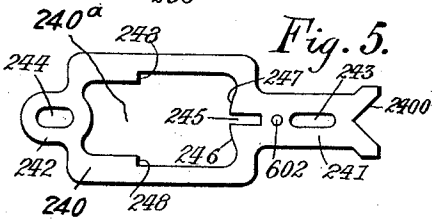


Fig. 5.

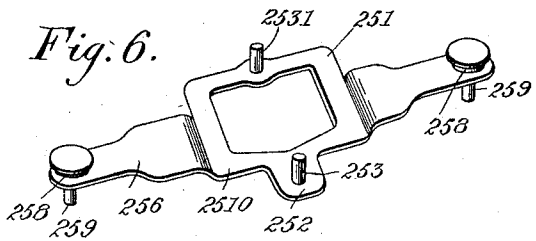


Fig. 6.

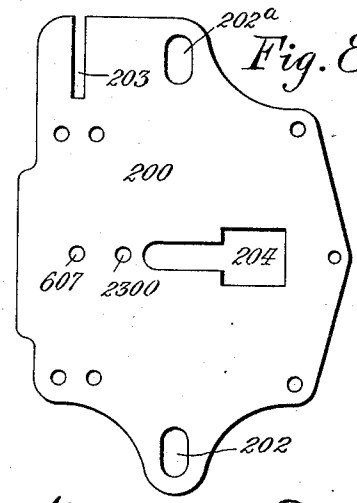


Fig. 8.

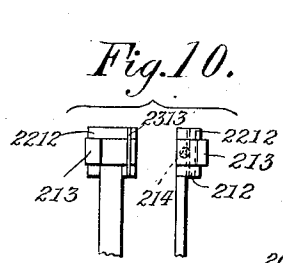


Fig. 10.

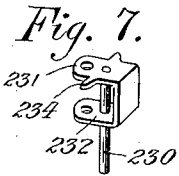


Fig. 7.

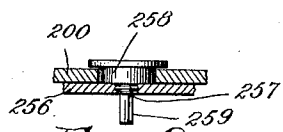


Fig. 9.

Witnesses
Geo. Page
Geo. Shaw

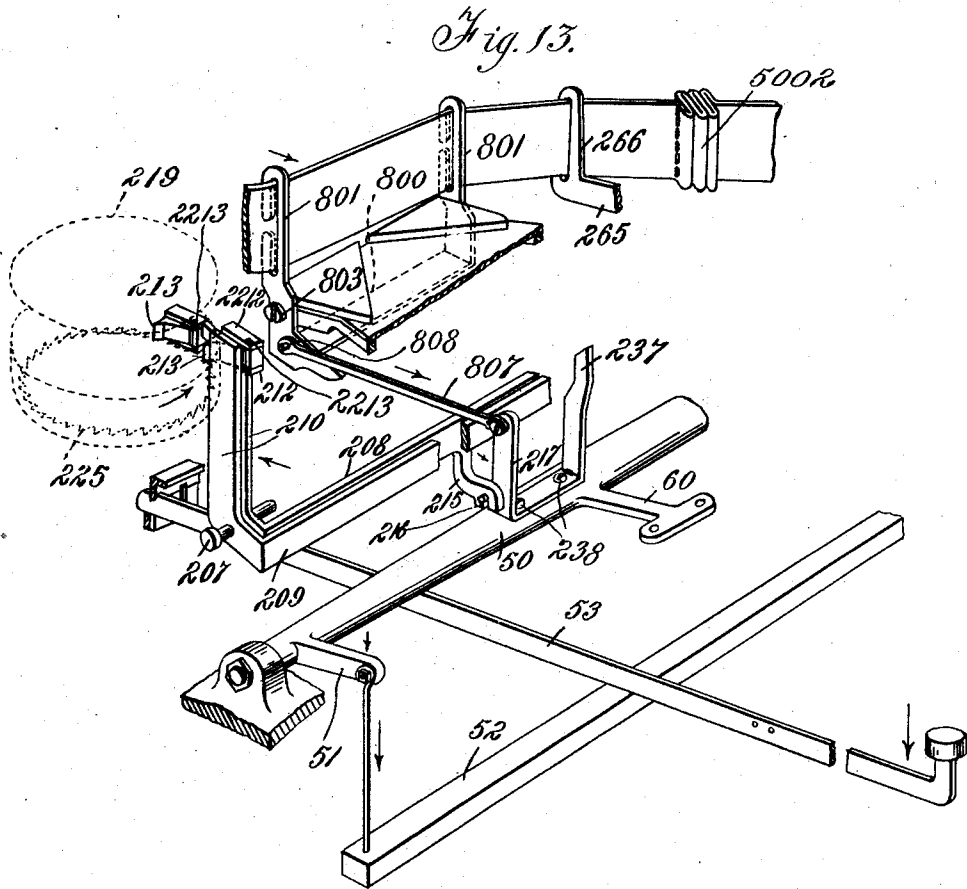
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UNITED STATES PATENT OFFICE.

