

Oct. 10, 1933.

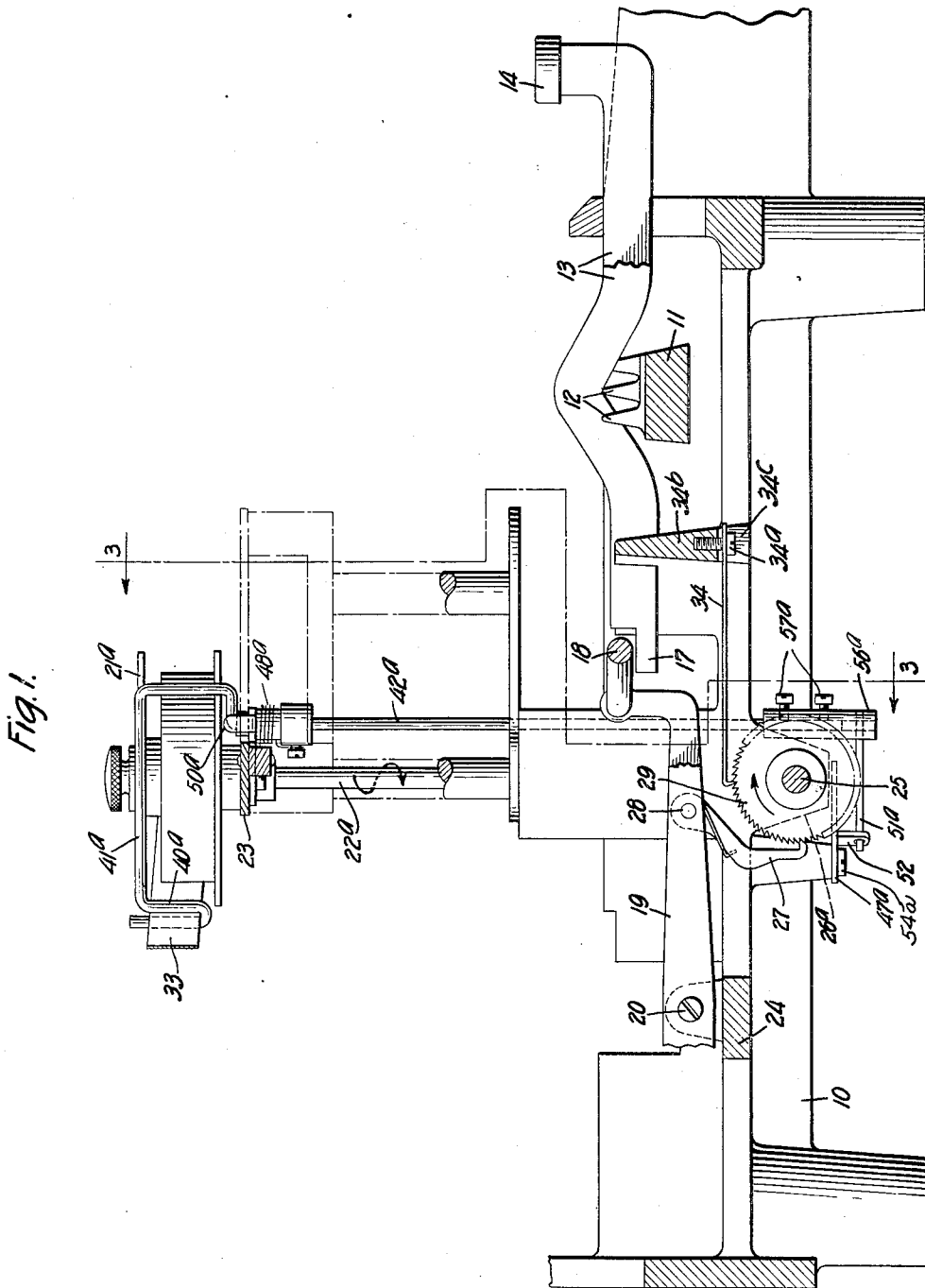
F. H. TREGO

1,930,068

RIBBON REVERSING MECHANISM FOR TYPEWRITING MACHINES

Filed March 19, 1930

4 Sheets-Sheet 1



INVENTOR
Frank H. Trego.
BY *John Waldheim.*
ATTORNEY

Oct. 10, 1933.

