April 24, 1934. E. T. HARNEY 1,955,912

TYPEWRITING MACHINE

Filed July 30, 1930

Fig. 1.

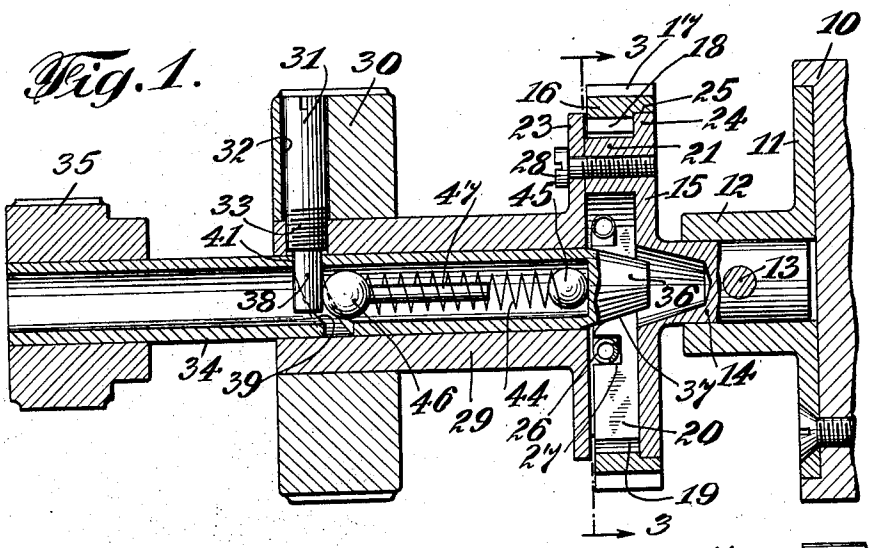


Fig. 2.

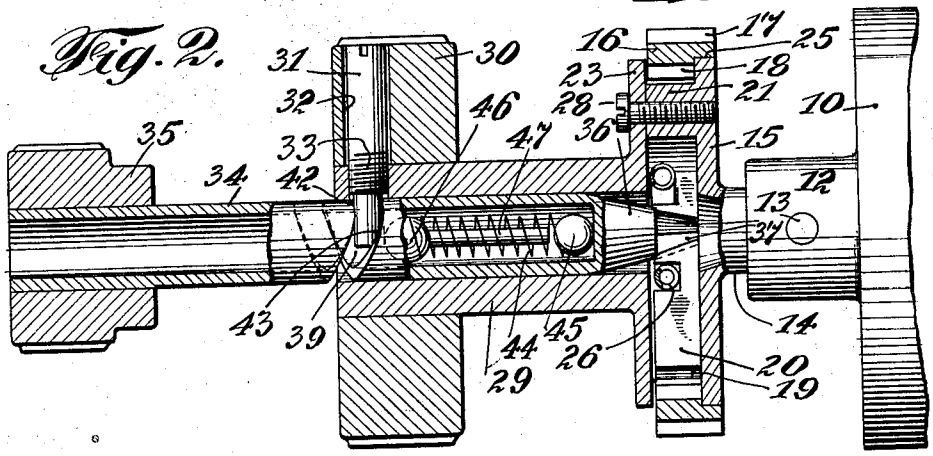


Fig. 3.

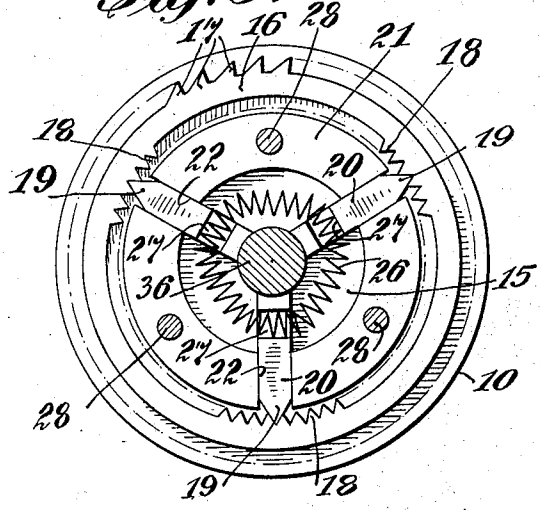
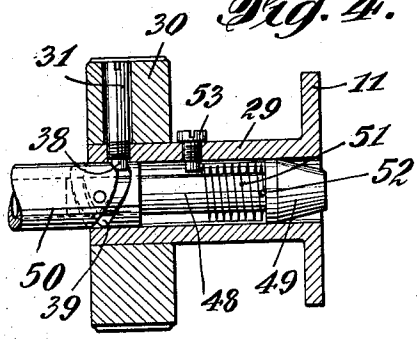


Fig. 4.



