F. H. WARD.

LINE SPACING MECHANISM FOR TYPE WRITERS.

APPLICATION FILED NOV. 27, 1906.

924,021.

Patented June 8, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

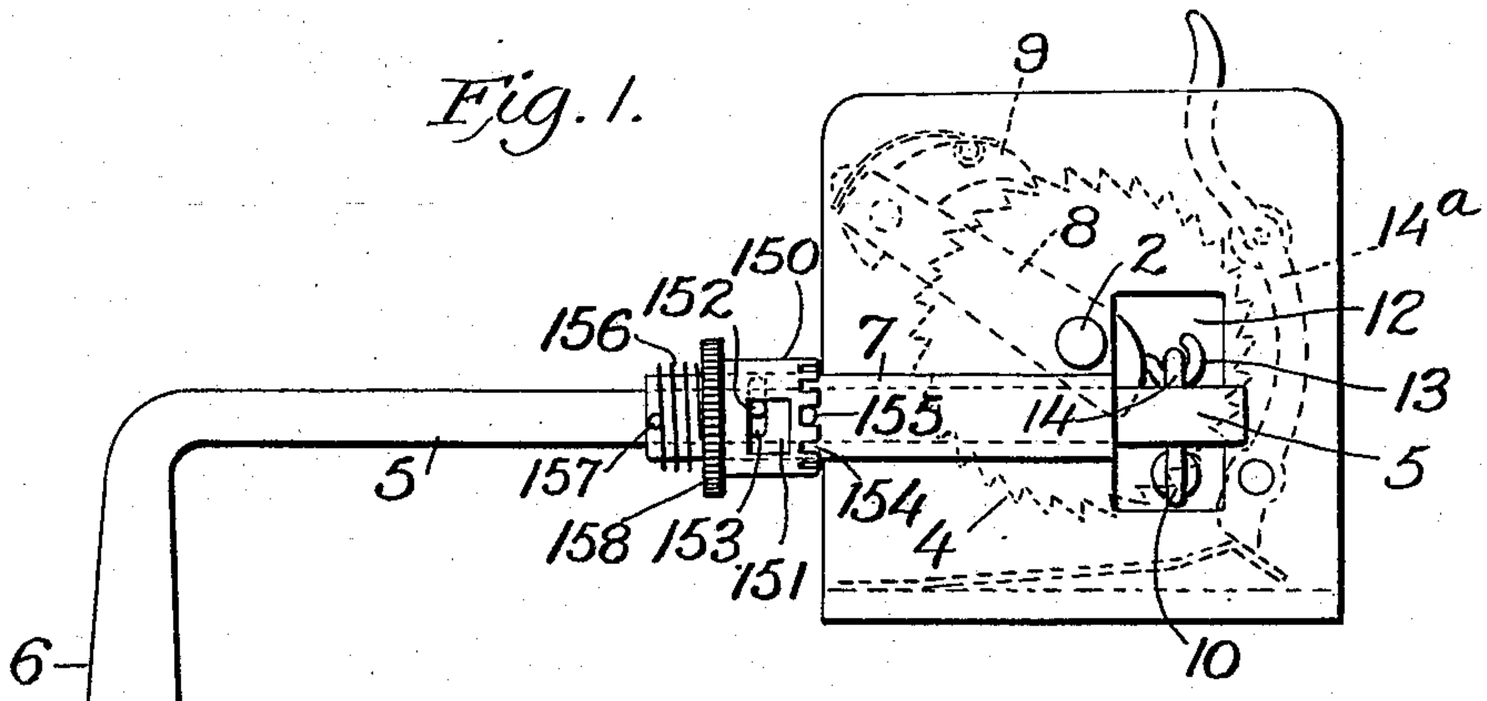

Fig. 2.

