

W. F. HELMOND.
TYPE WRITING MACHINE.
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931,303.

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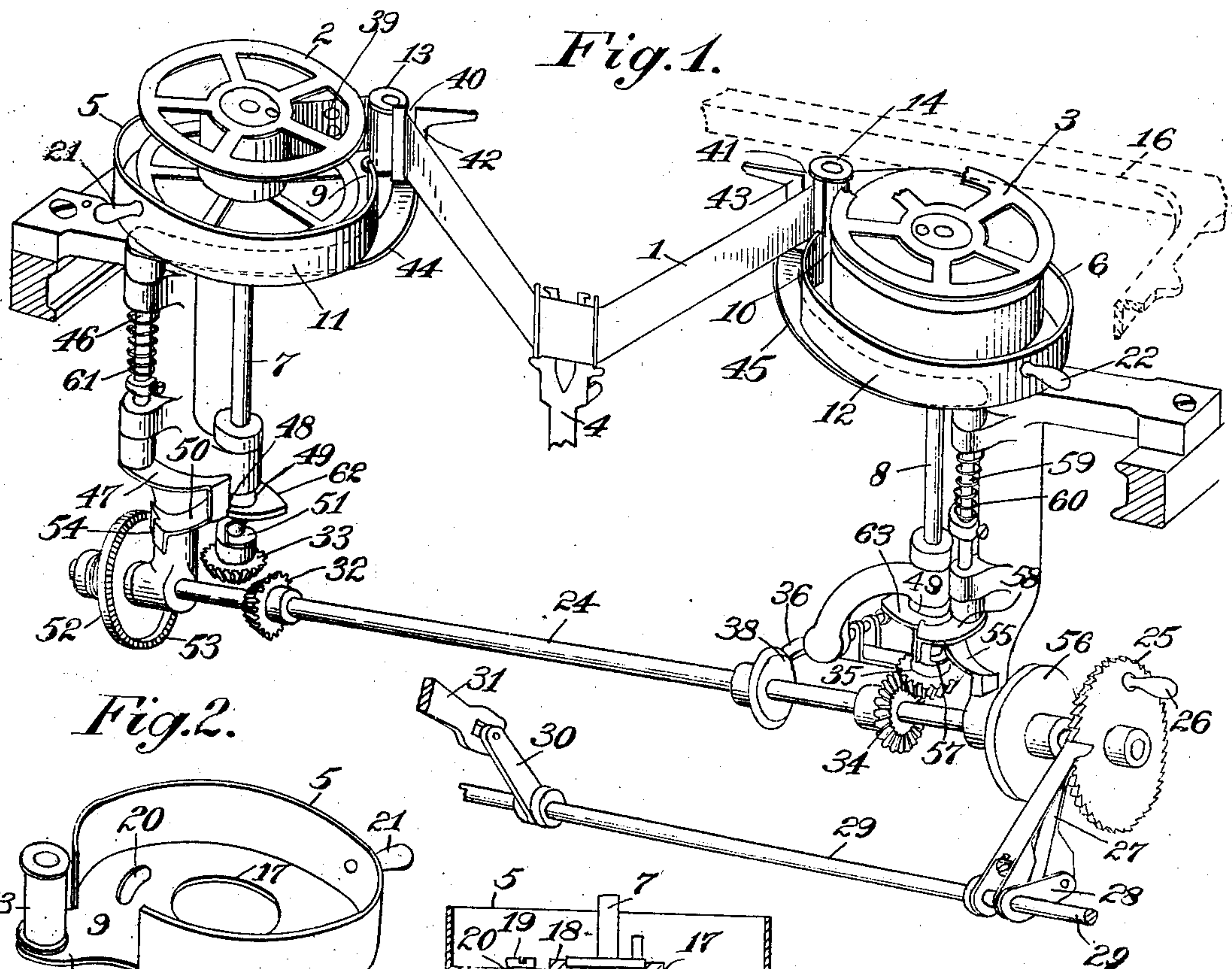


Fig. 2.

