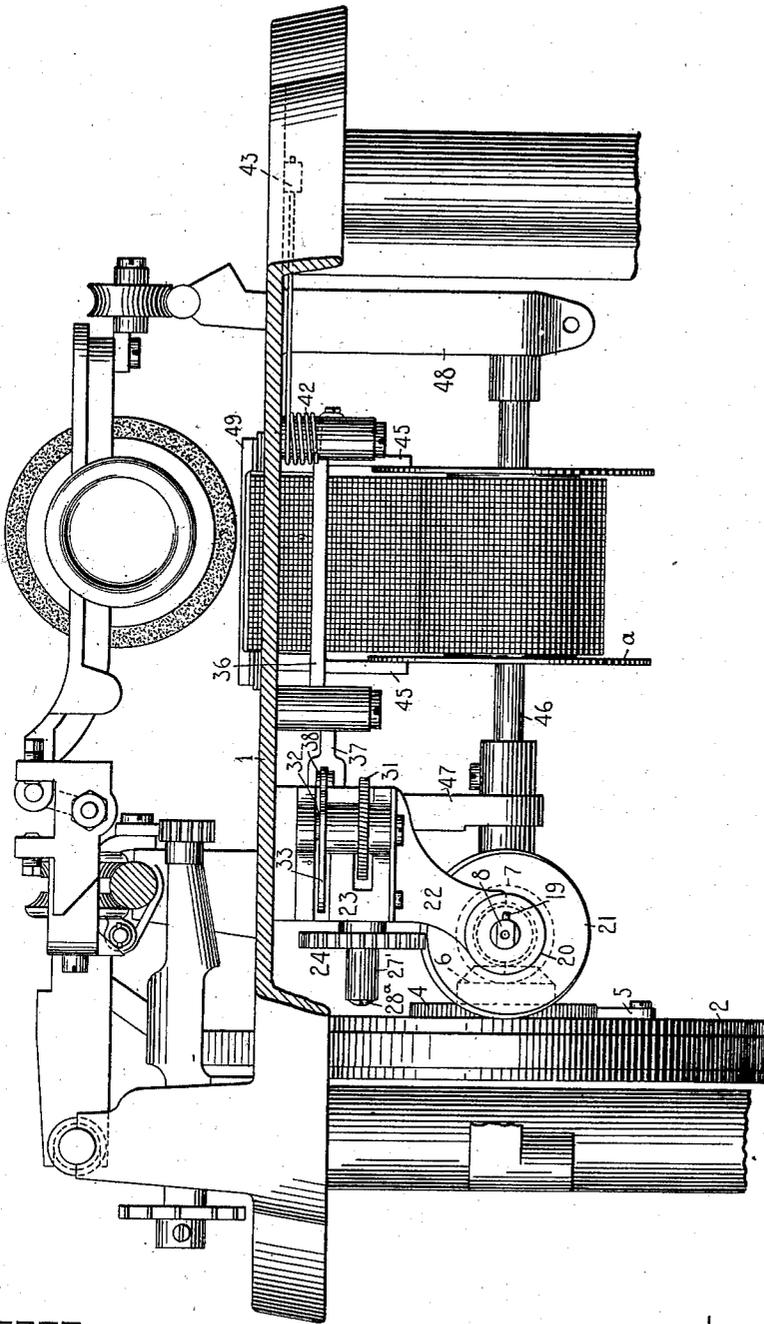


C. H. SHEPARD.  
TYPE WRITING MACHINE.  
APPLICATION FILED OCT. 30, 1902.

3 SHEETS—SHEET 1.

Fig. 1.



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*K. V. Donovan,*  
*Charles Smith*

INVENTOR:

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HIS ATTORNEY

No. 748,111.

