(No Model.)

J. A. WATSON.

TYPE WRITING MACHINE.

No. 477,237. Patented June 21, 1892.

Fig. 1

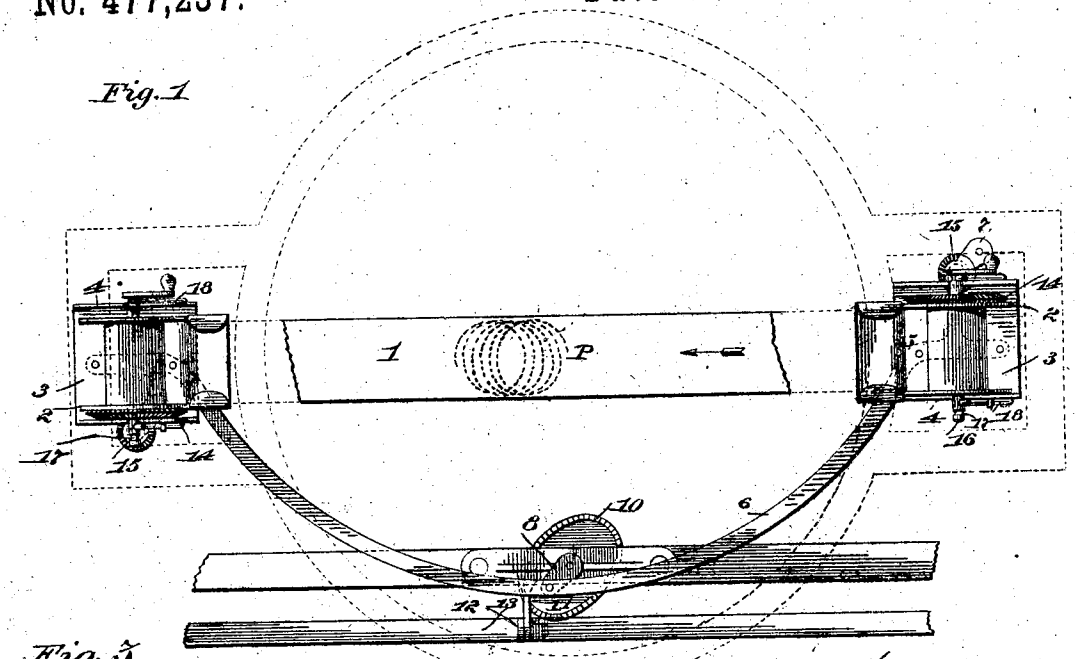


Fig. 3

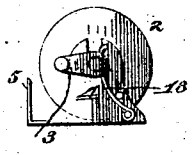


Fig. 4

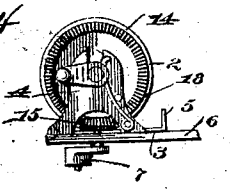
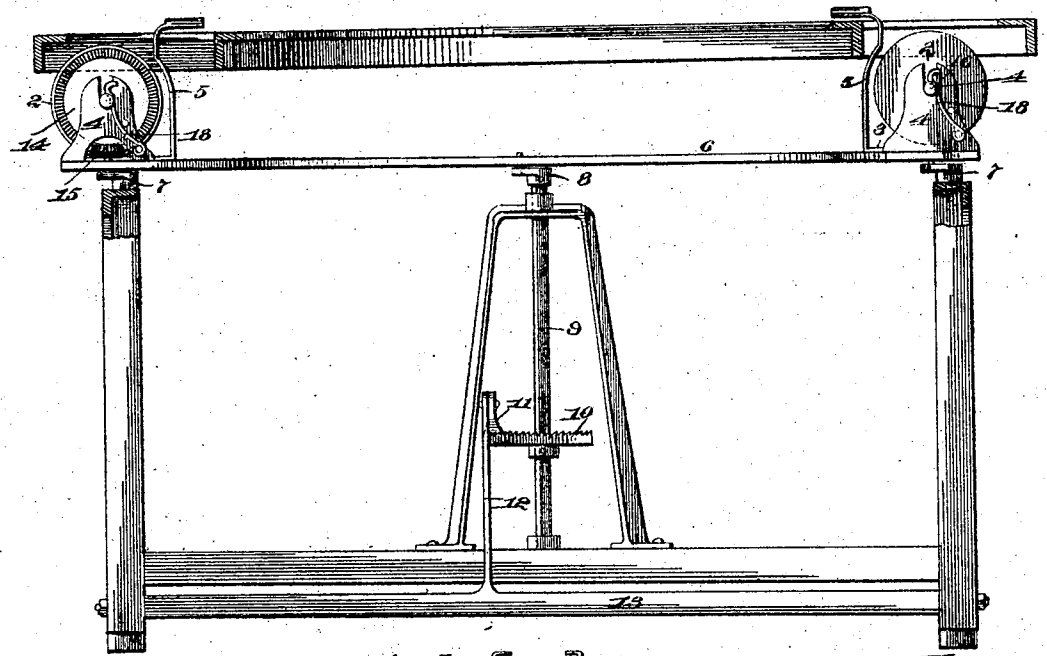


Fig. 2

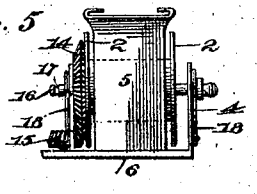


Witnesses;

J. V. Coleman

D. Wallace Duncan

Fig. 5



Inventor

J. A. Watson

UNITED STATES PATENT OFFICE.

JAMES A. WATSON, OF WASHINGTON, DISTRICT OF COLUMBIA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 477,237, dated June 21, 1892.

Application filed May 19, 1892. Serial No. 433,554. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. WATSON, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to ribbon-feeding devices for type-writers; and it consists in mechanism for feeding the ribbon automatically both lengthwise and widthwise, so as to use its entire surface as it passes once through the machine.

In the accompanying drawings, in which like reference-signs refer to similar parts throughout the several views, Figure 1 is a plan view of mechanism embodying my invention, part of the frame of a type-writer being shown in dotted outline. Fig. 2 is an elevation of the same including so much of a type-writer frame as is necessary to support the mechanism. Figs. 3 and 4 are front end views of the spool-supports and spools; and Fig. 5 is a view of one of the spool-supports, looking from the middle of the machine.

In a companion application, Serial No. 428,384, filed April 8, 1892, I have shown and described mechanism for imparting a simultaneous rotary movement to two spool-supports, the spools being maintained in a constant relation to each other, whereby the ribbon is also rotated