GEORGE WILLIAM DAVIS, OF WESTMOUNT, QUEBEC, CANADA.

RIBBON-REVERSE MECHANISM FOR TYPE-WRITERS.

1,003,345.

Specification of Letters Patent. Patented Sept. 12, 1911.

Application filed January 3, 1907. Serial No. 350,633.

To all whom it may concern:

Be it known that I, GEORGE WILLIAM DAVIS, of Westmount, in the district of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Ribbon-Reverse Mechanism for Type-Writers; and I do hereby declare that the following is a full, clear, and exact description of the same.

The object of my invention is to provide a positively actuated ribbon reversing mechanism, and to simplify and render more durable the ribbon mechanism generally.

The invention may be said to consist of the several combinations and arrangements of parts hereinafter described and pointed out in the claims.

For full comprehension, however, of the invention reference must be had to the accompanying drawings forming a part of this specification in which like symbols indicate the same parts and wherein,

Figure 1 is a front elevation of the portion of the machine frame carrying the ribbon feed and reversing mechanism; Fig. 2 is an underside view thereof; Fig. 3 is a sectional view, on a line extending from front to rear of the said mechanism; Figs. 4, 5, 6, 7, 8 and 9 are detail views of the members of the said mechanism; Fig. 10 illustrates one of the feeding pawls in front and side elevation; Fig. 11 shows a perspective view of one of the ribbon actuated reversing arms, Fig. 12 is a detail side elevation of the end of one of the ribbon feeding levers; and Fig. 13 illustrates in perspective view the operative connection between the key levers and the ribbon spools.

The improved ribbon feed mechanism and reversing mechanism are independent of each other in that the ribbon feed works independently of the reversing mechanism and none of the members of the latter are in action except during the actual time the ribbon is being reversed. These improved mechanisms are supported by a plate 200 secured by screws 201 to the top frame 1500 of the machine and formed with a series of three guiding transverse slots 202, 202^a, and 203, and a central clearance slot 204. A pair of depending arms 205 are secured by screws 206 to the top frame of the machine and a pair of screws 207 threaded through tapped perforations in the lower ends of these arms 205 have a pair of levers 208, 209 fulcrumed thereon and each

being of substantially U-form. The lever 208 constitutes a ribbon feed lever and 209 a check lever to limit the extent of rotation imparted to the ribbon spools by the feed lever. Each end of each of these levers is bent at right angles thereto as at 210 and provided with a pair of lugs 212 and an enlarged bent end 2212 to form a box in which a pawl 213 is pivotally secured by a pin 2213, while an expansible spring 214 behind the pawl yieldingly retains it normally with its engaging edge out of the box.

The ribbon feed lever 208 has a depending diagonally slotted forwardly projecting arm 215 adapted to have in permanent engagement therewith a lateral pin projection 216 upon a vertical arm 217 secured rigidly to the universal bar 50, each vibration of which oscillates the said ribbon-feed and causes the pawls in the ends thereof to engage and rotate ratchet wheels of the particular ribbon spool 219 with which it happens to be in operative relation. The pawls of the check lever 209 retain the spools in any positions to which they are rotated by the feed levers.