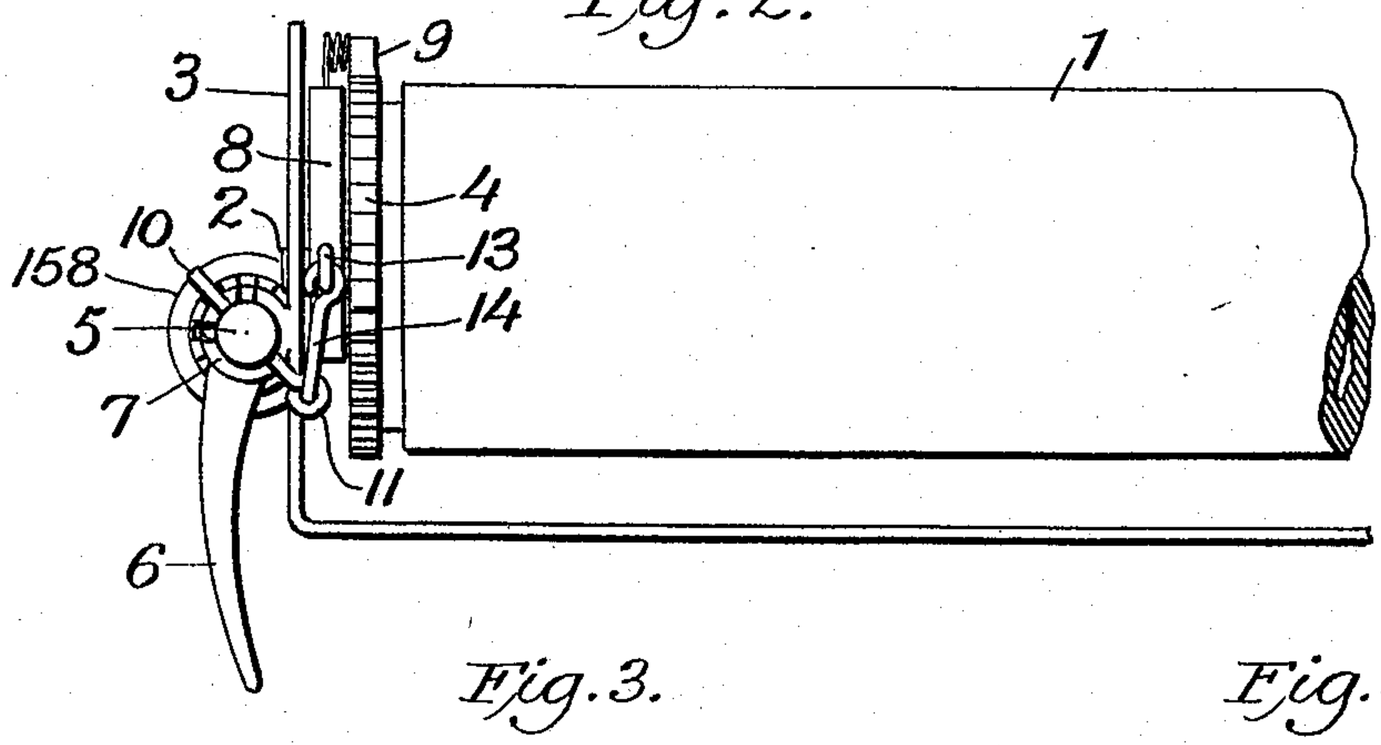

Fig. 3.

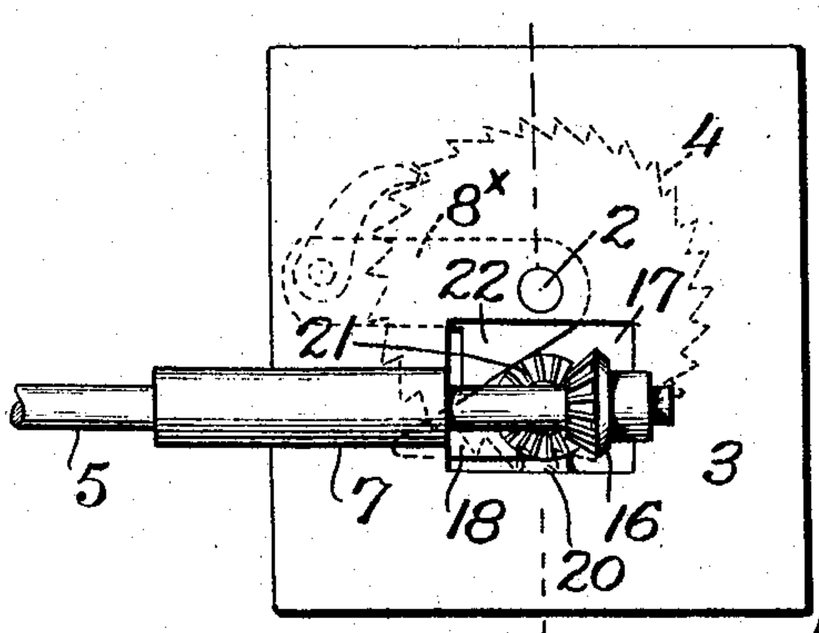

Fig. 4.

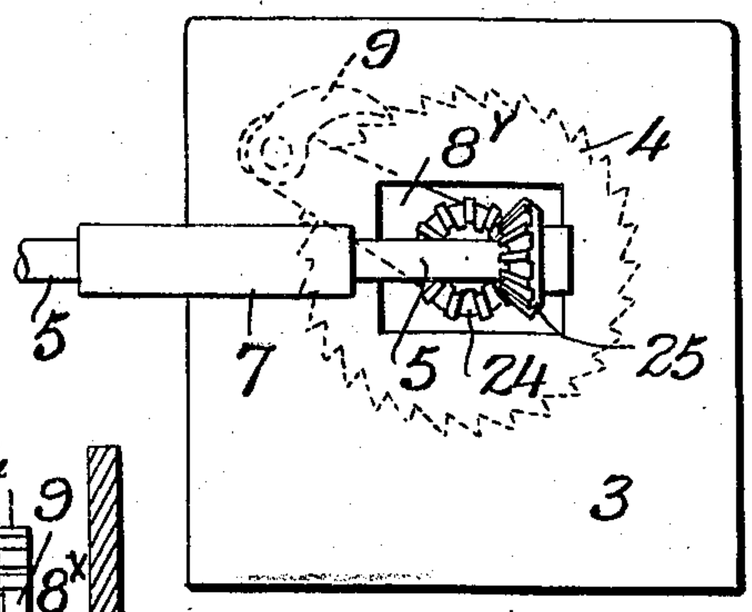

Fig. 3a.