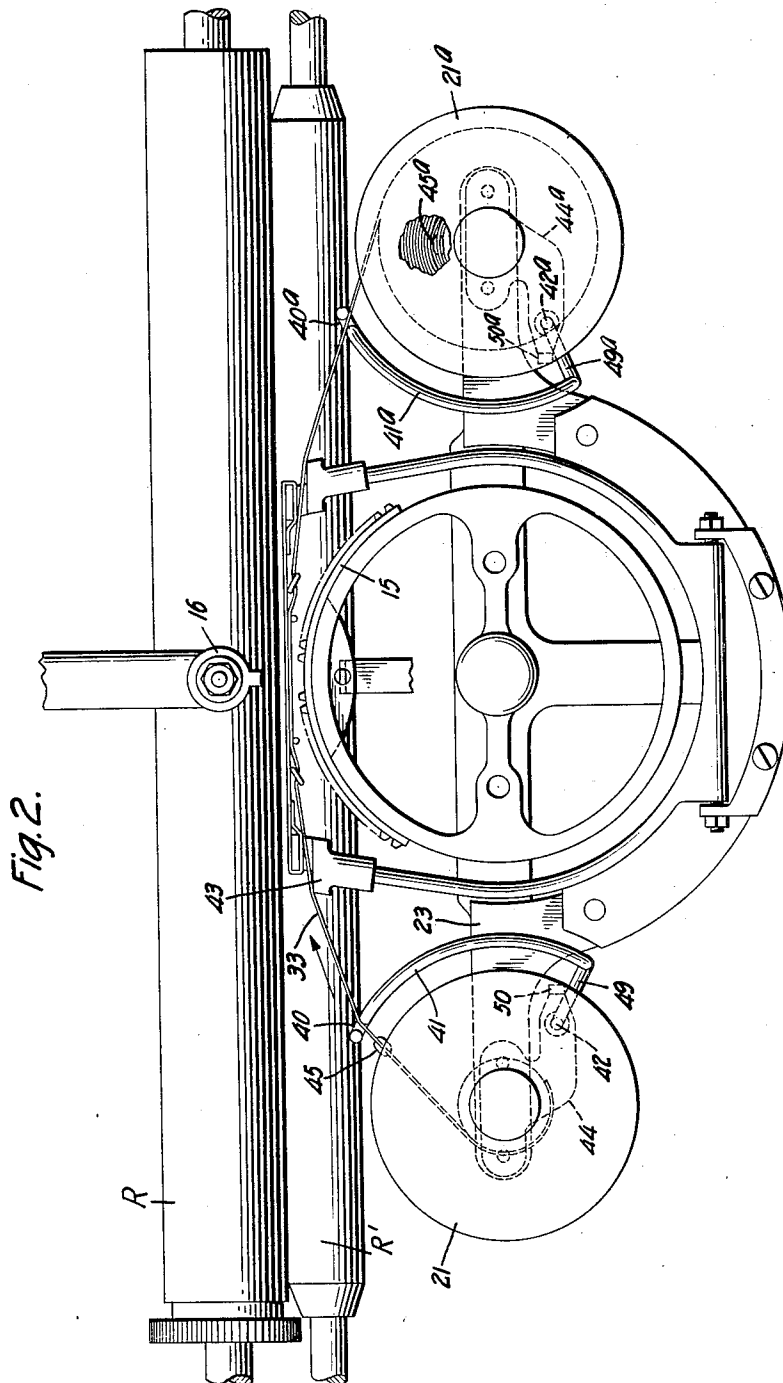
F. H. TREGO

1,930,068

RIBBON REVERSING MECHANISM FOR TYPEWRITING MACHINES

Filed March 19, 1930

4 Sheets-Sheet 2



INVENTOR
Frank H. Trego.
BY *John Waldheim*
ATTORNEY

Oct. 10, 1933.

