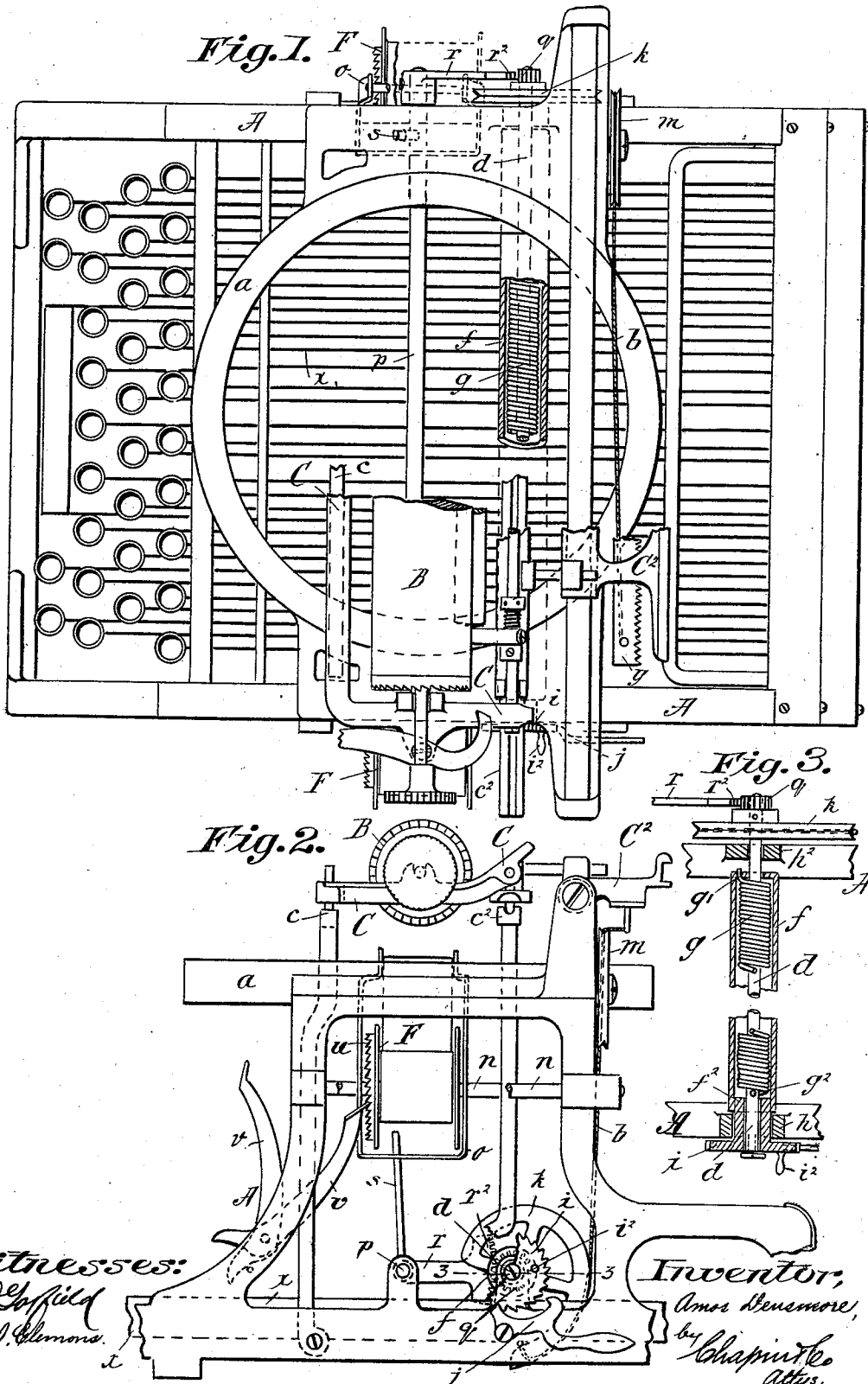


A. DENSMORE.
TYPE WRITING MACHINE.

Patented Oct. 31, 1893.



UNITED STATES PATENT OFFICE.

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TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 507,726, dated October 31, 1893.

Application filed March 8, 1893. Serial No. 465,201. (No model.)

To all whom it may concern:

Be it known that I, AMOS DENSMORE, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to improved devices in a typewriting machine for the propulsion of the carriage, and for the bodily movement of the ribbon rolls in a direction at right angles to the travel of the carriage.