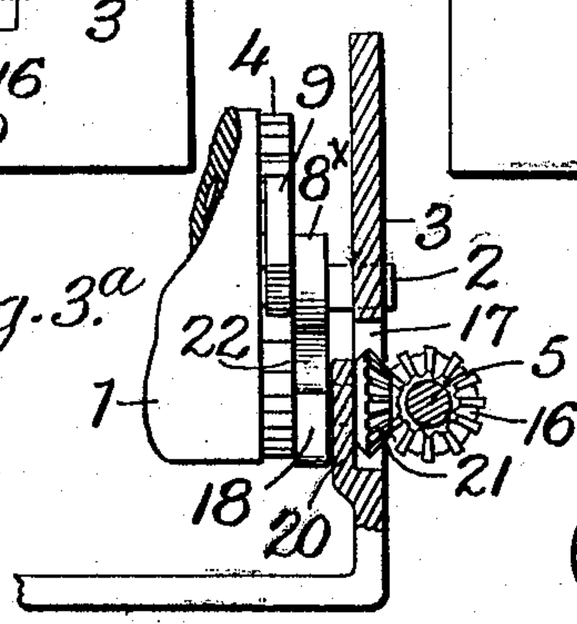

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Fig. 5.

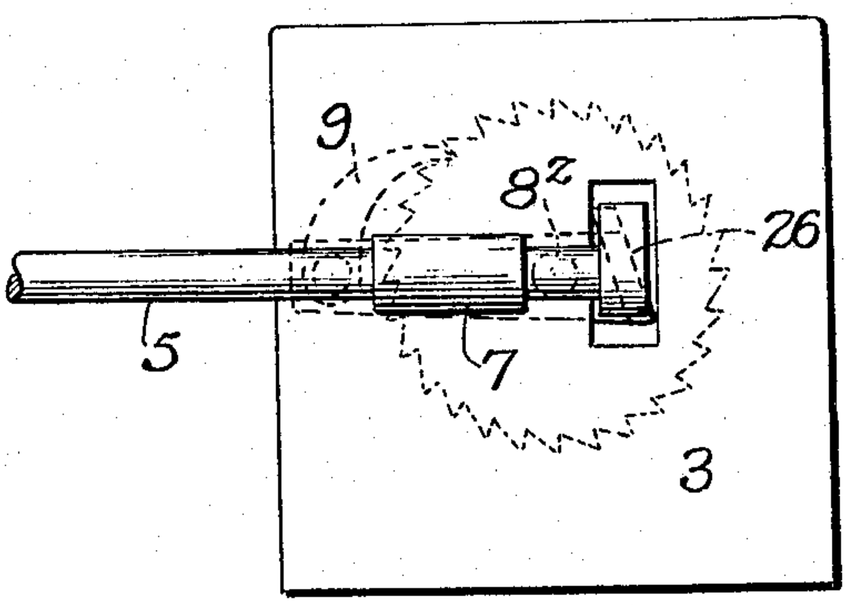


Fig. 6.

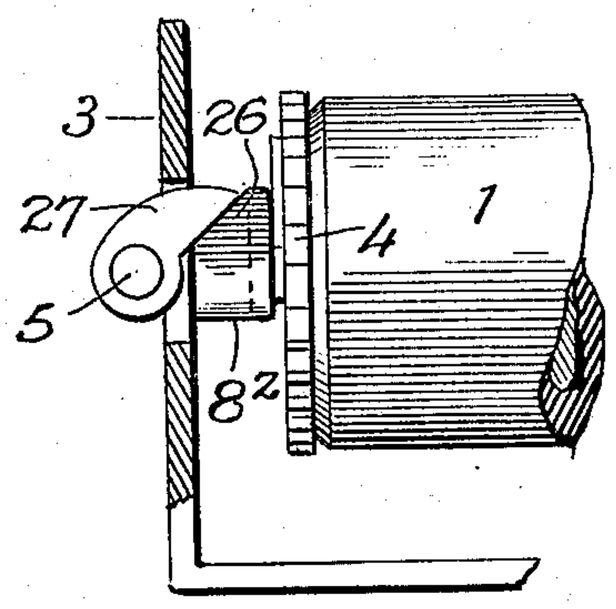


Fig. 7.