The ribbon is reversed by shifting the levers 208 and 209 to move the pawls carried thereby, and at one side of the machine, out of engagement with the ratchet wheel (say for instance 225) of the ribbon spool at that side, and move the pawls at the opposite ends of the levers, and therefore at the other side of the machine, into engagement with the ratchet wheel 206^a of the other ribbon spool. This shifting of the levers is permitted by the length of the screws 207 upon which they are fulcrumed the extent thereof is adjusted by screwing the said screws into or out of the depending arms 205 in which they are mounted, while a pair of jam nuts 227 set the screws in any position to which they may be adjusted. This shifting of the levers is effected by a pin 230 engaging a slotted projection 228 upon the check lever 209; the latter and the feed lever 208 being bent apart to accommodate check lever 20 retain the spools in any position such projection. The pin 230 is carried rigidly by an oscillatory dog consisting of plate bent into U-form with one leg 231 pivoted (by means of a pin 2300) to the plate (200) and the other, 232, to a bridge-plate 233 secured to the said plate 200. The leg 232 has a pair of teeth 234 on opposite sides of the pivot point. The pin extends through

the leg 232 and finds bearing in both the latter and the leg 231, and a retractile cylindrical spring 235 is connected at one end to this pin and at its other end to a tongue 236 projecting from the opposite side of the bridge and bent above the same and projecting toward the key board. This spring maintains the dog yieldingly on whichever side of the pivot point it is moved. A reversing bar is provided through the medium of which this dog is shifted from side to side of its pivot point, by means of an upwardly projecting arm 237 carried by the universal bar 50 and preferably formed with the arm 217 from a single strip of metal secured in place by screws 238. This reversing bar consists of a frame plate 240 having forward and rearward extensions 241 and 242 respectively, formed with central longitudinal guiding slots 243 and 244, the forward extension also having an angular notch 2400 adapted to engage an angular projection 2401 upon the bottom of plate 200 when at the forward end of its travel for the purpose of again moving this reversing bar back to its normal central position. The forward end of this frame plate is formed with a slot 245 communicating with an opening 240^a and the adjacent end of such opening presents bearing faces 246, 247, while the opposite sides of the said openings, a short distance from the opposite end, have a pair of inwardly projecting shoulders 248 and 249.

A transversely reciprocatory carrier is operated by the ribbon 250, through the medium of a pair of reversing arms 265, to shift the reversing bar to bring the bearing faces 246, 247 alternating (as the ribbon near the end of its travel in either direction) into the path of the arm 237, and one of the shoulders 248 and 249 into position to engage one of the teeth of the reversing dog. This reciprocatory carrier consists of a frame 251 chambered in its upper side as at 2510 to receive the reversing bar, and having its forward end formed with an extension 252 carrying a stud 253 adapted to engage the guiding slot 243 in the corresponding extension of the said reversing bar, while a similar stud 2531 carried by the rear end of the carrier engages the guiding slot 244 in the opposite extension 242 of such reversing bar. A pair of wings 256 upon the carrier are slidably connected to the plate (200) by threaded studs 257 provided with heads and shoulders 258 and each having its lower end diminished to form a tennon 259, the head resting upon the top of the plate 200 and supporting the carrier into which it is threaded while the shoulders are located in the slots 202 and 202^a, and the tennons afford a sliding pivotal connection 259 with the forward ends of the ribbon reversing arms 265. Each of the reversing arms com-

prises a forked portion, one (260) of the prongs whereof is elongated and perforated as at 261 at its inner end and longitudinally slotted, as at 262, at its outer end, the other prong 263 being perforated and with the inner end of the prong 260 constituting a pair of bearings straddling the top frame 1500 of the machine to which they are connected by a pivot pin 264. An arm 265 extends rearwardly from the forked portion at a slight outward angle (relatively to the machine) and has its rear end extending vertically and formed with a vertical slot 266, open about midway of its height, to receive the ribbon.

A retractile spring 600 is connected at its opposite ends to a pair of pins 601, 602 carried, respectively, by the plate 200 and the bar 240. This spring is for the purpose of causing the bar 240 to automatically resume its normal position.