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UNITED STATES PATENT OFFICE

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TYPEWRITING MACHINE

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Application July 30, 1930, Serial No. 471,678

2 Claims. (Cl. 197—123)

This invention relates to typewriting machines, more particularly to line spacing mechanism therefor, and the invention has for its purpose and object the provision of an improved mechanism of this character designed especially for use in connection with the latest models of the "Remington" noiseless typewriter, although the invention is not necessarily confined to such particular make of machine and may be used in connection with any make of machine for which, as an attachment or otherwise, it may prove adaptable.

The invention has for its object the provision of a simple, inexpensive and efficient control by means of which, with one hand alone, to effect the operation of the clutch either for connecting the platen roller with, or disconnecting it from, the line space ratchet wheel.

According to my invention, by turning the operating knob a short distance in one direction, the clutch will automatically be released, thereby permitting the platen roller to be revolved freely and independently of the line space ratchet wheel, so that any desired fractional spacing can be accomplished between the usual spaced lines, or so that spacing may be effected at intervals different from the line spacing pre-determined by the toothed intervals of the ratchet wheel. On the other hand, by turning the operating knob reversely for a short distance, the clutch is permitted automatically to engage the line space ratchet wheel so that the platen roller will be locked to the ratchet wheel and consequently turn therewith for producing the usual line spaces in accordance with the ratchet wheel spacing.

An important feature of my invention resides in the fact that the control mechanism of my invention is so constructed that it can be operated by one hand. With the use of the device of my invention, there is no jarring endwise movement to move the platen roller or carriage longitudinally. Therefore, during the operation of the control mechanism, the second hand of the operator is not required to hold the platen roller or carriage against longitudinal shifting movement, but is entirely free for handling papers and erasers, or for performing other duties.

In the "Remington" noiseless machine, my simplified control mechanism replaces a large number of parts, expensive to manufacture and difficult to assemble. In said make of machine, there is a cylindrical axis having spaced longitudinal grooves in which are disposed small springs and cam bodies for cooperation with the clutch wedges in order to bring about the clutching and unclutching actions. There is also a special assembly of locking parts including a catch piece which must be operated when the platen roller is to be rotated independently of the ratchet wheel. All of these parts have been eliminated, and in their place I have provided a simple one-hand control consisting of few parts which are inexpensive to manufacture and can with ease and accuracy be quickly assembled in a few minutes.

A further improvement and advantageous feature consist in the provision of a control shaft or plunger having a conical end which operates between the clutch wedges in such manner that the latter will be uniformly and simultaneously moved into clutching engagement with the ratchet wheel. Moreover, the clutch wedges are operated smoothly and positively, as well as uniformly, so that there is no jarring, jamming or binding effect on the part of one or more of the wedges, as occurs so frequently where, as in the known assemblage, individual spring-urged cam bodies are provided for the several wedges.

Other objects and aspects of my invention will appear hereinafter.

The invention consists in the improved line spacing mechanism, and in the form, construction and relative arrangement of parts, as will be hereinafter described and subsequently defined in the subjoined claims.

Two simple and practical embodiments of the invention are illustrated in the accompanying drawing, forming a material part of this specification, and in which:

Figure 1 represents a longitudinal sectional view through line spacing mechanism embodying the present invention, the parts being shown in the relative positions they occupy when the wedges are in engagement with the teeth of the ratchet wheel;

Fig. 2 is a similar view, showing the parts as they appear when the wedges are out of engagement with the teeth of the ratchet wheel;

Fig. 3 is a cross section, taken on the line 3—3 of Fig. 1; and

Fig. 4 is a longitudinal sectional view on a smaller scale, showing an alternative form of the construction.

With more particular reference to Figs. 1 to 3, inclusive, wherein I have illustrated a preferred embodiment of my invention, the standardized parts of the "Remington" noiseless typewriting machine include a platen roller 10, and end piece 11 which is secured thereto and which has a hollow projecting cylindrical boss 12. Secured within said boss 12 by means of a rivet 13 or otherwise is an axis member 14 for the platen roller.