bodily, thus causing the printing-point to travel relatively over the ribbon in a circle inscribed between the margins. The machine described in said application moves the ribbon longitudinally but once during each lateral rotation. In the present invention the spool-supports are rotated in a manner substantially similar to that described in the above-mentioned application; but the ribbon is moved lengthwise each time the spool-supports are moved, thereby causing the printing-point to travel relatively to the ribbon in a continuous overlapping spiral line, such as is indicated in Fig. 1 of the drawings. The present invention furthermore differs from that described in the other application in various details of construction, which will be hereinafter pointed out.

Referring to the drawings, 1 indicates the ribbon, a small portion only being shown, and 2 indicates the spools. Each of the spools is mounted in a spool-support consisting of a piece of sheet metal shaped and bent to form a base 3 and uprights 4, the uprights being provided with bearings for the spool-shafts. Ribbon-guides 5 are also constructed of sheet metal and are preferably made integral with the base. The spool-supports are both securely fastened to a curved connecting-rod 6, and the supports and their connecting-rod are carried by two idle-cranks 7 and 7 and a driving-crank 8, all of said cranks being of the same size and having the same throw. The crank 8 is mounted upon the end of a driving-shaft 9, upon which is a ratchet-wheel 10. The ratchet-wheel is preferably elliptical and is operated by a pawl 11 upon an arm 12 of a rock-shaft 13. The rock-shaft may be vibrated in any convenient way, such as by being connected to a universal bar under the key-levers.