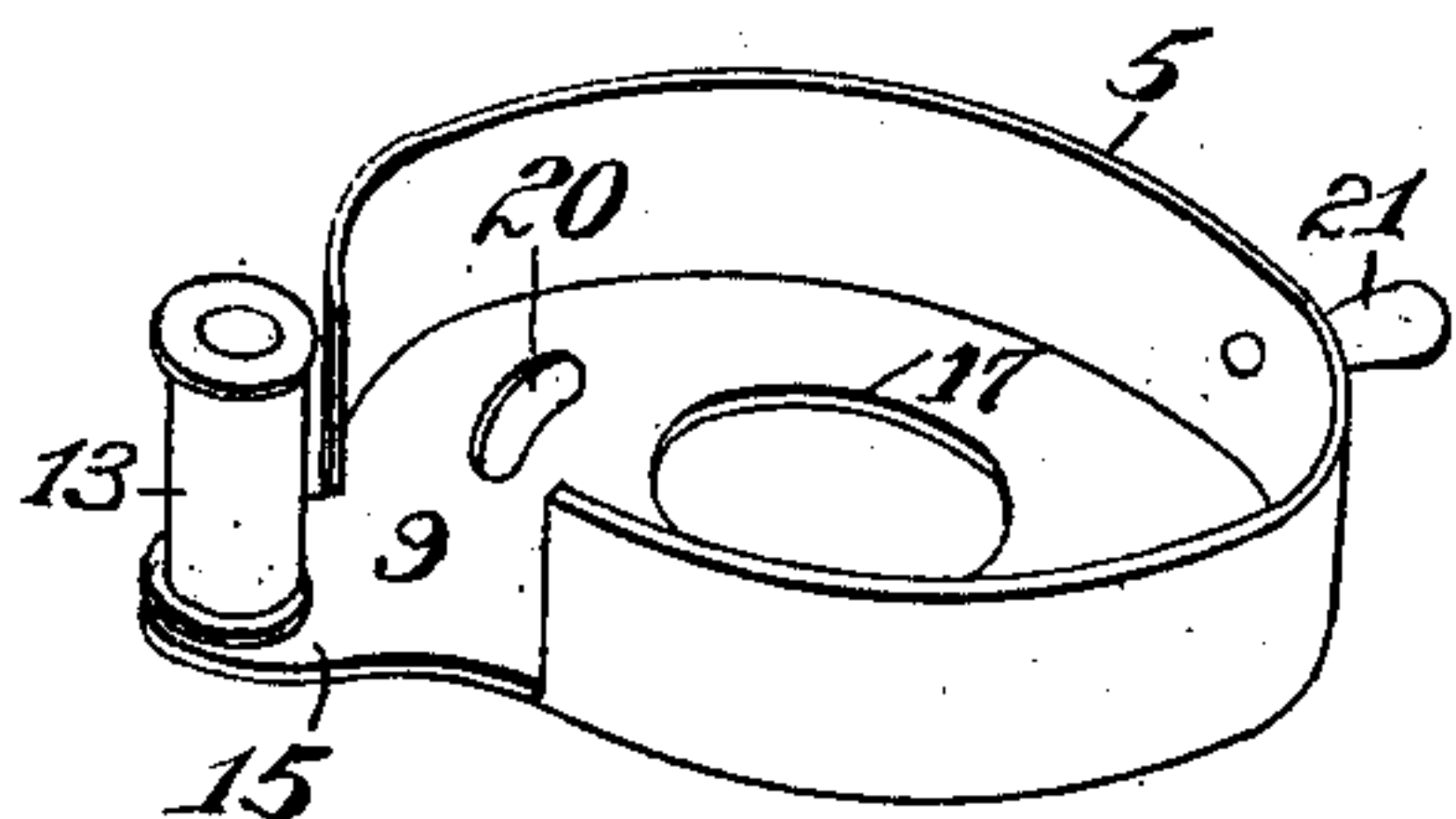


Fig. 4.