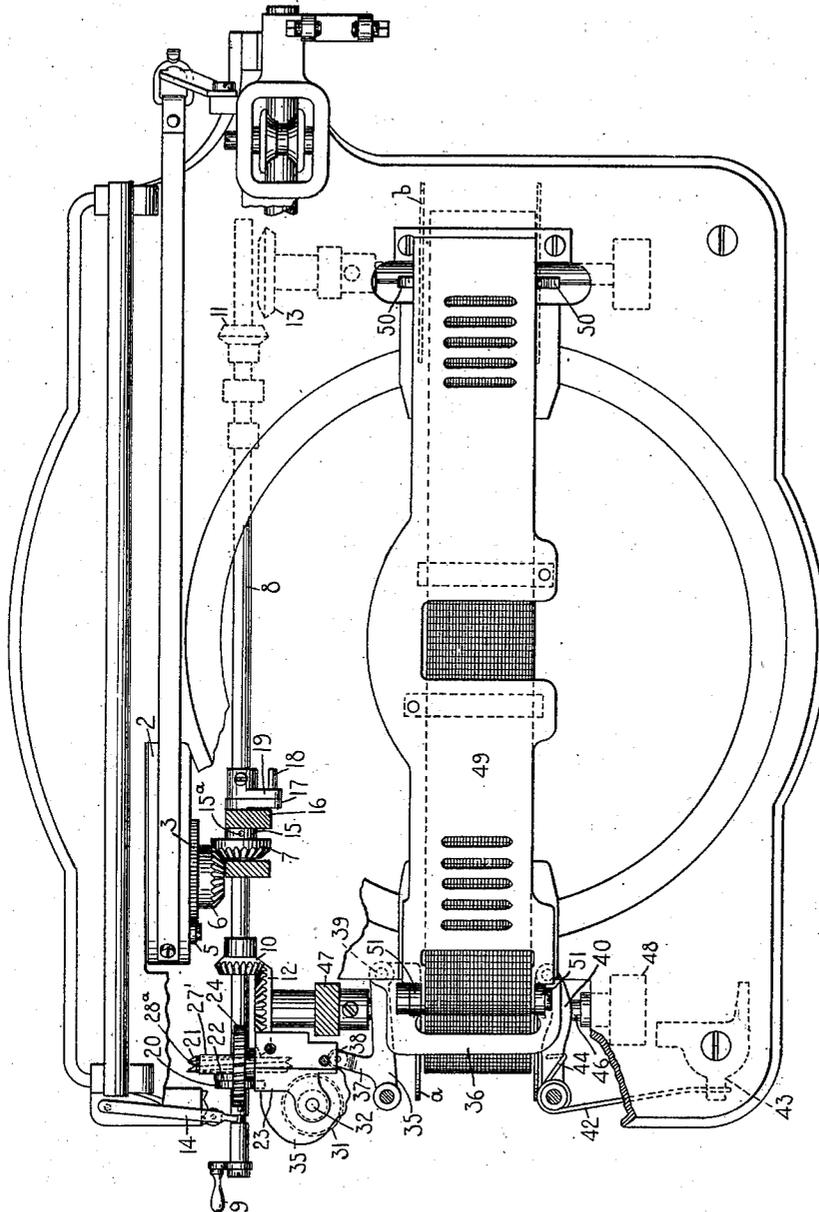
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NO MODEL.

3 SHEETS—SHEET 2.

FIG. 2.



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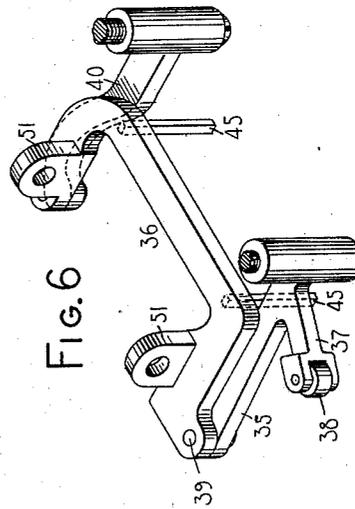
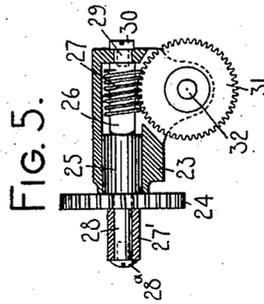
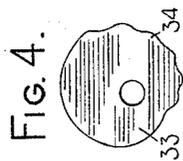
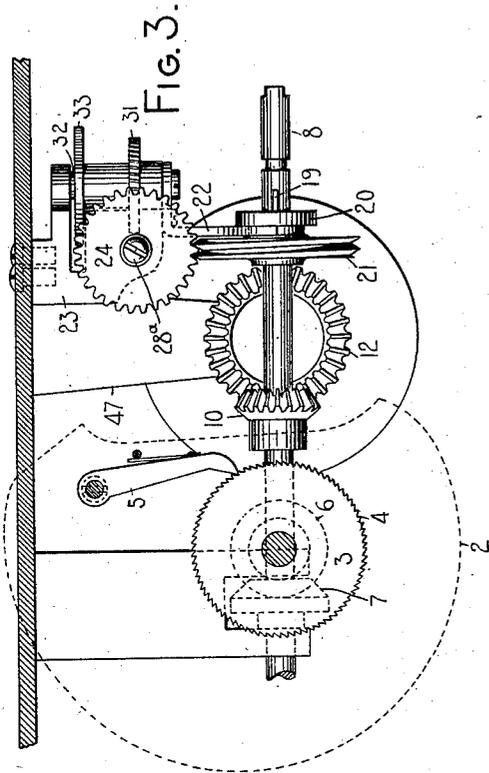
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C. H. SHEPARD.  
TYPE WRITING MACHINE.  
APPLICATION FILED OCT. 30, 1902.