F. H. TREGO

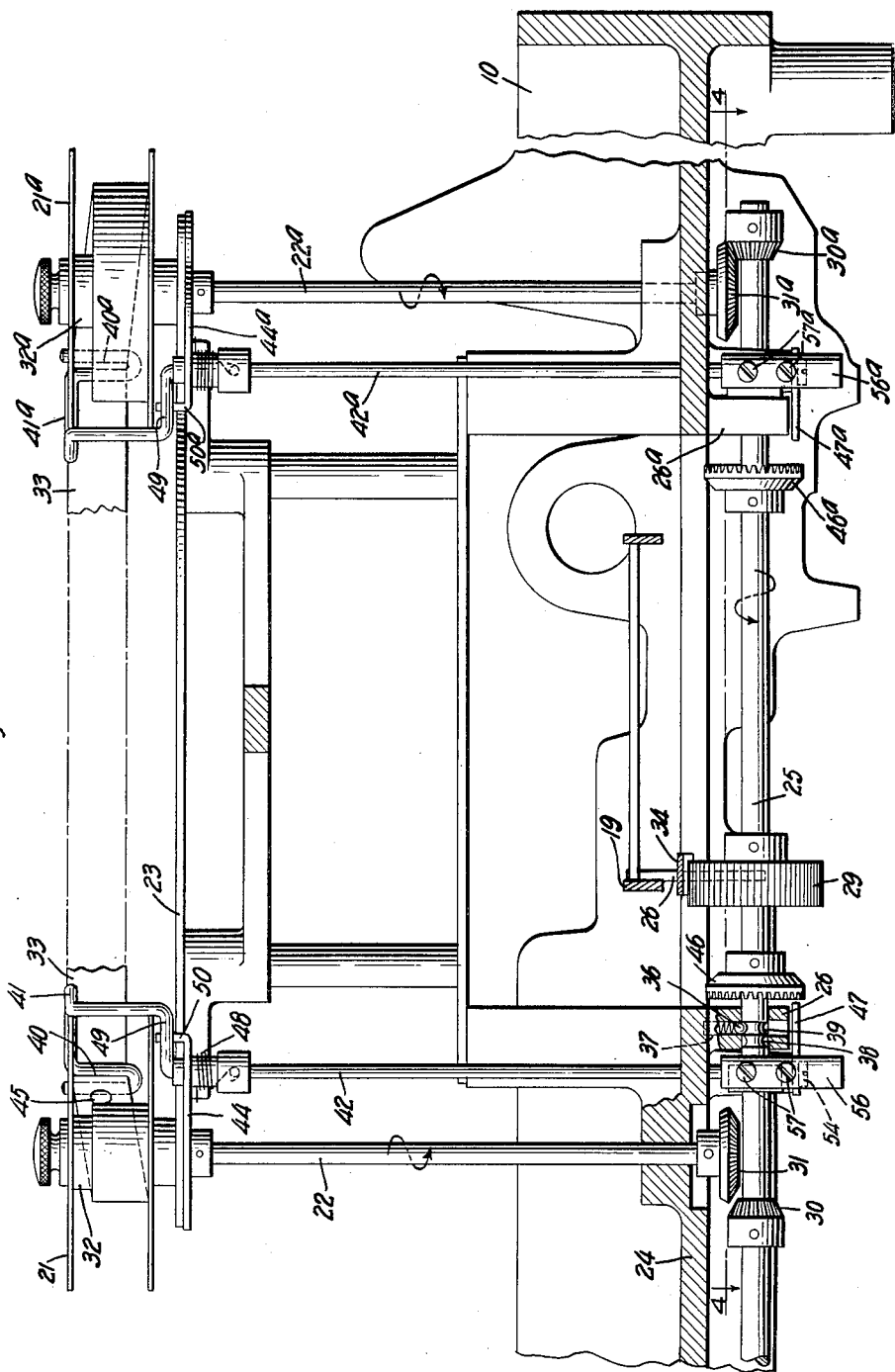
1,930,068

RIBBON REVERSING MECHANISM FOR TYPEWRITING MACHINES

Filed March 19, 1930

4 Sheets-Sheet 3

Fig. 3.



INVENTOR
Frank H. Trego.