The operation of this ribbon feed reversing mechanism is as follows:—When the ribbon is almost entirely unwound from one of the spools, the projection or rib thereon (presented by the folds 5002) near such spool, engages the adjacent reversing arm 265 and carries the end of the latter with it, thereby shifting the carrier 251 and the reversing bar 240 in the opposite direction, thus moving the contiguous bearing face (say, for instance, 246) of the bar 240 into the path of the arm 237 upon the universal bar. Simultaneously as the ribbon tightens it tends to move the upper ends 801 of the ribbon rocker toward the platen, against the resistance of spring 804 which permits of this movement and, as may be mentioned here, this spring returns the rocker to its normal position with its arms 801 away from the platen, thus, it is apparent, the next stroke of either the space bar or a key-lever will cause the said arm 237 to bear upon the said bearing face 246 and move the reversing bar forwardly. Simultaneously with the positioning of the said bearing face the shoulder (say for instance 248) on the corresponding side of the bar is placed into position to have its path intersected by the tooth 234 on the adjacent side of the dog (231, 232), and the forward movement just mentioned of the said bar 240 will cause the said shoulder 248 to carry the tooth before it and shift the dog. This action shifts the ribbon-feed and check levers and causes the pawls which have been idle to move into operative relation with the other spool.

The ribbon rocker is shown in Figs. 1, 2 and 13 and consists of a U-bar pivoted to the frame of the machine and presenting arms 801 adapted to engage the ribbon, a spring 804 tending to retain the said arms 801 of the rocker normally inclined away from the platen, and a link 807 operatively

connects such rocker to the arm 217 of the universal bar 50. One of the key levers of the machine is indicated at 53.

What I claim is as follows:

5 1. In a typewriting machine the combination with the top frame of the machine, a pair of rotatory ribbon drums, and ratchet toothed disks in operative connection therewith, of a bar of less length than the distance between the disks and having its ends bent, pawls carried by the bent ends of such bar, means actuated synchronously with each writing action for oscillating the said bar to move the pawls to and from operative relation with one of the disks, and means for at times shifting the said member from one disk to the other.

2. In a typewriting machine, the combination with a pair of rotatory ribbon drums, and ratchet toothed disks in operative connection therewith of a device consisting of a pair of levers of less length than the distance between the disks and fulcrumed to oscillate transversely pawls carried by the opposite ends of such levers, means actuated synchronously with each writing action for oscillating the said levers to and from operative relation with one of the disks, and means for at times shifting the said device from one disk to the other.

3. In a typewriting machine, the combination with a pair of rotatory ribbon drums, and ratchet toothed disks in operative connection therewith of a device consisting of a pair of coaxially fulcrumed substantially U-form levers of less length than the distance between the disks, pawls carried by the opposite ends of such levers, means actuated synchronously with each writing action for oscillating the said levers to and from operative relation with one of the disks, and means for at times shifting the said device from one disk to the other.

4. The combination with a supporting frame, a pair of ribbon drums, and a pair of ratchet toothed disks in operative relation with the drums, of a pair of trunnions upon the frame, an oscillatory drum rotating device fulcrumed upon the said trunnions, pawls mounted upon such device, means for oscillating the said device in a direction intersecting the line in which the disks lie, and means for at times shifting the said device upon the trunnions to bring the pawls into operative relation with the drums alternately.

5. In a typewriting machine the combination with a key lever, a pair of ribbon drums, and a pair of ratchet toothed disks in operative relation with the drums, of a drum rotating device, means shiftably supporting the device adjacent to the disks, pawls mounted upon such device, means for vibrating the said device synchronously with each action of the key lever, and means

for at times shifting the said device to bring the pawls into operative relation with the drums alternately.

6. In a typewriting machine, the combination with a key lever, a supporting frame, a pair of ribbon drums, and a pair of ratchet toothed disks in operative relation with the drums, of a pair of trunnions upon the frame, an oscillatory drum rotating device fulcrumed upon the said trunnions, pawls mounted upon such device, means for oscillating the said device synchronously with each action of the key lever, and means for at times shifting the said device upon the trunnions to bring the pawls into operative relation with the drums alternately.

7. In a typewriting machine the combination with the frame thereof, a pair of ribbon drums, and a pair of ratchet toothed disks operatively connected to the drums, of levers slidably fulcrumed upon the frame, spring pawls carried by such levers, means operatively connected to one of the levers for imparting oscillatory movement thereto, means operatively connected to the other of the said levers whereby they are shifted from one to the other of the drums.