NO MODEL.

3 SHEETS—SHEET 3.



WITNESSES:

*K. V. Donovan,*  
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INVENTOR:

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# UNITED STATES PATENT OFFICE.

CHARLES H. SHEPARD, OF NEW YORK, N. Y., ASSIGNOR TO WYCKOFF, SEAMANS & BENEDICT, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 748,111, dated December 29, 1903.

Application filed October 30, 1902. Serial No. 129,423. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. SHEPARD, a citizen of the United States, and a resident of the borough of Brooklyn, city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to certain improvements in the ribbon mechanism for type-writing machines, and more particularly to that class of ribbon mechanisms wherein the ribbon receives a crosswise movement as well as a movement in the direction of its length—such as is illustrated, for instance, in the patent of L. P. Diss, No. 599,417, dated February 22, 1898.

The object of the invention is to provide a simple and efficient mechanism of the character specified and to render the operation of the mechanism more positive and reliable than heretofore.

To the above ends my invention consists in the novel features of construction, arrangements of parts, and combinations of devices hereinafter described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is an elevation of the upper left-hand side of a type-writing machine with the frame partly broken away to more clearly show my improvements. Fig. 2 is a plan view of the same with certain parts omitted. Fig. 3 is a detail end view of certain of the parts illustrated in Figs. 1 and 2. Fig. 4 is a detail plan view of the actuating-cam. Fig. 5 is a detail sectional view of the worm and gears which operate the cam, together with the bracket which supports them. Fig. 6 is a perspective view of the frame at the left-hand side of the machine that shifts the ribbon-spools, together with its supports and shifting device.

The same reference character will be found in the various figures designating the same part.

The frame 1 of the type-writing machine is of the usual construction, and the machine is of that class which is provided with a carriage that is moved forward or in the direction of its feed by a band or strap passing around a drum 2, containing a coiled spring

under tension. Loosely mounted on the shaft 3 of this drum is a ratchet-wheel 4, which is driven in one direction by the pawl 5, but is free from movement when the drum revolves in an opposite direction to permit the return of the carriage to the right, while the ratchet-wheel remains at rest. This is in order that the ribbon mechanism, which is controlled by the ratchet-wheel, may remain at rest during the return movement of the carriage. Attached to or integral with the ratchet is a bevel-gear 6, meshing with a similar gear 7, carried by a shaft 8, but permitting the shaft to slide independently thereof in a longitudinal direction. This shaft 8 extends from side to side of the machine at its rear portion thereof and is supported by suitable brackets. The shaft is provided at one end with a handle 9 for turning it or to effect a longitudinal movement thereof when desired and has bevel-gears 10 and 11, either of which is adapted to mesh with its associated bevel-gear 12 or 13, mounted on the shafts which carry the left and right hand ribbon-spools *a* and *b*, respectively. The gears 10 and 12 for the left-hand spool are shown in Fig. 2 as engaged and held in mesh by a locking device 14.

The bevel-gear 7 is mounted on one end of a sleeve 15, which is seated on a second sleeve (not shown) and is secured thereto by a set-screw 15<sup>a</sup>. This second sleeve is loosely mounted on the shaft 8 and has its bearing in the bracket 16 and projects to the right thereof, where it is provided with a crank-arm 17, carrying a pin 18, which passes loosely through a slot in the end of a crank-arm 19, secured to the shaft 8. The shaft 8 near its left-hand end (see Fig. 3) is provided with a spline 19<sup>a</sup>, which plays through the sleeve 20, and a worm 21, retained at this point by the forked arm 22 of the bracket 23 and which takes in an annular groove in the sleeve. The construction, therefore, is such that a longitudinal movement of the shaft 8 may be effected, though the shaft is at all times adapted to turn the worm when the shaft is rotated, whether it be rotated by the drum 2 through the intermediate gearing or by the handle 9.