BY *John Waldheim*
ATTORNEY

Oct. 10, 1933.

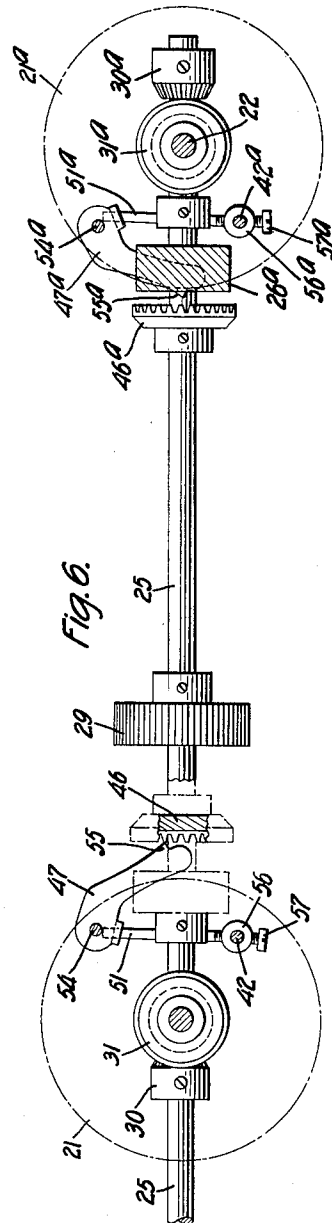
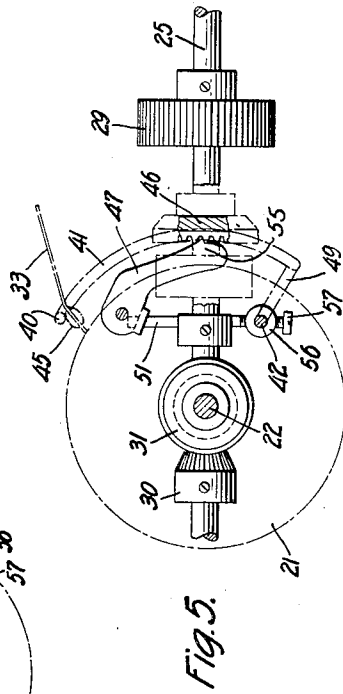
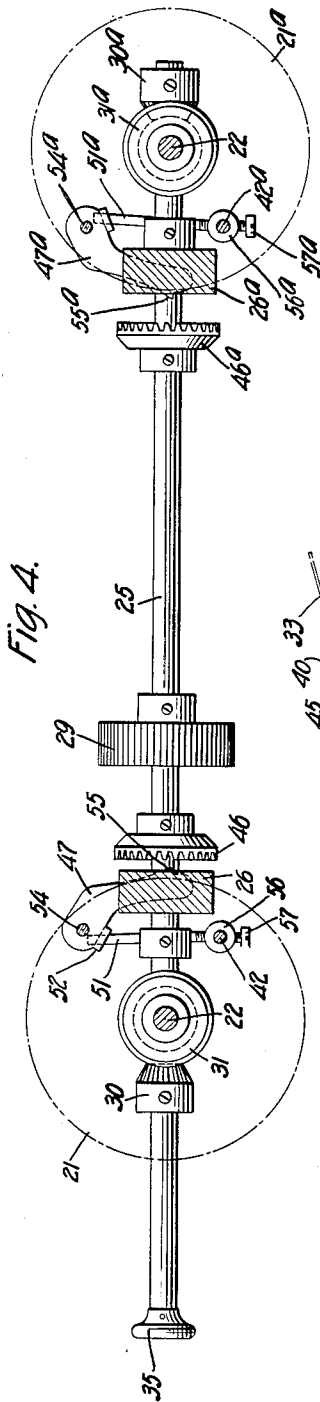
F. H. TREGO