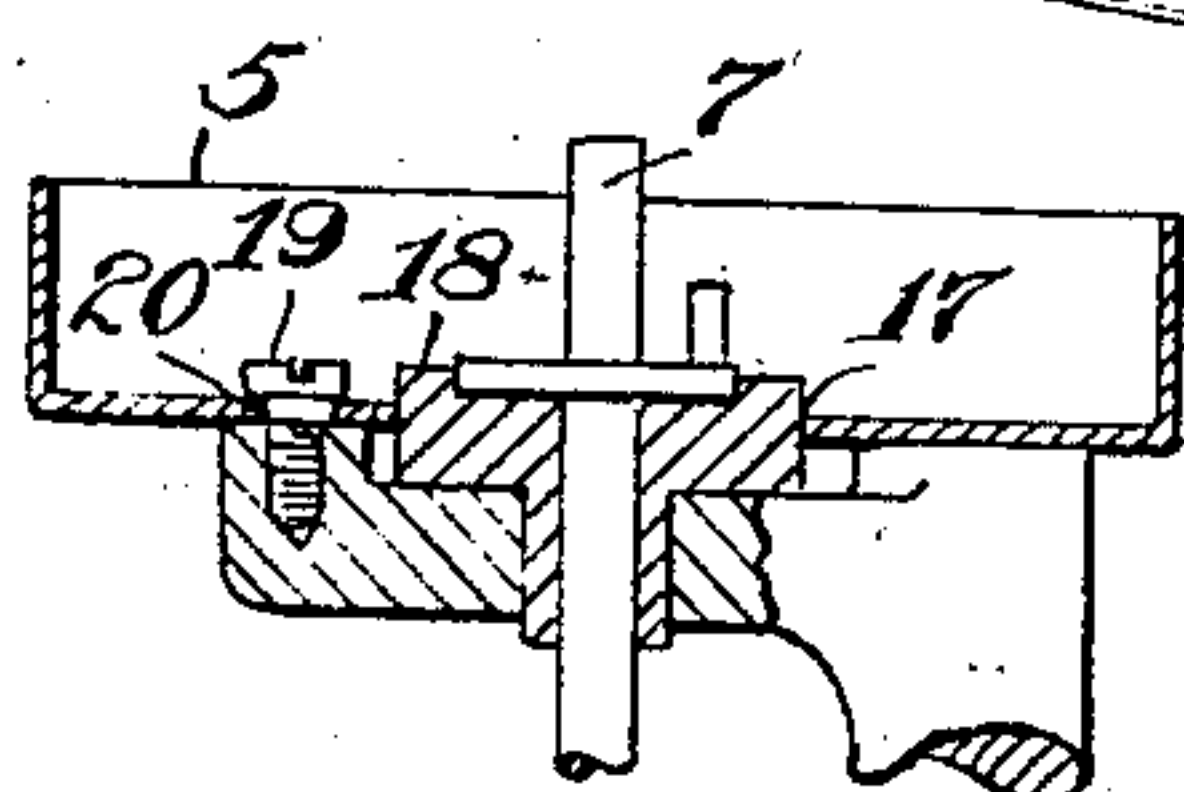


Fig. 3.

Fig. 5.