The worm 21 engages a worm-wheel 24,

which is connected to an elongated hub 25, journaled in the bracket 23 and having an integral shaft 26 with a worm 27, as shown in Fig. 5. The hub is reduced at 28 to form a bearing for the worm-wheel 24, and the outer portion of the part 28 is encircled by a sleeve 27', which is clamped against the side of the worm-wheel 24 by the head of a small screw 28<sup>a</sup>. The end of the shaft 26 is reduced at 29, where it is received within an opening in the bracket and acts as a journal for the shaft, and received within a threaded opening in the end of the reduced portion is the stem of a headed screw 30, the head of the screw 30 serving to retain the shaft and the connected parts in place within the bracket. The worm 27 engages a worm-wheel 31, carried by a shaft 32, mounted vertically in a bearing in the bracket 23. This shaft 32 carries at its upper end the cam 33, which is shown in Fig. 4 and where it will be seen that about one-half of the face of this cam is a parabola, the balance being made up of a series of steps 34, which impart a shifting motion to the bell-crank lever 35. The lever 35 is one of two supports pivoted to the under side of the top plate of the frame of the machine and carrying the spool-shifting frame 36. As shown in Fig. 6, the lever 35 has its member 37 forked and provided with a roller 38, which rides over the face of the cam 33. The outer end of the other member of the lever 35 is pivoted to the frame 36 at 39, while the other supporting-arm, 40, is also pivoted at its outer end to the frame. Any movement, therefore, of the member 37 will tend to move the frame 36 fore and aft of the machine and to effect a sidewise or transverse movement of the ribbon, and this, with the longitudinal feed of the ribbon from one spool to another, causes the entire surface of the ribbon to be presented to the action or impact of the types. The pressure of a spring 42 tends to throw the frame in the opposite direction from that in which it is positively moved by the cam and keeps the roller 38 upon the face of the cam 33. This spring 42 has one of its ends held in an adjustable block 43 and after encircling the pivotal end of arm 40 exerts a pressure with the other end 44 upon the arm.

The frame 36 has on its upper face two ears 51 51, which carry a guide-pin, over which the ribbon passes in its movement from one spool to the other. Depending from the under surface are two fingers 45 45, which span the spool *a* and carry it along the shaft 46 with each movement of the bell-crank lever 35. The shaft 46 is of usual construction and is provided with a spline, which is not shown. It is revolved by the bevel-gear 12, carrying the spool *a* with it, and is journaled in brackets 47 48. Attached to the frame 36 is the ribbon-guide plate 49, of usual construction, and which has at its right-hand end two depending fingers 50 50, which shift the spool *b* at this end of the machine in unison with

the spool *a*. This frame can be removed or swung up on its pivot, which is formed by the guide-pin carried in the ears 51 51 on the upper side of the frame 36.

It will readily be seen that when the shaft 8 revolves through the agency of the bevel-gears 6 and 7 the worm 21 is put in motion, slowly turning the worm-wheel 24. The worm 27 on the shaft 25 on this wheel 24 likewise causes the worm-wheel 31 to revolve, carrying with it the cam 33, the face of which acting upon the roller 38 and lever 35 effects a transverse movement of ribbon back and forward across the printing-center while the winding action continues, so that the ribbon receives an intermittent crosswise and longitudinal feed. Each intermittent movement being very slight, eventually, as the ribbon passes from spool to spool, causes every portion of the width of the ribbon to be presented to the face of the type and effects the utilization of the entire ribbon and prevents undue wear or use along any certain line of its length. The use of worms and worm-gears or toothed gearing instead of pawl-and-ratchet mechanism heretofore employed positively assures change of position of the ribbon at each printing operation, which in turn assures uniform characters of imprint throughout the writing.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a type-writing machine, the combination of a spring-drum, ribbon-spools, a rotating and longitudinally-movable shaft that is rotated by said spring-drum and is adapted to rotate said ribbon-spools, and toothed gears that are rotated by the shaft and afford a transverse movement of the ribbon.

