J. C. DOANE.

TYPE WRITING MACHINE.

APPLICATION FILED JUNE 19, 1909.

934,431. Patented Sept. 21, 1909.

Fig 1.

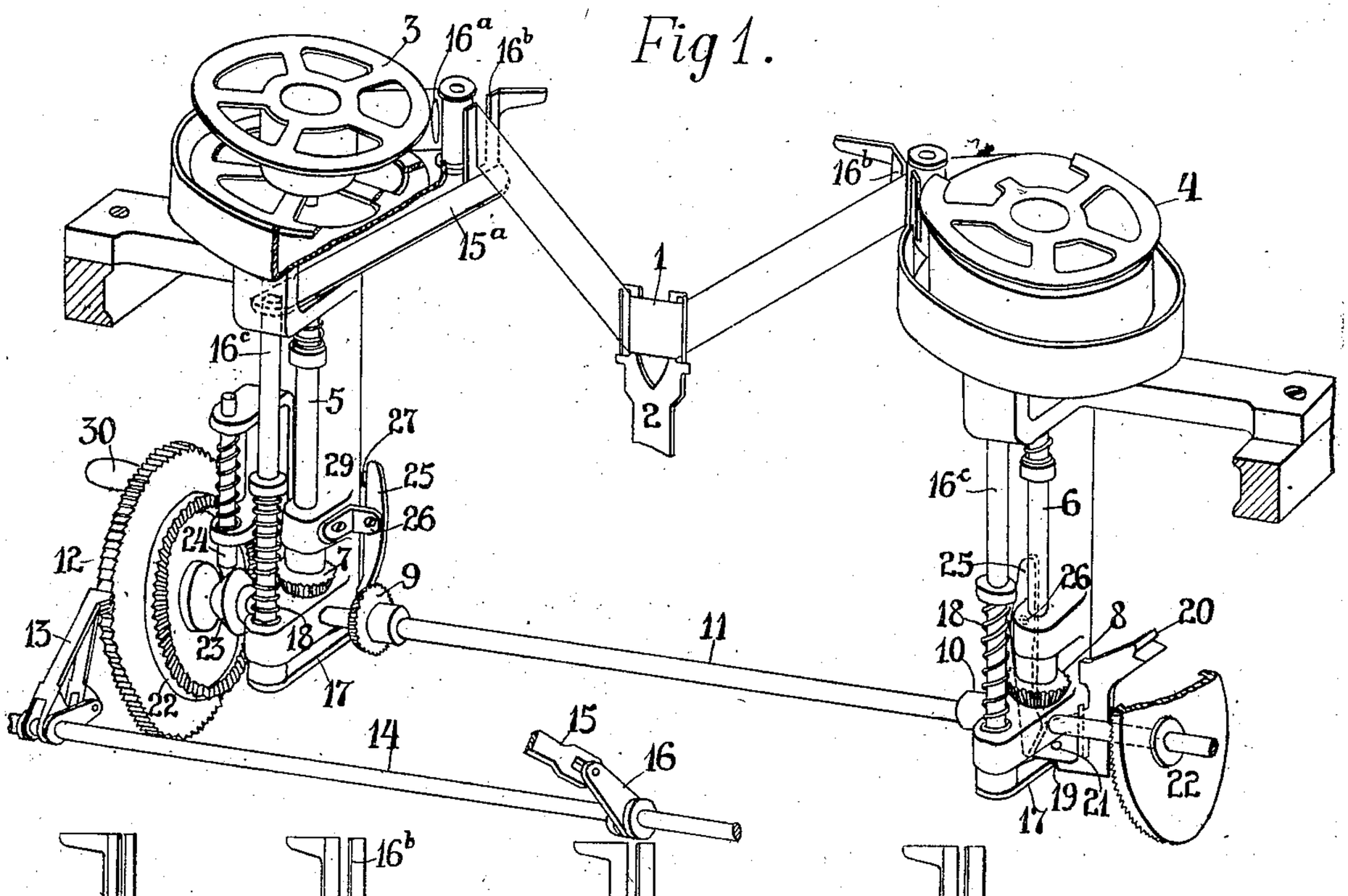


Fig.2