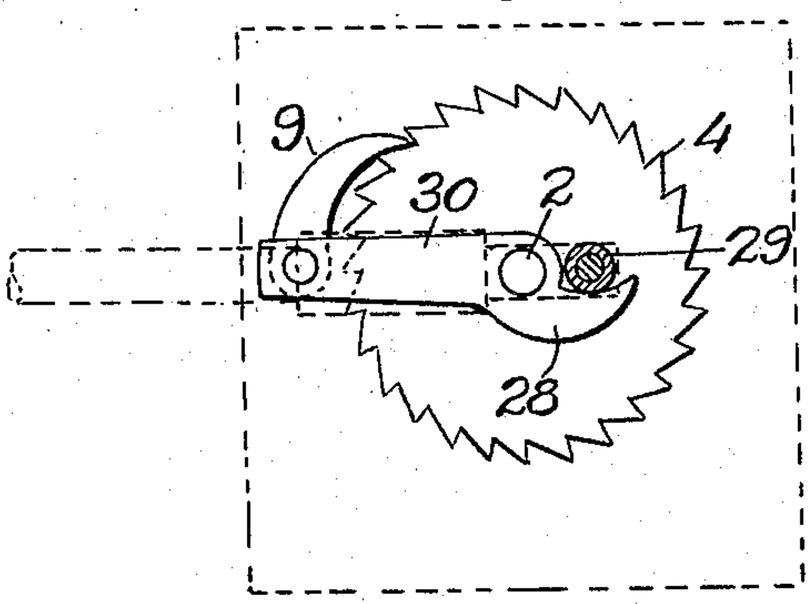
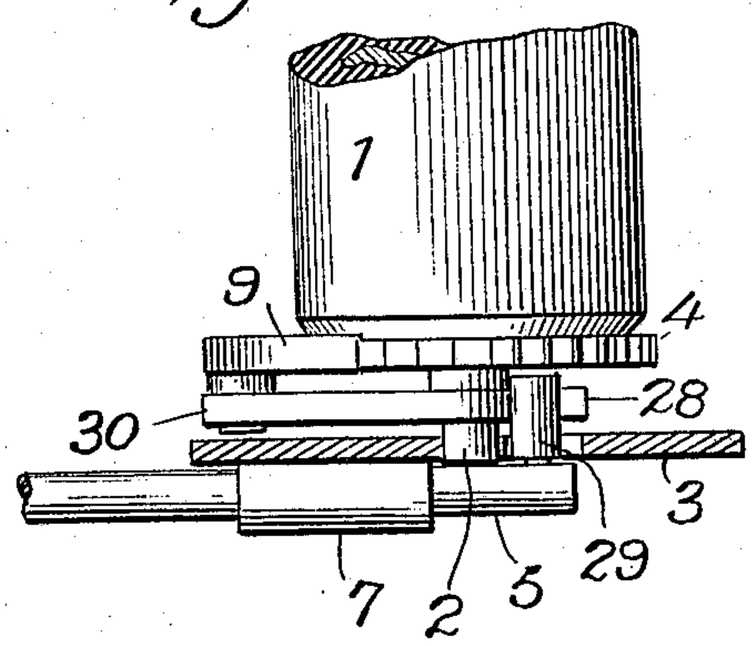


Fig. 8.



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3 SHEETS—SHEET 3.

Fig. 9.

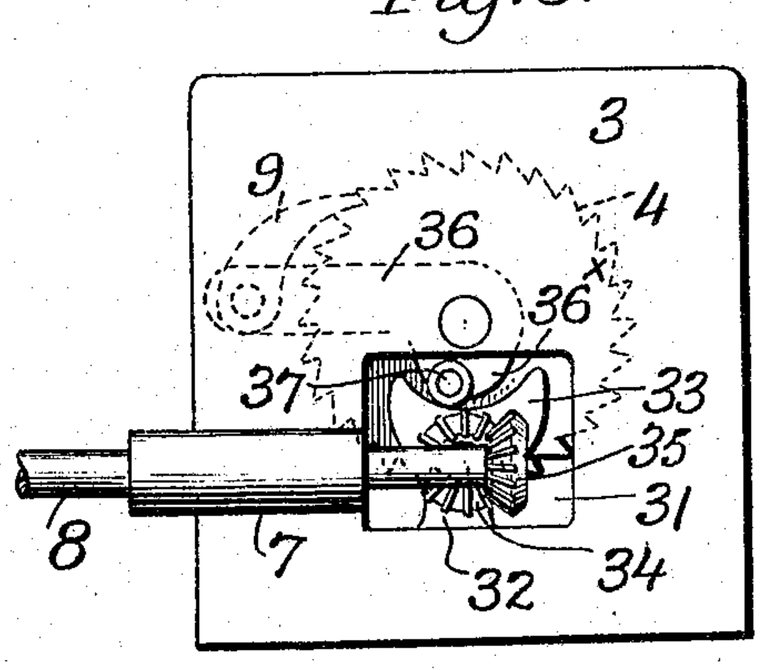


Fig. 10.