1,930,068

RIBBON REVERSING MECHANISM FOR TYPEWRITING MACHINES

Filed March 19, 1930

4 Sheets-Sheet 4



INVENTOR
Frank H. Trego.
BY John Waldheim
ATTORNEY

UNITED STATES PATENT OFFICE

1,930,068

RIBBON REVERSING MECHANISM FOR
TYPEWRITING MACHINES

Frank H. Trego, New York, N. Y., assignor, by
mesne assignments, to Ralph C. Coxhead Cor-
poration, New York, N. Y., a corporation of
Delaware

Application March 19, 1930. Serial No. 436,969

2 Claims. (Cl. 197-165)

This invention relates to improvements in type-
writing machines and more particularly to ribbon
reversing mechanism therefor.

An object of the invention is to provide efficient
5 ribbon reversing means which is simple in con-
struction and which may be manufactured eco-
nomically.

The ribbon spools are supported, one on each
10 of two shafts, either of which shafts may be
connected to a transverse drive shaft operable,
through intermediate means, by the key levers,
to feed the ribbon.

The ribbon reversing means includes two
15 toothed wheels secured to the drive shaft, which
are normally ineffective, each one having asso-
ciated therewith a pawl to effect a shifting of the
drive shaft and thus reverse the feed of the rib-
bon.

The pawls are normally out of engagement with
20 the toothed wheels. As the end of the ribbon
is approached on one spool, an element on the
ribbon engages a ribbon guide arm to actuate a
shaft having an actuating arm connected there-
to; said actuating arm engaging one of the pawls
25 to swing it into engagement with the associated
toothed wheel. Upon subsequent rotation of the
drive shaft the latter is shifted axially through
the co-operation of the pawl with its toothed
wheel, thus disconnecting one of the spool shafts
30 and connecting the other with the drive shaft.

A feature of the invention relates to a novel
element which is bent up from a single piece of
wire to constitute the pawl actuating shaft and
the ribbon guide arm. The pawl actuating arm
35 is adjustably secured to said element so that it
may be properly located thereon relatively to
the pawl actuated thereby.

Other features and advantages will hereinafter
appear.

40 In the drawings,

Fig. 1 is a sectional side elevation of part of the
machine showing the invention applied thereto;

Fig. 2 is a fragmentary top plan view of the
machine;

45 Fig. 3 is a sectional front view taken on the
line 3-3 of Fig. 1;

Fig. 4 is a fragmentary top plan view taken
on the line 4-4 of Fig. 3, showing the ribbon re-
versing means inactive;

50 Fig. 5 shows the ribbon reversing pawl, at the
left-hand side of the machine, thrown into en-
gagement with its co-operating element by means
actuated by the ribbon; and

Fig. 6 is a view similar to Fig. 4 showing the
55 drive shaft shifted to disconnect the spool shaft

at the right and connect the one at the left to
thus reverse the feed of the ribbon.

Similar reference characters represent similar
parts throughout the several views.

The invention is illustrated in connection with
60 a Varityper writing machine which includes a
main frame 10 having a cross bar 11 provided
with fulcrums 12 about which key levers 13 may
be actuated. When a character key 14 is de-
pressed the key lever operates the printing in-
65 strumentalities including a type shuttle 15 and
a hammer 16 (Fig. 2) by means, not shown. The
rear end 17 of each key lever engages a universal
bar 18 to swing a frame 19, by which it is carried,
about pivots 20 to actuate suitable escapement
70 mechanism not shown to feed the carriage, in-
cluding feed rollers R and R' by which a work-
sheet is fed up between the type shuttle and the
hammer 16.