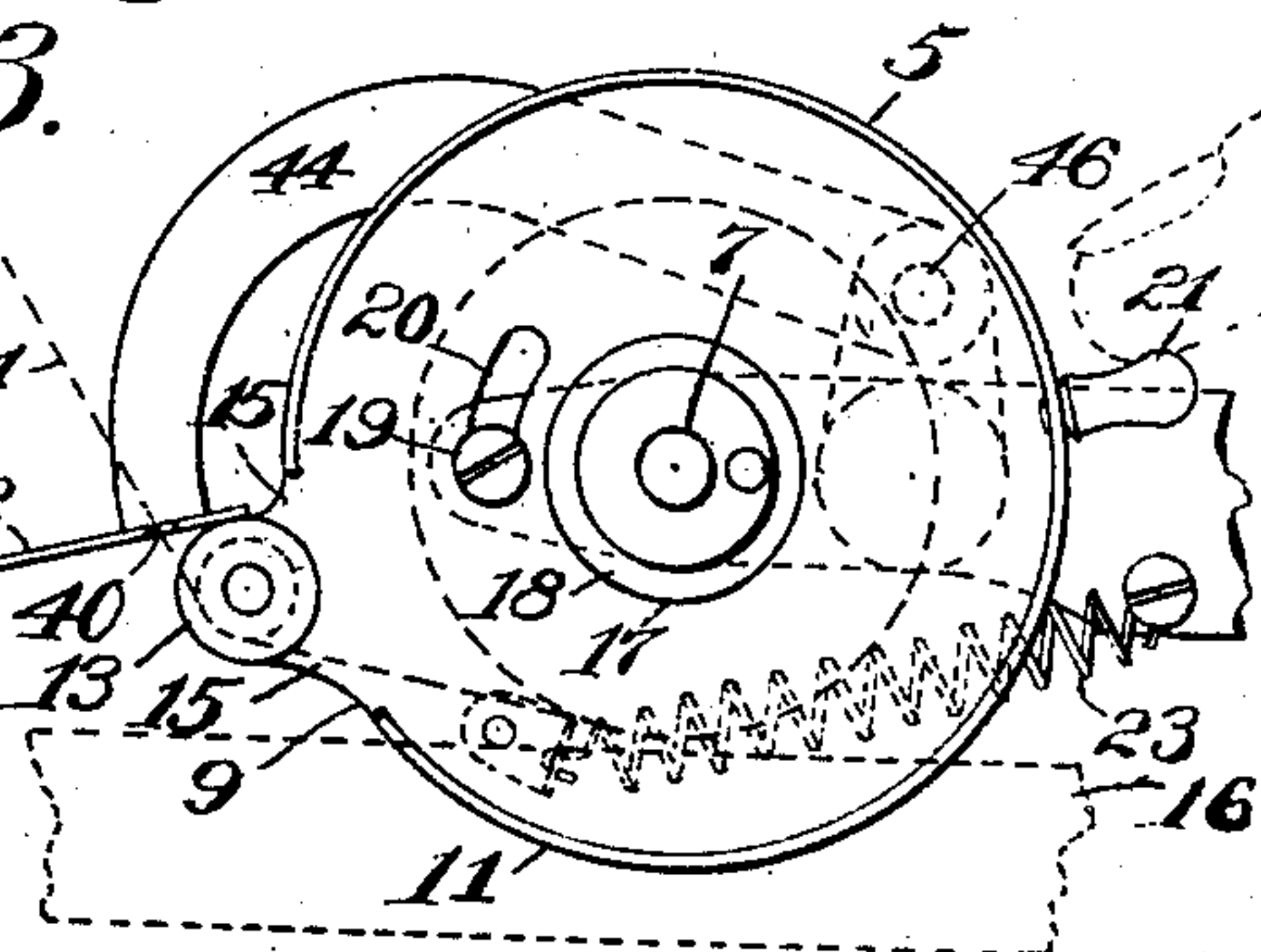
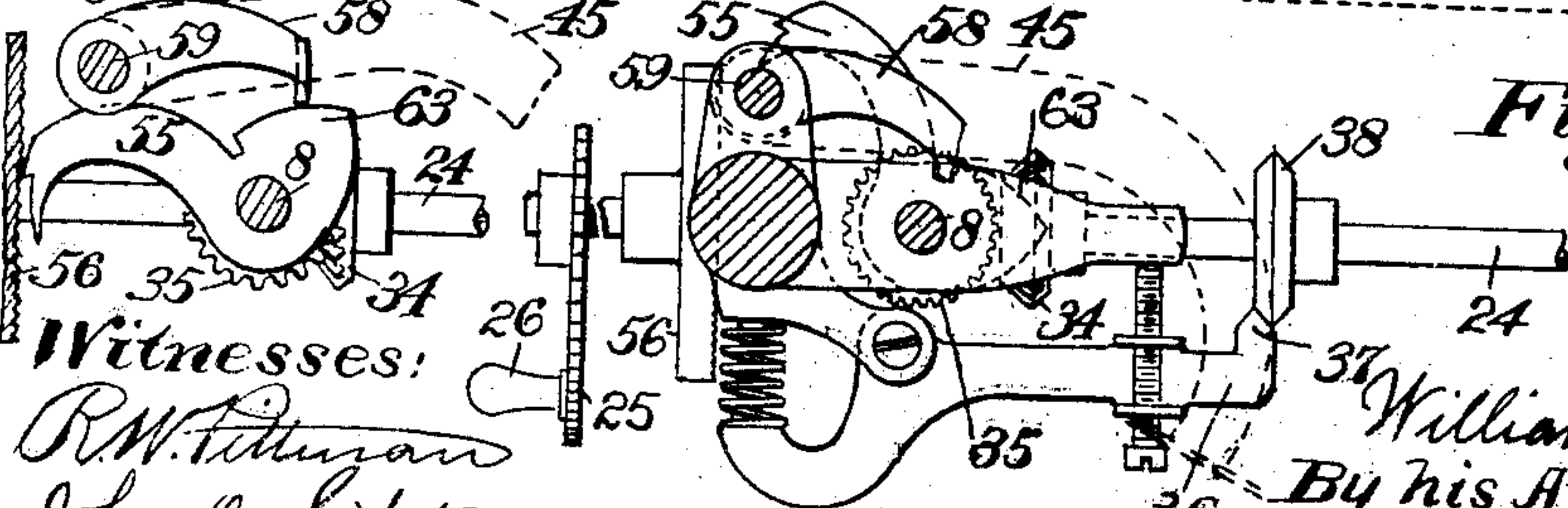