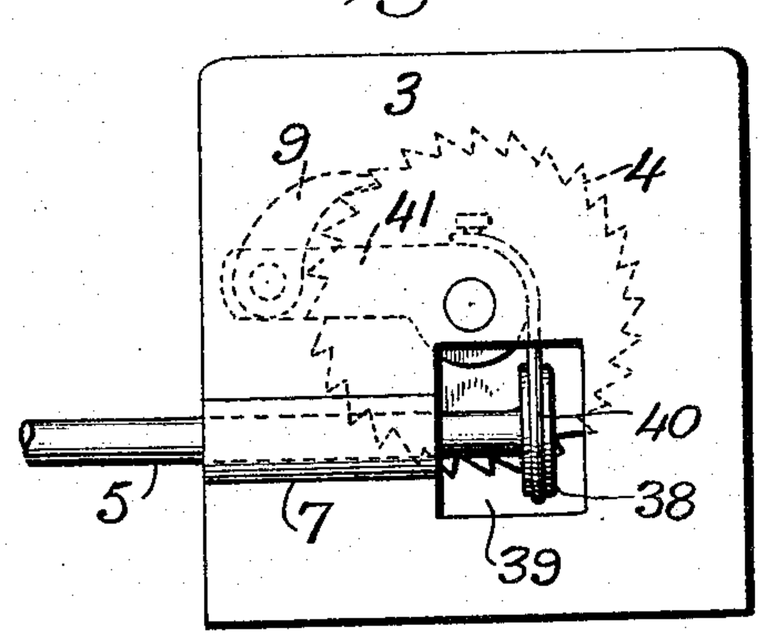


Fig. 11.

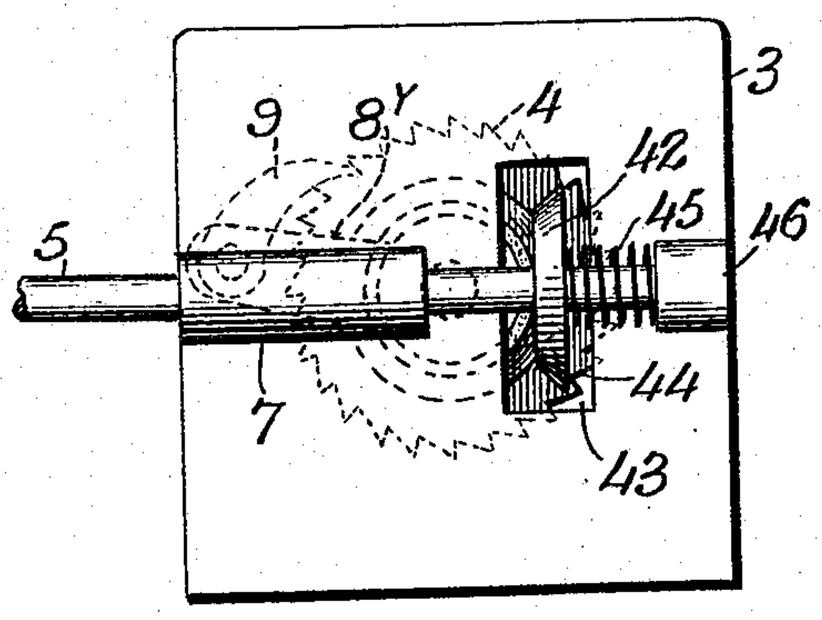


Fig. 12.

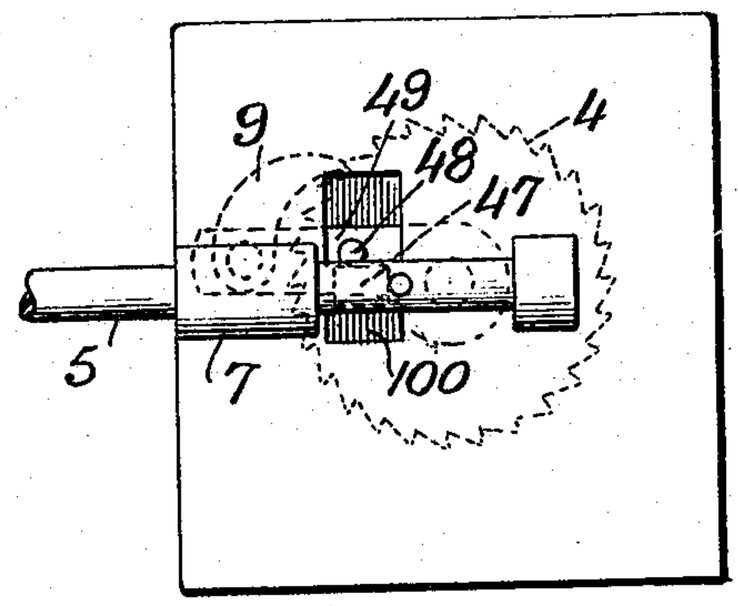


Fig. 13.