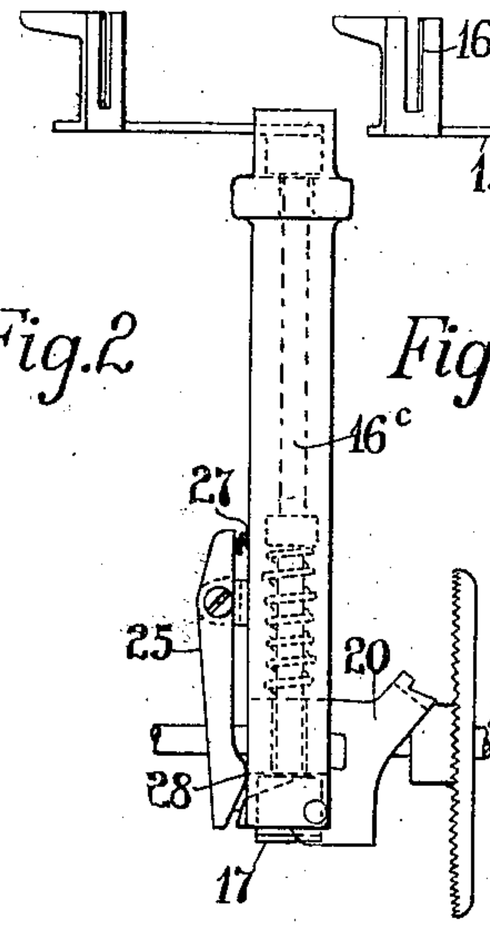


Fig.3

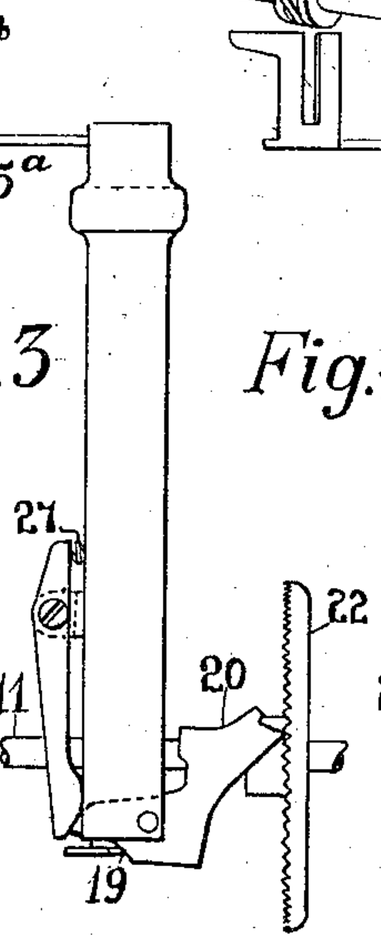


Fig.4

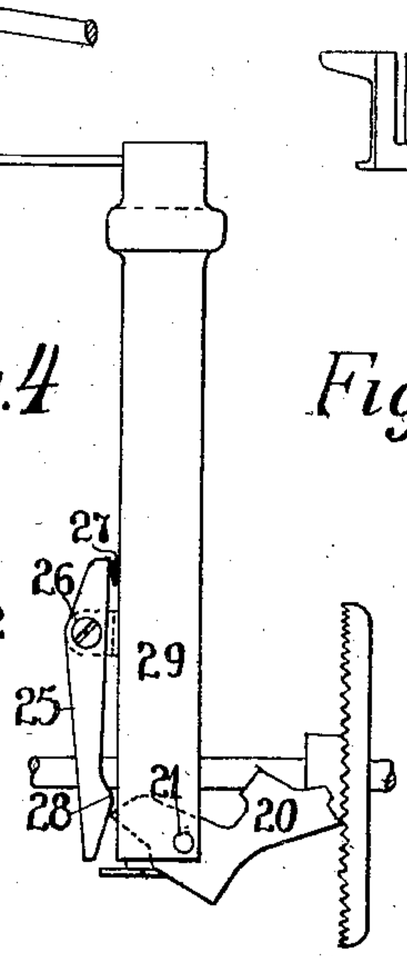
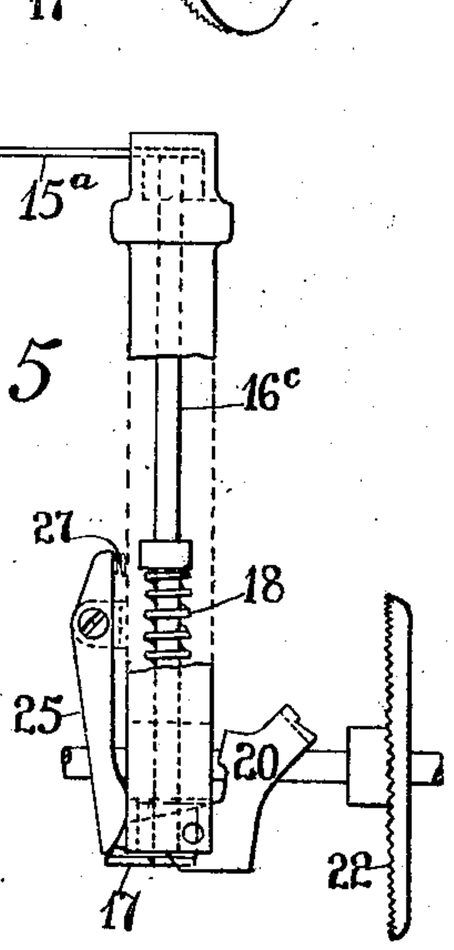