2. In a type-writing machine, the combination of a rotating and longitudinally-movable shaft, ribbon-spools, gears on said shaft, and cooperating toothed gears that are rotated by the gears on the shaft to turn the ribbon-spools and to effect a transverse movement of the ribbon.

3. In a type-writing machine, the combination of a spring-drum, a toothed gear, pawl-and-ratchet mechanism intermediate of said gear and spring-drum, a cam that effects the transverse movement of the ribbon, and intermediate connections between said gear and cam, said connections consisting wholly of toothed gearing controlled by said first-mentioned toothed gear.

4. In a type-writing machine, the combination of ribbon-spools, a rotating and longitudinally-movable shaft that is adapted to rotate said ribbon-spools, a worm-wheel on said shaft, and worm-gears to which motion is transmitted by said worm and which transmits a transverse movement to the ribbon.

5. In a type-writing machine, the combination of ribbon-spools, a spring-drum, a longitudinally-movable and rotating shaft that is rotated by said spring-drum and rotates the ribbon-spools, a worm-wheel splined upon said

shaft, and worm-gears that are actuated by said worm-wheel and control the transverse feed of the ribbon.

5 6. In a type-writing machine, the combination of ribbon-spools, a spring-drum, a gear that is moved in one direction by said drum, a rotating and longitudinally-movable shaft that is turned by said gear, gears on said shaft and cooperating gears that are turned  
10 by the gears on the shaft and are effective to rotate either spool positively depending on the longitudinal disposition of the shaft, and to transmit a transverse movement to the ribbon.

15 7. In a type-writing machine, the combination of a carriage, a driving-drum, a pawl-and-ratchet mechanism actuated thereby, a shaft driven by said pawl-and-ratchet mechanism and having a spline, a worm carried  
20 by said shaft and held against the longitudinal shifting of the shaft, a cam operated by the worm through the intermediate gearing, ribbon-spools, a frame adapted to laterally shift the ribbon-spools, supports for carrying  
25 said frame, one support being provided with a roller and actuated by the cam, and a spring for forcing the roller against the face of the cam.

30 8. In a type-writing machine, the combination of a carriage-driving drum, a longitudinally-shifting shaft revolved by the drum through intermediate gearing, ribbon-spools, bevel-gears carried by the shaft for driving the ribbon-spools, a worm revolving with the  
35 shaft but held against the longitudinal movement of the shaft, a spool-shifting frame adapted to shift laterally, and intermediate gearing to effect said lateral movement by means of the worm and shaft.

40 9. In a type-writing machine, the combination of a longitudinally-shifting shaft provided with bevel-gears and adapted to turn the ribbon-spools, a spline on the shaft, a worm carried by said shaft and having a

sleeve through which the shaft and spline 45 are designed to shift, a bracket adapted to engage the sleeve of the worm and hold it against the shifting motion of the shaft, a worm-wheel, a second worm carried on the shaft of said worm-wheel, a second worm-  
50 wheel actuated by the second worm, a cam carried on the shaft of the second worm-wheel, a spool-shifting frame, and supports having a lateral movement given by the cam.

55 10. In a type-writing machine, the combination of a shaft operating the ribbon-spools and adapted to shift longitudinally, a worm adapted to rotate with the shaft but permitting the longitudinal passage of the shaft independently thereof, and ribbon-carrying  
60 spools adapted to receive a lateral motion while revolving by means of the said worm through intermediate gearing.

65 11. In a type-writing machine, the combination of inking-ribbon spools adapted to move in unison, a ribbon-guide plate, a spool-shifting frame, supports therefor, one being a bell-crank lever and carrying a roller in one of its members, a shaft driven by the carriage-driving drum and adapted to revolve  
70 the ribbon-spools alternately, a worm mounted on the shaft and permitting the longitudinal movement of the same through its sleeve, a worm-wheel meshing with said worm, a second worm actuated by this worm-  
75 wheel, a second worm-wheel, a cam carried on the shaft of the second worm-wheel and having half of its face stepped and bearing against the roller of the shifting-frame support to give the shifting frame a lateral movement. 80

Signed in the borough of Manhattan, city of New York, in the county of New York and State of New York, this 29th day of October, A. D. 1902.

CHARLES H. SHEPARD.

Witnesses:

K. V. DONOVAN,  
E. M. WELLS.