Ribbon spools 21 and 21^a are suitably connected
75 to the upper ends of vertical shafts 22 and 22^a,
said shafts being guided at their upper ends
by a plate 23 secured to the machine frame 10,
the lower ends of said shafts being guided in a
plate 24 of the main frame.

A transverse shaft 25, to drive the shafts 22 and
80 22^a, is supported in bearings 26 and 26^a extending
downwardly from the plate 24; said shaft being
rotated slightly at each actuation of a key lever
by a spring pressed pawl 27 pivotally supported
85 by a stud 28 on the universal bar frame 19,
said pawl engaging a ratchet 29 secured to the
drive shaft 25. The rotation of the drive shaft
is transmitted through pinions 30 and 30^a to
gears 31 and 31^a secured to the lower ends of
90 the spool shafts 22 and 22^a to rotate the latter.
The pinions 30 and 30^a are spaced sufficiently
apart so that only one of them engages with its
co-operative gear at a time.

The ribbon spools 21 and 21^a have cores 32
95 and 32^a to which the opposite ends of a ribbon
33 are attached so that the ribbon may be wound
on either spool while it is being delivered from
the other. As illustrated in Figs. 3 and 4 the
drive shaft 25 is connected with the spool shaft
100 22^a. Consequently the ribbon is being wound on
the spool 21^a by the shaft 22^a which is being
rotated in the direction of the arrow in Fig. 3
by said drive shaft 25.

To prevent backward rotation of the drive
105 shaft 25 while the feed pawl 27 moves back to
normal, there is provided a detent or back pawl
34. So as not to interfere with the touch of the
key levers, this detent 34, instead of pressing
against the ratchet wheel 29, as heretofore, mere-
110

ly rests upon it at one end. The other end of the detent is loosely supported by a shouldered screw 34^a threaded into a key lever guide bar 34^b. To prevent the free end of the detent 34 from moving laterally out of engagement with the ratchet 29, said detent is located in a slot 34^c formed in the bar 34^b.

To manually reverse the feed of the ribbon the drive shaft 25 may be shifted laterally, by a finger piece 35 thereon (Fig. 4), to disconnect the gears 30^a and 31^a and connect the gears 30 and 31 so that subsequent rotation of the shaft 25 drives the spool shaft 22 in the direction of the arrow (Fig. 3) to wind the ribbon on the spool 21. A spring-pressed ball detent 36, located in a hole 37 of the bearing post 26, engages in grooves 38 and 39 on the shaft 25 to hold the latter in either of its axial positions to maintain engagement of the pinions 30 and 30^a with their gears 31 and 31^a, respectively, according to the axial position of said shaft.

The ribbon 33 is conducted from the spool 21 to a guide 40 (Fig. 2) of an arm 41 integral with a vertical shaft 42. It passes from the guide 40 to a ribbon vibrator 43 which is actuated, at each printing operation, by the key levers through means not shown. From the vibrator 43 the ribbon passes to a guide 40^a of an arm 41^a on a vertical shaft 42^a, and then to the spool 21^a.

The shafts 42 and 42^a are supported at their upper ends in brackets 44 and 44^a, respectively, and are guided at their lower ends in the plate 24 of the main frame. They are actuable by heads 45 and 45^a on opposite ends of the ribbon 33 to initiate the automatic reverse of the ribbon, the ribbon reversing operation being completed through means operated by the drive shaft 25 in a manner hereinafter described.