Fig. 7.

Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM F. HELMOND, OF HARTFORD, CONNECTICUT, ASSIGNOR TO UNDERWOOD TYPE-WRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

No. 931,303.

Specification of Letters Patent.

Patented Aug. 17, 1909.

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To all whom it may concern:

Be it known that I, WILLIAM F. HELMOND, a citizen of the United States, residing in Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to the ribbon mechanisms of typewriting machines, and particularly to those of the front strike variety in which the ribbon spools are mounted in cups in front of the platen, as in the well known Underwood type of writing machine.

It is usual to provide the cup with an opening through which to thread the ribbon, and in some machines, including said Underwood machine, this opening is inconvenient to get at, being beneath the front bar of the paper carriage, so that it is difficult to thread the ribbon after inserting the spool in the cup.

One of the objects of my invention is to overcome this difficulty, and to this end I swivel the cup, so that it may turn about the axis of the spool, to bring the cup into convenient position for threading the ribbon. I attach a finger-piece to the cup for convenience in turning the same, and I also employ a spring to return the cup to normal position.

Another object of the invention is to improve the automatic ribbon-reversing mechanism disclosed in Letters Patent 828,548, by making it practically impossible for the feed-reversing arms 22, of said patent, to become simultaneously engaged to the toothed-wheels 34. This object is accomplished by causing either arm, when it is being swung by its wheel, to put under tension the spring which controls the latch 47, so that said spring may subsequently swing the arm back away from the wheel.

Other objects and advantages will herein-after appear.

In the accompanying drawings, Figure 1 is a rear perspective elevation of the ribbon mechanism of an Underwood typewriting machine, showing my improvements applied thereto. Fig. 2 is a perspective view of a ribbon cup. Fig. 3 is a sectional elevation of a cup. Fig. 4 is a plan of the cup at the right hand side of the machine, showing in dotted lines the front carriage bar. Fig. 5 is a view similar to Fig. 4, but showing the

cup turned to bring it to position for conveniently threading the ribbon. Fig. 6 is a sectional plan to show the position of the parts when the feed-reversing arm at the left hand side of the machine is swung by its toothed-wheel to thrust the latter in axial direction. Fig. 7 is a sectional plan, showing the ribbon-reversing mechanism in normal position.