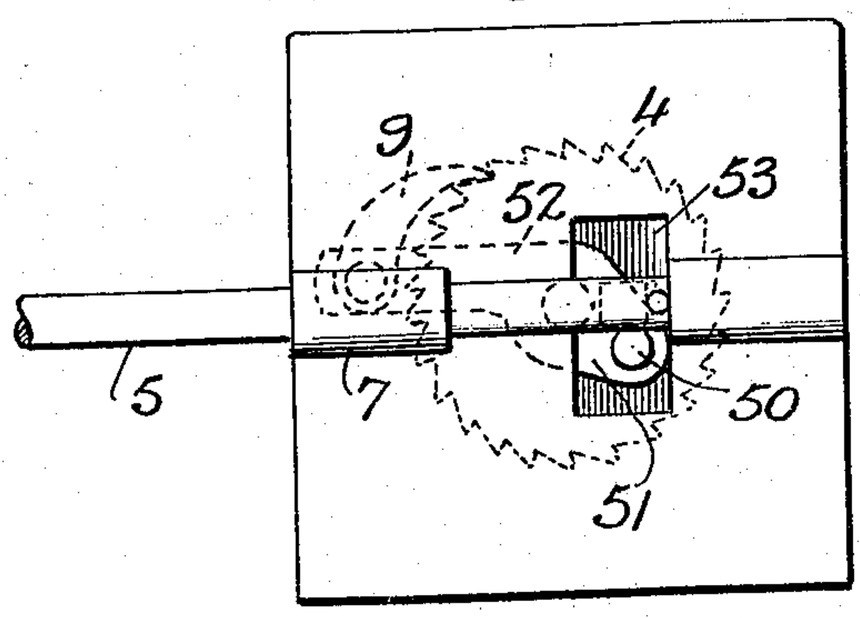
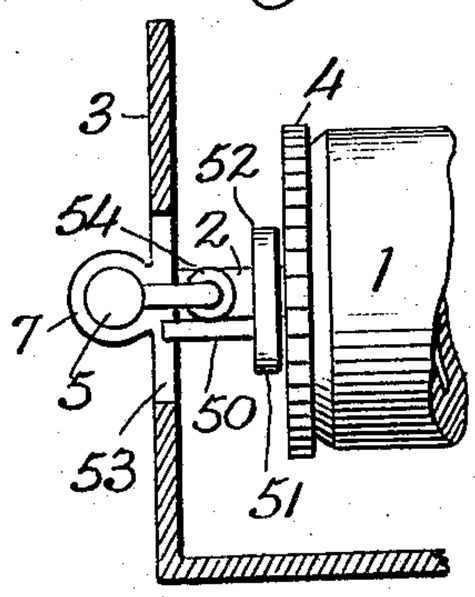


Fig. 14.



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UNITED STATES PATENT OFFICE.

FREDERICK H. WARD, OF NEW YORK, N. Y.

LINE-SPACING MECHANISM FOR TYPE-WRITERS.

No. 924,021. Specification of Letters Patent. Patented June 8, 1909.

Application filed November 27, 1906. Serial No. 345,361.

To all whom it may concern:

Be it known that I, FREDERICK H. WARD, a citizen of the United States of America, and a resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Line-Spacing Mechanism for Type-Writers, of which the following is a specification.

This invention relates to line spacing devices for typewriting machines.

The object of the invention is to furnish a simple, easily operated and effective device by means of which the platen may be rotated to the required extent to space the lines of typewritten matter.

With this end in view the invention consists in the novel features of construction and combinations of parts to be hereinafter described and finally pointed out in the claims.

In the accompanying drawings, in which the same reference characters denote corresponding parts throughout, Figure 1 is a side elevation of a line spacing device constructed in accordance with the invention. Fig. 2 is a rear elevation of the device shown in Fig. 1. Fig. 3 is a side elevation of a modified form of the device. Fig. 3[a] is a rear elevation, partly in section, of Fig. 3. Figs. 4 and 5 show in side elevation further modifications of the device. Fig. 6 is a rear elevation, partly in section, of Fig. 5. Fig. 7 is a side elevation of another form of the device, certain parts being indicated in dotted lines. Fig. 8 is a top plan view of the device shown in Fig. 7, all the parts being shown in full lines. Figs. 9 to 13 are side elevations of other forms of line spacing devices constructed in accordance with the invention. Fig. 14 is a rear elevation, partly in section, of the device shown in Fig. 13.