Fig.5



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UNITED STATES PATENT OFFICE.

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TYPE-WRITING MACHINE.

934,431. Specification of Letters Patent. Patented Sept. 21, 1909.

Application filed June 19, 1909. Serial No. 503,054.

To all whom it may concern:

Be it known that I, JOHN C. DOANE, 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 ribbon reversing mechanism, such for instance as illustrated in United States Patent No. 891,047 of June 16, 1908. In said patent are shown two vertical ribbon spool shafts, a transverse driving shaft, the latter endwise shiftable from one spool shaft to the other, and trip wheels mounted on said shaft, to move alternately into engagement with trips. The latter, however, are normally held away from the wheels by ribbon-controlled devices. When either ribbon is unwound from its spool its associated trip is permitted to fall into engagement with its trip wheel, and as the latter revolves there is effected an endwise shifting movement of the driving shaft, whereby the direction of the winding of the ribbon is reversed.

The object of the present invention is to provide means to avoid the liability of both trip wheels becoming simultaneously engaged with their trips and thereby locking the mechanism against action. To this end, I provide each trip with a spring device, which returns the trip after the disengagement of the latter from its trip wheel. The spring device does not return the trip entirely to normal position, but holds the trip so far away from the trip-wheel that there is no danger of accidental engagement and locking. The final portion of the return movement of each trip to normal position is effected by the ribbon-controlled device. When therefore the spool becomes empty, its trip is released and permitted to fall into engagement with the wheel independently of its spring-returning device. The revolving trip wheel thereupon swings the trip still farther in the same direction against the tension of said spring-returning device. This swinging action of the trip wheel in engagement with the revolving wheel causes the latter to travel in axial direction together with the main driving shaft, until the reversing of the ribbon-winding mechanism is effected. The returning spring for the other trip holds the latter away from its associated trip wheel, so that liability of both trips being simultaneously in engagement with their wheels is avoided.

In the accompanying drawings, Figure 1 is a rear perspective view of the ribbon-reversing mechanism of an Underwood front strike writing machine, embodying the present improvements. Fig. 2 is a front view of the tripping devices associated with the right hand ribbon spool, and showing the parts in normal positions. Fig. 3 is a view similar to Fig. 2, but showing the trip as having been permitted by the ribbon-controlled device to swing into engagement with the trip-wheel. Fig. 4 is a similar view showing the trip as having been forced farther around its pivot from the Fig. 3 position; this movement being accomplished by the trip wheel, which at the same time is forced in axial direction, to shift the transverse driving shaft from one spool to the other. This movement of the trip is effected against the tension of its returning spring. Fig. 5 is a view similar to Fig. 2, but showing the driving shaft as having shifted to reverse the winding of the ribbon, and the trip as having been moved back toward normal position in advance of the return of the ribbon-controlled device to normal position.

The types strike rearwardly through a ribbon 1, which is carried upon a vibrator 2 between spools 3, 4. Said spools are mounted on vertical shafts 5, 6 having pinions 7, 8, to mesh with pinions 9, 10 carried upon a horizontal shiftable transverse driving shaft 11, the latter having a ratchet wheel 12 and operated by a pawl 13, which is driven by a rock shaft 14 connected by arms 15, 16 to the usual vibrating universal bar mechanism (not shown).