The ribbon 1 is carried upon spools 2, 3, and between said spools is threaded through a vibrating guide 4. The spools are inclosed in cups 5, 6, up through which extend vertical shafts 7, 8, on which the spools are detachably mounted. The usual function of the cups is to secure the coils of ribbon from dropping off the spools and becoming tangled up; and it will be understood that my improvements are applicable to other styles of cups or ribbon guards for this purpose.

The ribbon passes out through openings or guides 9, 10 formed in the sides of bodies 11, 12 of the cups, being carried from one cup through the vibrator 4 to the other cup. Upon the cups are provided flanged pulleys 13, 14 opposite the openings 9, 10 in the cups and close thereto, over which the ribbon runs and whereby it is guided, the flanges on the tops of said pulleys preventing the ribbon from riding up and off therefrom. Said pulleys are mounted on ears 15 formed in the bottoms of the cups. Said pulleys 13, 14 and openings 9, 10 normally lie beneath a front bar 16 of the usual Underwood paper-carriage where they are inaccessible to the operator. In the bottom of each cup is formed a circular opening or bearing 17 to fit upon a boss 18 secured upon the machine frame, to permit the cup to be rotated, whereby the pulleys and openings may be turned from the Fig. 4 position backwardly, and out from under the bar 16, as at Fig. 5; a shoulder screw 19 passing through a slot 20 in the bottom of the cup to limit the throw of the cup and also to hold the same down upon its seat.

The cups are provided respectively with finger pieces 21, 22, whereby they may be turned, and with springs 23 whereby they may be returned to normal positions.

As set forth in said patent, the ribbon may be wound by means of a horizontal shaft 24 having a ratchet wheel 25 and crank 26, the ratchet wheel driven by a pawl 27

carried by a crank 28 on a rock shaft 29, the latter connected by a crank 30 to an arm 31, which vibrates at all the key strokes. The shaft 24 is shiftable endwise to carry
 5 a gear 32 thereon into mesh with a gear 33 on the vertical shaft 7, and another gear 34 out of mesh with a gear 35 on the shaft 8, or vice versa; the position of the shaft being maintained by a spring arm 36 having
 10 a double beveled tooth 37 to engage a double beveled collar 38 fixed upon the shaft.

The automatic reversal of the ribbon is caused by obstructions 39 upon the ends of the ribbon, which are too large to pass
 15 through slots 40, 41 formed in the bent-up ends 42, 43, of a pair of swinging arms 44, 45, whereby the arms are swung in alternation to reverse the travel of the ribbon. The arm 44 is fixed upon a vertical shaft 46,
 20 which carries at its lower end a latch 47, normally engaging a notch 48 in the hub 49 of an idle arm 50, to prevent said arm from turning; a friction washer 51 working between the shaft 7 and the arm 50 or its hub
 25 49, to cause the arm constantly to tend to turn in the direction of the unwinding movement of the shaft 7, that is, in the direction to swing the arm 50 toward a wheel 52 fixed upon the shifting main shaft 24, and having
 30 crown teeth 53. As set forth in said patent, when the teeth 54 on the end of the arm 50 engage the teeth 53 on the wheel, the latter swings the arm about the axis 7, with the effect of forcing the wheel, together with the
 35 shaft 24, in axial direction, to engage the gear 32 with the gear 33 and disengage the gear 34 from the gear 35; whereupon the ribbon begins to wind upon the empty spool 2. When the spool 3 becomes empty, a similar
 40 operation is performed, an arm 55 engaging the wheel 56 also fixed upon the shaft 24, whereby the latter is returned to the position seen at Fig. 1.

It will be seen that the arm 55 turns about
 45 the spool shaft 8 with which it is frictionally connected by a washer 57, so that the arm 55 is caused constantly to tend to swing to the wheel 56; and that said tendency is restrained by a latch 58 on a shaft 59 carrying the arm 45. The shaft 59 is provided
 50 with a returning spring 60, and a similar spring 61 is coiled about the shaft 46.