15 designates a clutch housing or section with which the axis member 14 is herein represented as made integral. Loosely surrounding the clutch housing 15 is a ratchet wheel or ring 16 having the usual exterior line spacing teeth 17 with which a line spacing roll (not shown) cooperates in the usual way.

The ratchet wheel or ring 16 is provided with internal teeth 18 for receiving the pointed or wedge-shaped ends 19 of the radially disposed wedges 20. Formed with the clutch housing is a ring portion 21 having radial channels 22 wherein the wedges have sliding movement for effecting engagement with and disengagement from the internal teeth 17. The ratchet wheel or ring 16 is held in place for relative rotation between a front disk 23 and an annular flange 24 provided on the clutch housing. Preferably, and as shown, the ratchet wheel is provided with an interior annular recess 25 for receiving therein the annular flange 24.

As best shown in Fig. 3, the wedges 20 are normally drawn inwardly towards the center of the clutch housing by means of an endless coil spring 26 which is seated in suitable openings or notches 27 provided in the wedges near the inner ends thereof. The disk member 23 fits flat against the ring portion 21 and is secured in place thereagainst by means of screw bolts 28, which are passed through the disk and are threaded into said ring portion 21. This disk maintains the radially arranged wedges 20 and the endless coil spring 26 operatively in position within the clutch housing.

29 designates an outer tubular member with which, in the present instance, the disk 23 is represented as made integral. A suitable hand wheel 30 surrounds the tubular member 29 at the outer end thereof, and in the present instance a screw pin 31 is arranged to secure the hand wheel 30 to said tubular member, said screw pin being inserted in a suitable bore 32 in the hand wheel and being threaded at 33 to the tubular member 29.

An inner tubular member 34, which has the function of a plunger, is mounted within the outer member 29 so as to have sliding and turning fit therein. This plunger is of greater length than the member 29 and is provided at its outer end with an operating knob 35. At its inner end, the plunger is formed with a conical head 36 adapted to engage between the inner ends of the wedges 20, which inner ends are sloped or beveled as at 37 in substantial conformity with the slope of the conically shaped head. The screw pin 31 has a reduced portion 38 which extends through a curving cam slot 39 provided in the plunger 34. At its opposite ends the cam slot is formed respectively with dwell portions 41 and 42. One side of the reduced end of the pin is somewhat curved at 43 where it engages the curving side wall which defines the cam slot. Within the interior of the hollow plunger is an expansion coil spring 44. Interposed between the inner end of this spring and the conical head 36 is a ball 45 and at the opposite end of the spring is a ball 46 which is held in abutment against the reduced portion of the screw pin. The ball 46 carries a guide pin 47 which extends along the axial center of the coil spring as shown. The expansion spring is thus preferably mounted within the plunger between the plunger head 36 and the reduced end of the screw pin. It is mounted so as to be normally under tension and to tend to urge the plunger in a direction for engaging the conical head 36 between the inner ends of the wedges.

When, under this arrangement, the operating knob 35 is turned in a direction for engaging the reduced end 38 of the screw pin in the dwell 41, as shown in Fig. 1, the plunger will be turned and advanced inwardly so as to press its conical end between the inner tapering ends of the wedges with the result that the wedges will be forced radially outwardly and into engagement with the internal teeth of the ratchet wheel or ring 16. By this operation, the platen roller is connected with the ratchet wheel or ring so as to turn therewith for effecting line spacing in accordance with the intervals of the exterior ratchet teeth 17. Owing to the tension of the expansion coil spring, exerted between the conical head 36 and the reduced end of the screw pin, the latter is held firmly in the dwell portion 41 so as to prevent any accidental relative turning of the plunger during the operation of the platen roller under the turning movement imparted to it by turning the hand wheel 30. When it is desired to operate the platen roller independently of the ratchet wheel or ring 16, the operating knob 35 is turned reversely, that is to say, in a direction to bring the dwell portion 42 into engagement with the reduced end 38 of the pin. By such reversing operation, an outwardly advancing movement of the plunger is effected so that its conical end 36 will be withdrawn from between the wedges 20, with the result that said wedges will be drawn inwardly sufficiently by the endless coil spring to effect disengagement of the wedge shaped outer ends 19 from the internal teeth 17. When the plunger is turned into that position in which the dwell portion 42 is engaged with the pin part 38, it will be maintained in that position because of the frictional engagement induced by the expansion spring 44. With the wedge parts disengaged from the internal teeth of the ratchet wheel, the platen roller through the operation of the hand wheel 30 can be turned freely so as to effect fractional line spacing at intervals different from the line spacing pre-determined by the toothed intervals of the ratchet wheel.