The automatic ribbon reversing mechanism includes two toothed wheels 46 and 46^a on the drive shaft 25, and pawls 47 and 47^a to co-operate therewith; said pawls being normally ineffective as shown in Fig. 4. When the end of the ribbon on the spool 21 is reached the head 45 thereon actuates the arm 41 to the position in Fig. 5, thus rotating the vertical shaft 42 against the action of a return spring 48, which spring normally holds an engaging portion 49, of the arm 41, against a stop 50 on the bracket 44. An arm 51, secured to the lower end of the shaft 42, engages an ear 52 of the element or pawl 47 to swing the latter about a pivot 54 on the main frame, and cause a tooth 55 of said pawl to engage the toothed face of the crown wheel 46 as indicated in Fig. 5. Subsequent rotation of the drive shaft 25, which is effected by the key levers as previously described, swings the pawl 47 further about its pivot 54, from the position in Fig. 5, to move said drive shaft rightwardly to connect the pinion 30 with the gear 31 and disconnect the pinion 30^a from the gear 31^a as in Fig. 6, the detent 36 being effective to complete the axial shifting of the drive shaft to snap the wheel 46 out of engagement with the pawl 47 (Fig. 6) whereupon the pawl is immediately returned toward normal by the return spring 48 connected to the shaft 42. When the ribbon starts to wind on the spool 21 the head 45 moves away from the guide 40, thus permitting the spring 48 to complete the return of the pawl 47.

The various parts of the ribbon reversing

means at the right-hand side of the machine, which are similar to those at the left-hand side, bear the same reference characters with the superscript *a*, and it will be understood that their operation effects an axial movement of the drive shaft 25 leftwardly (Fig. 3) to connect the ribbon spool 21^a and disconnect the spool 21.

The pawl actuating arms 51 and 51^a are threaded into sleeves 56 and 56^a, respectively, the latter being secured to the shafts 42 and 42^a by screws 57 and 57^a. It will be understood that with this arrangement the arms 51 and 51^a may be adjusted horizontally to the ears 52 and 52^a of the pawls 47 and 47^a.

It will be understood that the ribbon guide 40, arm 41 and shaft 42 are made up of a single piece of wire bent to form the various parts.

Thus there is provided simple ribbon reversing mechanism which can be manufactured economically, and which is highly efficient in its operation.

Having thus described the invention it should be understood that alterations and changes may be made without departing from the spirit of the invention as defined in the appended claims.

I claim:—

1. In a typewriting machine, the combination of a ribbon, two ribbon spools, two shafts one for each spool, to which said spools are connected, a transverse driving shaft connectable to either of the spool-supporting shafts, key-levers, means operable by said key-levers to rotate said driving shaft, a crown toothed wheel on said shaft, a horizontally disposed pivoted pawl to swing perpendicularly into engagement with the toothed face of said wheel, a vertical ear on said pawl, means including a horizontally disposed arm extending into said ear, said means being operable by said ribbon to swing said pawl into engagement with said wheel so that subsequent rotation of the drive shaft effects a longitudinal movement thereof through the cooperation of the pawl with said wheel to disconnect the drive shaft from one of said spool shafts and connect it with the other spool shaft, and a return spring for said pawl.

2. In a typewriting machine, the combination of a drive shaft, means to rotate the latter, two driven shafts, a ribbon passing from one of the driven shafts to the other, gears on all of the shafts whereby the drive shaft may rotate the driven shafts one at a time, crown ratchets extending in opposite directions on the drive shaft, two normally ineffective pawls, one for each ratchet to co-operate therewith to effect an axial movement of the drive shaft so as to connect it with one of the driven shafts and disconnect it from the other shaft, fixed pivots for said pawls, upwardly extending pawl operating shafts, each of the last named shafts having an arm at its upper end to rotate it by the ribbon, and an arm at its lower end connected to one of the pawls to swing the latter into engagement with the associated ratchet so that the ratchet by subsequent rotation of the drive shaft rotates the pawl to shift the drive shaft axially to change its connection with the driven shafts, and a spring connected to each pawl operating shaft to restore it and the connected pawl to normal.

FRANK H. TREGO.