Near each end of the ribbon is provided an obstruction 16^a, which is too large to go through an eye 16^b through which the ribbon is threaded. Continued winding of the ribbon therefore causes said obstruction to swing an arm 15^a upon which said eye 16^b is provided; said arm fixed upon a vertical rock shaft 16^c having at its lower end a forwardly extending arm 17. Said arm 17 is held in normal position by a spring 18 coiled about the shaft 16^c, and said arm is normally in engagement with a shoulder 19 provided on a trip 20, the latter pivoted at 21 upon the framework. The movement of the arm

15ª effected by the obstruction 16ª causes the arm 17 to swing from the Fig. 2 position away from the trip, as at Fig. 3, permitting the latter to fall into engagement with a crown-tooth trip wheel 22 which is fixed upon the driving shaft 11. Since the latter continues to turn, the tooth of the trip 20 is forced downwardly by the wheel 22 to the position at Fig. 4. Since said tooth swings outwardly as well as downwardly about the pivot 21, the wheel itself is forced in axial direction to the right from the position at Fig. 3 to the position at Fig. 4, taking with it the driving shaft 11 and a double beveled collar 23 thereon. A spring-pressed point 24 is forced up over and past the apex of the double bevel, and then re-acts to force the driving shaft 11 still farther toward the right, as at Fig. 5. At this final motion of the driving shaft, the trip wheel 22 springs away from the trip 20, and the latter is swung up nearly to normal position by a lever 25 pivoted at 26 upon the framework and operated by a compression spring 27. This return movement of the pawl is effected before the ribbon begins to rewind upon the empty spool. During such rewinding movement the obstruction 16ª is withdrawn from the eye 16ᵇ on the arm 15ª, and the spring 18 returns the rock shaft 16ᶜ and the parts thereon to normal positions; the arm 17 swinging from the position at Fig. 5 to that at Fig. 2, and again lifting the trip 20 the remaining distance to normal position.

It will be seen at Figs. 2, 3 and 5 that the spring 27 presses a stop 28 on the lever 25 against a fixed bracket 29 of the framework, so that said lever cannot oppose the gravitation of the trip from the position at Fig. 2 to that at Fig. 3, whereby the trip originally engages the trip wheel 22. It will be understood however that the inactive trip 20 cannot fall independently beyond the position indicated at Fig. 5, and hence cannot reach the inactive trip wheel; so that when the reversing mechanism is in operation at one side of the typewriting machine, it is impossible for the trip at the opposite side of the machine to fall accidentally into engagement with its trip wheel. This is of special advantage when the ribbon is being wound by hand, by means of the usual crank or handle 30, Fig. 1.

Having thus described my invention, I claim:

1. In a ribbon-reversing mechanism, the combination with spool shafts and a transverse shiftable driving shaft, the latter provided with alternately effective trip wheels, of trips to coöperate with said wheels to shift the driving shaft to and fro, and ribbon-controlled means to hold the trips away from the wheels; each trip provided with a device for returning it toward normal position after disengagement with the trip wheel and before the return of said ribbon-controlled device to normal position; means being provided to limit the action of said returning device, so that the return of the trip to normal position may be completed by said ribbon-controlled means; the latter having sufficient control over the trip to cause it to drop into engagement with its wheel at the ribbon-reversing operation, independently of said returning device.

2. In a ribbon-reversing mechanism, the combination with spool shafts and a transverse shiftable driving shaft, the latter provided with alternately effective trip wheels, of trips to coöperate with said wheels to shift the driving shaft to and fro, and ribbon-controlled means to hold the trips away from the wheels; each trip provided with a device for returning it toward normal position after disengagement with the trip wheel and before the return of said ribbon-controlled device to normal position; means being provided to limit the action of said returning device, so that the return of the trip to normal position may be completed by said ribbon-controlled means; the latter having sufficient control over the trip to cause it to drop into engagement with its wheel at the ribbon-reversing operation, independently of said returning device; said returning device comprising a lever having a spring and a stop.

3. In a ribbon-reversing mechanism, the combination with a shiftable ribbon-driving shaft having trip wheels thereon, of trips to coöperate with said wheels to shift said shaft to and fro, ribbon-controlled means to hold the trips normally away from the wheels; said ribbon-controlled means including devices called into operation when either spool becomes empty, for causing the trip associated with the empty spool to drop into engagement with its associated trip-wheel to effect the shifting of said driving shaft; means being provided to complete the shifting movement of the driving shaft independently of the trip; and means to return said trip toward normal position in advance of the return movement of said ribbon-controlled devices to normal positions.

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Witnesses:
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