In order to avoid the liability of the arms 50 and 55 becoming simultaneously locked
 55 to the wheels 52, 56, means are provided to swing said arms away from the wheels; the springs 60 and 61 being employed for this purpose. The hubs 49 of the arms 50, 55 are provided with cams or projections 62, 63,
 60 upon which the nose of the latches 47 and 58 ride while the arm 55 is being turned by the wheel 56, as at Fig. 6; said cam 63 swinging said latch in opposition to the tension of the spring 60. It will be understood
 65 that said spring now constantly tends to

swing the arm 58 back to normal position away from the wheel 56; and that as soon as the endwise movement of the shaft 24 is completed by the action of the spring-pressed arm 36 on the collar 38, the arm 55 will just
 70 clear the wheel 56, and will instantly swing back to normal position. The same provision of a cam 62 to be engaged by the latch 47 is made in the case of the arm 50; so that the liability is avoided of both arms ever
 75 becoming accidentally engaged to their wheels at the same time.

It will further be seen that during the movement of the arm 55 to the Fig. 6 position, the ribbon-guiding finger 43 is forced
 80 by the wheel 56 to travel in the direction of the ribbon, thus relieving the latter of longitudinal strain during the principal portion of the reversing operation.

It will be seen that the ribbon-guiding
 85 finger 42 on the latch-operating arm 44 is normally adjacent to the pulley 13, and is engaged by the latter during the rotation of the spool-cup to the Fig. 5 position, thus making it convenient to thread the ribbon
 90 through the slot 40 in said finger.

It will be seen that when the latch is released, there is practically no resistance to the movement of the arms 50 or 55 to the crown tooth wheel, and hence that the
 95 washer 51 or 57 may be very weak and offer no appreciable resistance to the turning of the spool shaft 7 or 8.

Variations may be resorted to within the scope of the invention, and portions of the
 100 improvements may be used without others.

Having thus described my invention, I claim:

1. In a typewriting machine, the combination with a pair of ribbon spools, of a
 105 pair of cups in which the spools are set, said cups having normally inaccessible guides for the ribbon, and mounted for displacement to bring the guides to accessible positions for conveniently threading the ribbon between
 110 the guides.

2. In a typewriting machine, the combination with a pair of ribbon spools, of a pair of cups in which the spools are set, said
 115 cups having normally inaccessible guides for the ribbon and mounted for displacement to bring the guides to accessible positions for conveniently threading the ribbon between the guides, and springs to return the cups to normal positions.
 120

3. In a typewriting machine, the combination with a pair of ribbon spools, of a pair of cups in which the spools are set, said
 125 cups having normally inaccessible guides for the ribbon and mounted for displacement to bring the guides to accessible positions for conveniently threading the ribbon between the guides, and finger-pieces upon the cups for displacing the same.

4. In a ribbon-reversing mechanism, the 130

combination with a latch and a ribbon-actuated latch-releasing arm, of a feed-reversing arm or device normally detained by said latch, and means effective after release of the latch for prolonging the movement of said ribbon-actuated arm in the direction of the travel of the ribbon to relieve the tension on the ribbon.

5. In a ribbon-reversing mechanism, the combination of a feed-reversing arm or device having a cam, means tending to operate said feed-reversing arm, a latch to detain said arm, a ribbon-actuated device to release the latch, and a returning spring for said latch, the latter constructed to be engaged by said arm and swung thereby against the tension of said spring during the feed-reversing operation, whereby said spring may operate to return said arm after the direction of feed is reversed.

6. In a ribbon-reversing mechanism, the combination with a revolving toothed wheel, of an arm, means to cause said arm to tend to swing to said wheel, a latch normally restraining said arm, a ribbon-actuated device having means to release the latch, and means rendered effective by the release of said arm and the engagement thereof with said wheel, to prolong the movement of the ribbon-actuated device in the direction of the travel of the ribbon, to release the tension on the ribbon.