In the alternative form of construction illustrated in Fig. 4, the plunger instead of being made hollow for housing the expansion spring, is made with a reduced portion 48 between the conical head 49 and the cam slot portion 50. Mounted around the reduced portion 48 within the tubular member 29 is a coil expansion spring 51 one end of which is secured to the reduced portion at 52, while the other end abuts against the inner end of a screw pin 53 which is threaded through the wall of the tubular member 29 as shown. This expansion spring is thus mounted so as to be always under tension, irrespective of whether the plunger occupies its inner position for maintaining the wedges in engagement with the internal teeth of the ratchet wheel, or whether it is in its outer position in which the wedges are withdrawn from engagement with the ratchet wheel. Manifestly, this provision is necessary in order to furnish the force for maintaining the plunger against accidental displacement at the times when either of the dwell portions 41 or 42 are in engagement with the reduced end 38 of the screw pin 31. This alternative form of construction functions in all respects like the construction illustrated in Figs. 1 and 2. However, by mounting the expansion spring around the reduced portion of the plunger instead of within the hollow interior thereof, the length of the

outer tubular member 29 may be considerably shortened and a more compact device thereby provided for attachment to the end of the platen roller. It is, of course, desirable to provide at the end of the platen roller a construction that is not too extensive in length.

From the foregoing description, taken in connection with the accompanying drawing, it will be manifest that I have disclosed an extremely simple and thoroughly satisfactory form of variable line spacing mechanism which embodies the features which I have enumerated in the statement of invention and as well in the foregoing description; and while I have, in the present instance, shown and described two simple embodiments thereof as reduced to practice, it is to be understood that the constructions illustrated are susceptible of modification in various particulars without departing from the spirit or scope of my invention or sacrificing any of its advantages.

I claim:—

1. In line spacing mechanism for a typewriting machine including a platen and clutch mechanism of the type embodying a plurality of radially-arranged spring-withdrawn wedges with inner camming ends and an internally toothed ratchet surrounding the wedges for engagement by the outer ends thereof whereby to close the clutch, a sleeve rigidly secured at one end to the ratchet and aligned axially with the center point for the wedges, a cylindrical operating member movably disposed within the sleeve and having an integrally connected inner conical end engageable with and between the camming ends of the wedges to provide for actuating the wedges to close the clutch and for the spring-withdrawal of the wedges to open the clutch, according to the position of the member, a finger piece fixed to the outer end of the member for the actuation of the member to and from clutch-closing position, means between the sleeve and member so arranged as to automatically force the member, when actuated to and from clutch-closing position, to be actuated with a positive screw feed motion for operating the said conical end against the camming ends of the wedges by screw feed motion whereby through such motion to avoid any jarring or jamming which will result in longitudinal shifting of the platen when operating the clutch, and mechanical means for automatically retaining the member both in clutch-open position and in clutch-closing position.

2. In line spacing mechanism for a typewriting machine including a platen and clutch mechanism of the type embodying a plurality of radially-arranged spring-withdrawn wedges with inner camming edges and an interiorly toothed ratchet surrounding the wedges for engagement by the outer ends thereof whereby to close the clutch, a sleeve rigid with the ratchet and having axial alignment with the center point for the wedges, a cylindrical operating member movably disposed within the sleeve and having an integrally connected inner conical end engageable with and between the wedge camming ends to provide for actuating the wedges and closing the clutch and for the spring-withdrawal of the wedges to open the clutch, according to the position of said member, means fixed to the member for actuating the same to and from clutch-closing position, a groove spirally cut in the periphery of the member and a pin fixed in the sleeve engaging in the groove so that the member, on the actuation thereof either to or from clutch-closing position, will be given a screw feed motion whereby under such motion to engage the conical end with the wedge camming edges, and resilient means acting on said member to maintain at all times a frictional bearing engagement between the groove wall and the pin to retain the member against its screw feed motion until it is positively actuated by the operator of the machine.

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