In the drawings 1 indicates the platen which is of the usual form, 2 the platen-shaft, and 3 the supporting frame having upright end-portions in which the shaft 2 is journaled. The platen carries at one end, preferably the right hand end as it is mounted in the machine, a ratchet 4. Said ratchet is spaced laterally from the upright end-portion of the frame 3, as shown, and it is within this space that several of the operative parts of the spacing device are located.

In all the forms of the device shown in the drawings the operation of the spacing mechanism is effected through the manipulation of an actuating rod 5 which extends forwardly from the supporting frame, at one end of the latter, toward the operator. Said rod is located in a plane parallel to that in which the ratchet 4 is located and is disposed horizontally, having at its outer end a depending handle-portion 6. The rod 5 is journaled at its intermediate portion in a sleeve-shaped bearing 7 which is preferably formed integral with one of the upright end-portions of the supporting frame and extends transversely of said portion at its outer face. By means of the handle-portion 6, the actuating rod 5 is turned in said bearing, and the movement is transmitted to the ratchet 4 and to the platen by a pawl-carrying arm mounted on the platen shaft adjacent said ratchet and by various transmitting devices, as will now be described.

Referring particularly to Figs. 1 and 2, 8 denotes an arm pivoted loosely near one end on the platen-shaft 2 between the ratchet 4 and the upright end of the supporting frame 3. Said arm has pivoted thereto at its outer end a spring-pressed pawl 9 which engages the teeth of said ratchet. The inner end of the actuating rod 5 is connected with said pawl-carrying arm by means of a pin 10 passing transversely through said rod and provided at one end with a hook 11. Said pin operates in a rectangular opening 12 in the end of the supporting frame and is connected with a hook 13 carried by the arm 8 at the end which extends slightly beyond its pivot, this connection being made by a link 14 which is bent at its ends above said hooks, as shown. The rotation of the platen is effected by the turning of the actuating rod in its bearing, whereby the shorter end of the pawl-carrying arm is pulled down through the connection described, and the upper end raised in order to push forward the ratchet by means of the pawl 9. Said pawl-carrying arm is normally in substantially horizontal position and after the actuation of the platen and the release of the actuating rod, pulls back by gravity into this position. The actuating rod is likewise returned to its initial position by the weight of its handle-portion 6 which is turned upwardly in order to advance the platen, and by its connection with the gravity-returned pawl-carrying arm. 14[a] denotes a check-pawl of any approved construction, which acts on the ratchet teeth and insures the stoppage of the platen in the proper position. The extent to which the platen is rotated is governed by the

amplitude of the movement of the actuating rod, and this is limited, in order to effect the desired spacing, by a suitable stop device.

In Figs. 1 and 2 I have shown a preferred form of stop device. The sleeve bearing 7 has rotatable thereon a collar 150 provided with a transverse slot 151. A pin 152 carried by the actuating rod 5 passes through a transverse slot 153 in the bearing 7 and into the slot 151 of the collar 50. Said collar is provided at its rear edge with a series of small indentations or recesses 154 adapted to engage a pin 155 on the sleeve bearing 7. A helical spring 156 is interposed between a pin 157 at the forward edge of said bearing and a milled flange 158 on the collar 150, and normally forces said collar into engagement with the pin 155 so that said pin fits within one of the recesses 154. The collar 150 may be set angularly on the bearing 7 by pulling the former against the action of the spring 156, the milled flange 158 being grasped for this purpose, and then turning the collar until the proper recess 154 is opposite the pin 155. The seating of said pin in such recess will take place upon the release of the collar, as will be understood. In this way the slots 151 and 153 of the collar and bearing respectively may be brought more or less into register and consequently the actuating rod pin 152 will be permitted to transverse the entire length of the sleeve bearing slot 153 when the actuating rod is turned, or only a predetermined part of the length of said slot. Consequently the amplitude of movement of the pin 152 and actuating rod is controlled, so that said rod will be turned to space one, two or more times, as desired.

In the form shown in Figs. 3 and 3^a, the actuating rod is provided at its inner end with a beveled pinion 16 operating in an opening 17 in the end of the supporting frame. A cam 18 having an inclined edge is journaled in an arm 20 of said frame which extends upwardly from the lower edge of the opening 17, and said cam is rotated on its axis by means of a beveled pinion 21 carried thereby and meshing with the pinion 16 on the rod. The pawl-carrying arm 8^x is provided near its pivot with a cam-portion 22 having an inclined edge abutting against the inclined edge of the cam 18. The rotation of the cam 18 by means of the actuating rod and the pushing upward of the arm 8^x by the coöperation of said cam with the cam-portion 22, effect the rotation of the platen, as will be understood.

In the form shown in Fig. 4 the pawl-carrying arm 8^y carries at its pivot a beveled pinion 24 which meshes with a similar pinion 25 carried by the actuating rod at its inner end. The operation of this form of the device will be very readily understood.