7. In a ribbon winding mechanism the combination of a serrated wheel, means to rotate the same, an arm normally disengaged from said wheel, but engageable therewith to effect a reversal of the feed of the ribbon, means tending constantly to engage said arm with said wheel, a latch normally holding the arm away from the wheel, a device mounted to be moved by an obstruction on the ribbon to release said latch, means being connected to said arm to prolong the movement of said ribbon-moved device in the direction of the travel of the ribbon during the engagement of said arm with said wheel, and a spring to swing said arm away from said wheel and return said latch to normal position.

8. In a ribbon-reversing mechanism, the combination with an axially movable feed-reversing wheel, an arm, and means causing said arm to tend to engage said wheel, of a latch engaging a notched disk to restrain said arm, a movable member connected to said latch and having a part to be moved by an obstruction on the ribbon, and a spring to return said movable member and said latch to normal positions; said arm also movable by said wheel and cooperating therewith to effect a reversal of the ribbon feed, and a cam connected to said arm and engaged by said latch to enable said spring to swing said arm away from said wheel after the feed-reversing operation.

9. In a ribbon-reversing mechanism, the combination with a pair of ribbon-spool shafts, of a transverse driving-shaft movable into connection with either spool-shaft, wheels upon said driving-shaft, a pair of shifter-arms mounted loosely upon said spool-shafts, friction devices between said spool-shafts and said shifter-arms whereby the former may move the latter into engagement with said wheels, the latter being caused to ride upon said arms in a manner to shift said driving-shaft, a pair of rock-shafts, latches upon said rock-shafts and normally occupying notches in said shifter-arms, arms upon said rock-shafts and having portions in the path of the ribbon so as to be operated by the latter, said shifter-arms having cams to engage said latches and swing them during the movements of said shifter-arms effected by said wheels, and springs for said latches; said springs operating to swing the shifter-arms away from the wheels at the completion of the shaft-shifting movements of the latter.

10. In a ribbon-reversing mechanism, the combination with a pair of ribbon-spool shafts, of a transverse driving-shaft movable endwise into connection with either spool-shaft, toothed wheels fixed upon said driving-shaft, shifter-arms mounted loosely upon said spool-shaft and frictionally connected thereto so as to be movable thereby into engagement with said wheels, the latter by riding upon said shifter-arms being caused to effect endwise movements of said driving shaft, cams upon said shifter-arms, a pair of rock-shafts having latches to engage notches in said shifter-arms and to ride upon said cams, a pair of arms projecting from said rock shafts in position to be operated by obstructions placed upon the ribbon, and springs for returning said rock-shafts to normal positions, said springs operating to swing the shifter-arms away from the wheels.

11. In a typewriting machine, the combination of a ribbon spool, a cup in which the spool is set, said cup having an opening for the passage of a ribbon, and a ribbon-pulley mounted in an inaccessible position upon said cup, the latter mounted to turn to bring said opening and said pulley to accessible positions.

12. In a typewriting machine, the combination of a ribbon spool, a cup in which the spool is set, said cup having an opening for the passage of a ribbon, and a ribbon-pulley mounted in an inaccessible position upon said cup, the latter mounted to turn to bring said opening and said pulley to accessible positions; said pulley mounted close to said opening upon an ear which projects from the bottom of the cup.

13. In a typewriting machine, the combination with a pair of ribbon spools, of a

pair of cups in which the spools are set, said cups having inaccessible guides for the ribbon and mounted for lateral displacement to bring the guides to positions for conveniently threading the ribbon, and a ribbon-reversing mechanism including devices movable by the ribbon and having inaccessible openings through which the ribbon is threaded and mounted adjacent to said cups to be moved thereby to accessible positions.

14. In a typewriting machine, the combination of a ribbon spool, a cup in which the spool is set, said cup having an opening for

the passage of a ribbon, a ribbon-pulley mounted upon said cup, the latter mounted to turn to bring said opening and said pulley to accessible positions, and a ribbon-reversing mechanism including an arm movable by the ribbon and having an opening through which the ribbon is threaded, said arm mounted adjacent to said pulley to be moved by the cup to a position convenient for threading the ribbon therethrough.

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Witnesses:

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