8. In a typewriting machine the combination with the frame thereof, a pair of ribbon drums, and a pair of ratchet toothed disks operatively connected to the drums, of a pair of levers 208, 209 of U-form slidably fulcrumed upon the frame, spring pawls carried by the ends of such levers, means operatively connected to the lever 208 for imparting oscillatory movement thereto, means operatively connected to the lever 209 whereby the said levers are shifted simultaneously from one to the other of the drums.

9. A ribbon drum rotating device consisting of a toothed disk a vibratory lever having lugs forming a box, a pawl fulcrumed in such box, and a spring normally retaining the said pawl projecting out of the box.

10. The combination, with key lever, and a ribbon feeding device, of a member adapted to be moved by the ribbon when the latter nears the end of its travel in either direction, a member operated by the key lever and vibrating synchronously with each typing action, means upon the movement whereof the direction of feed is reversed, and means actuated by the ribbon operated member for effecting an operative connection between the member operated by the key lever and the feed reversing means.

11. The combination with key lever, and a ribbon feeding device, of a member adapted to be moved by the ribbon when the latter nears the end of its travel in either direction, a member operated by the key lever, means operatively connected to the said ribbon operated member, means operatively connected to the feeding device, and inter-

mediate means through the medium where-
of the means connected to the ribbon oper-
ated member is caused by the member oper-
ated by the key lever to operate the means
5 connected to the feeding device for the pur-
pose of reversing the direction of feed.

12. The combination with key lever, and
a ribbon feeding device, of a member adapt-
ed to be moved by the ribbon, a carrier mov-
10 able with such member, a transversely mov-
able reversing bar mounted upon the car-
rier, a member operated in unison with each
action of the key lever and adapted to act
upon and move the reversing bar when the
15 latter has been moved by the ribbon oper-
ated member, and a shifting device in opera-
tive relation with the feeding device and
adapted to be acted upon the reversing bar
when the latter has been moved by the rib-
20 bon operated member.

13. The combination with key lever and
a ribbon feeding device, of a pair of levers
adapted to be at different times moved in
25 different directions by the ribbon, a slid-
able plate pivotally connected to the said levers
and having an opening, a reversing bar mov-
able with such plate and independently
thereof transversely thereto and having an
30 opening coinciding with the first mentioned
opening, such bar presenting within the
opening at one end thereof and on opposite
sides of the longitudinal center of the bar
separated bearing faces and having on op-
35 posite sides of the said opening a pair of
shoulders, a lever actuated by the key lever
and projecting into the said openings and
arranged to normally operate idly between
the said bearing faces, a movable device op-
40 eratively connected to the ribbon feeding
device and adapted to at times be acted upon
by the reversing bar for the purpose of re-
versing the action of the said feeding
device.

14. The combination with key lever and

a ribbon feeding device, of a pair of levers 45
adapted to be at different times moved in
different directions by the ribbon, a slid-
able plate pivotally connected to the said levers
and having an opening, a reversing bar mov-
able with such plate and independently 50
thereof transversely thereto and having an
opening coinciding with the first mentioned
opening, such bar presenting within the
opening at one end thereof and on opposite 55
sides of the longitudinal center of the bar
separated bearing faces and having at op-
posite sides of the said opening a pair of shoul-
ders, a lever actuated by the key lever and
projecting into the said openings and ar- 60
ranged to normally operate idly between the
said bearing faces, an oscillatory device hav-
ing diametrically opposite teeth, a spring re-
taining the said device on either side of the
center of oscillation, and a sliding pivotal 65
connection between the said device and the
ribbon feeding device, for the purpose of
reversing the action of the said feeding de-
vice.

15. In a typewriting machine of the class
utilizing a platen, a ribbon, and a universal 70
bar with an upwardly projecting arm, the
combination with the frame of the machine,
of a ribbon rocker comprising a member
adapted to slidably retain the ribbon, means
whereby the said member is pivotally sup- 75
ported upon the frame, a spring operatively
connected to the said member and retaining
the same inclined away from the platen, and
a link operatively connecting the said up-
wardly projecting arm to the said member. 80

In testimony whereof, I have signed my
name to this specification, in the presence of
two subscribing witnesses.

GEORGE WILLIAM DAVIS.

Witnesses:

WILLIAM P. McFEAT,
FRED J. SEARS.