Upon each of the spool-shafts is a bevel-gear 14, which may form one end of the spool, if desired, and upon the upper ends of the crank-pins of two of the cranks are pinions 15, adapted to mesh with the gears 14. The spool-shafts 16 are movable lengthwise in their bearings to a sufficient extent to engage and disengage the gears 14 with the pinions, and for the purpose of holding them either in or out of mesh with the pinions I provide grooves 17 in the spool-shafts and springs 18, arranged to press into the grooves and prevent the shafts from shifting lengthwise, except when they are moved purposely. As shown, there is a groove 17 upon each end of each shaft and a spring upon each bearing, the spring upon one bearing being adapted to lock the gear in mesh with the pinion and the spring upon the opposite bearing being adapted to lock it out of engagement therewith. The crank 7 and pinion 15 at one side of the type-writer are in the rear of the spool and the crank and pinion upon the opposite side of the type-writer are in front of the spool. In order to drive the ribbon in the direction of the arrow, the spools are both pushed toward the rear of the machine, as shown in Fig. 1. When it is desired to change the direction of the ribbon, both spools are drawn toward the front of the machine, which has the effect of disengaging one spool from its pinion and engaging the other.

In operation the driving-crank and the idle-cranks rotate simultaneously and the spools and spool-supports are rotated bodily in a plane parallel with the plane of the ribbon. At the same time the spool which is in gear with one of the pinions 15 is rotated upon its axis, and the ribbon thus moved lengthwise. The effect of these movements is that the printing-point P travels relatively to the ribbon in a continuous overlapping spiral, as indicated by the dotted line upon the ribbon in Fig. 1. Where the loops of the spiral cross near the margins of the ribbon, the ribbon would be used more than at other points if the rotary movement of the cranks were uniform. To correct this is the function of the elliptical ratchet-wheel 10. The ratchet-wheel 10 causes the ribbon to travel faster when its margin is opposite the printing-point than during other parts of its rotation, and in this way all parts of the ribbon are used substantially to the same extent.

I claim—

1. In a type-writer, the combination, with the ribbon and spools, of spool-supports, connections between said supports for maintaining the spools in a constant relation to each other, cranks for imparting a rotary movement to the spool-supports, and connections between the cranks and the spools for rotating the latter as the cranks revolve, substantially as described.

2. In a type-writer, the combination, with the ribbon and spools, of spool-supports, connections between said supports for maintaining the spools in a constant relation to each other, cranks for imparting a rotary movement to the spool-supports, and gears upon the crank-pins and spool-shafts for rotating the spools when the cranks are rotated, thereby imparting a spiral movement to the ribbon, substantially as described.

3. In a type-writer, the combination, with the ribbon and ribbon-spools, of spool-supports, spool-shafts mounted in said supports, cranks for imparting rotary movement to said supports, gears mounted upon the crank-pins, and gears mounted upon the spool-shafts, said shafts having a longitudinal movement in their bearings to permit the gears to be engaged or disengaged, substantially as described.

4. In a type-writer, the combination, with the ribbon and ribbon-spools, of the spool-supports, each consisting of a base 3, side bearings 4, and ribbon-guide 5, the frame 6, connecting the spool-supports, and the supporting cranks 7 and 8, substantially as described.

5. The combination, with the ribbon and ribbon-spools and the spool-shafts having grooves 17 at each end, of the spool-supports having bearings 4, springs 18, attached to the bearings, the cranks for imparting a rotary movement to the spool-supports, and the gears mounted, respectively, upon the spool-shafts and the crank-pins, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES A. WATSON.

Witnesses:
WILL E. NEFF,
ALLE N. DOBSON.