Figs. 5 and 6 illustrate a construction in which the pawl-carrying arm 8^z is bent laterally at its pivoted end, the lateral portion being provided with an inclined edge 26 to coöperate with a cam 27 mounted on the inner end of the actuating rod 5. The turning of said rod to the right causes the cam 27 to depress the lateral inclined portion of the pawl-carrying arm and to raise the pawl, whereby the platen is advanced. The parts are returned to their initial position of gravity, as in the forms hereinbefore described.

The pawl-carrying arm may have a hook-shaped end 28 extending beyond the pivot, as shown in Figs. 7 and 8, this end receiving a smaller roller 29 extending laterally from the actuating rod at the inner end of the latter. In said figures, 30 denotes the pawl-carrying arm. The roller 29 operates in a suitable aperture in the frame. It is evident that the turning of the actuating rod toward the right will turn the roller 29 in downward direction and this in turn will depress the shorter end of the arm 30 whereby the pawl 9 at the other end of said arm moves forwardly and advances the ratchet and platen.

Fig. 9 illustrates a construction in which the supporting frame is provided with a rectangular opening 31 and, extending upwardly from the lower edge of this opening is an arm 32 in which a lunate or crescent-shaped cam 33 is journaled. Said cam carries a beveled pinion 34 which meshes with a similar pinion 35 carried by the actuating rod 5. The pawl-carrying arm 36 is provided near its pivot with an enlargement 36^x, and extending laterally from this enlargement and into engagement with the upper concave edge of the lunate cam is a small anti-friction roller 37. Said roller is located close to the pivot of the pawl-carrying arm, and when said arm is in its normal position, shown in Fig. 9, is midway of the length of the concave edge of the cam. It is apparent that the rocking of the actuating rod in its bearing causes the cam to move the pawl-carrying arm upwardly, this being due to the shape of the cam, thereby causing the advance of the pawl and of the platen.

In the arrangement shown in Fig. 10 the actuating arm 5 carries at its inner end a grooved pulley 38 rotatable in an opening 39 in the supporting frame. A flexible wire or similar device 40 is attached at one end to the upper edge of the pawl-carrying arm 41 between the pawl and the pivot, and at the other end to said pulley. The turning of the actuating rod will evidently cause the pawl-carrying arm to be pulled upwardly and give a platen-advancing movement. The parts are returned to their initial or normal position by gravity, as heretofore.

Instead of being positive, the connection between the actuating rod and the pawl-carrying rod may be frictional, as illustrated in Fig. 11. In said figure, 42 denotes a small friction-wheel mounted on the actuating rod

and provided with a beveled circumference. Said wheel is rotatable in an opening 43 in the supporting frame and frictionally contacts with a similar friction wheel 44 mounted on the pawl-carrying arm 8^y at the pivot thereof. The beveled circumferences or peripheries of said friction-wheels are firmly held in contact with each other by means of a helical spring 45. In this form an additional bearing sleeve 46 for the actuating rod is provided, and said spring 45 embraces the actuating rod and is interposed between said sleeve 46 and the friction-wheel 42 on the actuating rod. The operation of this form of the device will be manifest.

In the construction shown in Fig. 12, the actuating rod is journaled in two sleeve bearings, as in the form last described, and carries on its inner surface an anti-friction roller 47 extending parallel to the axis of said rod and through an opening 100 in the frame. Said roller engages under a pin 48 which extends laterally from the pawl-carrying arm 49 intermediately between the pawl and the pivot. The turning of the actuating rod to the left causes the roller 47 to be raised, and said roller pushes upwardly the pawl-carrying arm and imparts to the same its platen-advancing movement.

The construction shown in Figs. 13 and 14 is very much like that shown in Fig. 12, except that the pin carried by the pawl-carrying arm is located at the opposite side of the pivot or fulcrum from the pawl. In said figures, 50 denotes said pin which is mounted on an extension 51 of the pawl-carrying arm 52 and extends through an opening 53 in the frame. 54 denotes the roller carried by the actuating rod and engaging the pin 50. In this form, the actuating rod has to be turned to the right, instead of to the left, as in the form last described, as will be understood.

Having thus described my invention, I claim:

1. In a line spacing device for typewriters, the combination of an actuating rod provided with a laterally extending pin, a sleeve in which said rod is journaled and which is provided with a slot through which said pin projects, a collar mounted on said sleeve and likewise provided with a slot through which said pin projects, and means whereby said collar may be angularly adjusted. on said sleeve.

2. In a line spacing device for typewriters, the combination of an actuating rod provided with a laterally extending pin, a sleeve in which said rod is journaled and which is provided with a slot through which said pin projects, a collar mounted on said sleeve and likewise provided with a slot through which said pin projects, said collar being provided at one edge with a series of seats or recesses, a pin on the sleeve to engage in said recesses, and a spring urging said collar toward said last-named pin.

Signed at New York city, this 22nd day of November, 1906.

FREDERICK H. WARD.

Witnesses:

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C. B. SCHROEDER.