The objects of the invention are to generally improve devices of the class indicated in point of simplicity, utility, practicability of construction and convenience of application upon the machine.

In the class of carriage propelling devices to which this invention relates there is comprised a long, spirally wound spring applied for a torsional action upon a shaft which has a suitable connection with the carriage; and the rocking movement of the shaft as impelled by the reaction of the spring to force, through the intermediate connection, the carriage to the full extent of its run, however great, does not perceptibly "run down" the spring, that is diminish the force of its propelling impulse.

The invention is fully described in the following description taken in connection with the accompanying drawings and is clearly defined in and by the claims.

In the drawings, Figure 1 is a plan view of the framing and so much of other parts of a typewriting machine as to clearly show the application thereupon of the mechanism of this invention, part of the carriage and platen being broken away so as to more clearly show the novel devices. Fig. 2, is an end view, and Fig. 3 is a horizontal sectional view of parts taken on the line 3—3, Fig. 2.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the framing of the machine having a ring-top, *a*, as usual, centrally within which the type of the type-bars are brought to printing impact against the under side of the platen, B, which is mounted upon the carriage, C. The carriage runs, or slides, longitudinally on the front

and rear slide-rails, *c*, *c*², therefor, and has, at its rear, an appliance or auxiliary portion, C², which, so far as this invention is concerned, may be regarded as a part of the carriage, it moving endwise as one therewith, and, to this part, connection is had by the flexible connection, *b*, which forms part of the propelling device, which device will be now particularly described.

d represents a shaft which is journaled at the lower part of the machine parallel with the run of the carriage, it having its position across and just above the key-levers, *x*, and terminating near the opposite ends of the machine; the tube, *f*, surrounds the said shaft there being an annular space between its inner wall and the shaft within which is located the spiral spring, *g*, which, as will be seen, encircles the shaft for a considerable portion of its length; one end, *g*¹, of the said spring is connected to the end portion of the tube while its other end, *g*², is connected to the shaft. The tube, at its one end portion, has the extremity of the sleeve, *f*², fitted, and brazed or otherwise firmly united, therein, the said sleeve extended through the journal-lug, *h*, of the framing, and having formed thereon, or attached thereto, the ratchet-wheel, *i*. The extremity of the shaft is fitted loosely through this sleeve to have its free rotational movement therein, and the other end portion of the shaft being extended through and beyond the other journal-lug, *h*².

j represents a double toothed or escapement pawl which is pivotally mounted on the side of the frame to have one or the other of its teeth in engagement with the ratchet-wheel to act as a detent. The ratchet-wheel has the cranked arm or stud, *i*², whereby to conveniently rotate the sleeve for the purpose of winding up the spring to insure any degree of torsional reaction upon the shaft, *d*. By vibrating the escapement pawl, *j*, through its handle-arm, the tube may be permitted to turn, to unwind more or less as desired, the said spring. The said shaft, *d*, has at its end, opposite that at which the ratchet is located, a revoluble element, *k*, to which an end of the said flexible connection, *b*, is secured, and peripherally with which this cord or like means of connection has its bearing; and the cord is intermediately guided and supported

by the sheave, *m*, on the rear side of the machine frame, the plane of rotation of the latter being parallel to the travel of the carriage. As shown the aforementioned revoluble element, *k*, is comprised in the form of a snail or involute cam, the cord being connected to its portion having the greatest distance from the axis, this, as well known in such devices, acting as a compensator to correspond in its increasing winding power as it continues to turn to the diminution in the stress of the propelling spring. A compensating device of this character, however, is of less importance in the present improved machine than in machines wherein involute springs are employed;—nevertheless it is employed in preference to a pulley or sector which might be substituted for it.

It will be perceived that although the revoluble element, *k*, turns in a plane at right angles to the plane of the sheave, *m* the edge of the latter is nearly vertical above the edge of the former so that the cord may have its sufficiently direct guiding support to its draft connection with the carriage for impelling the latter longitudinally as permitted by the escapement devices therefor. The escapement devices for the carriage are not shown, although the ratcheted bar comprised in this device is partially indicated at *y*.

The ribbon rolls, *F*, or spools, are mounted at each end or near the top of the machine each on a shaft, *n*, therefor, which ranges horizontally fore and aft, these rolls being inclosed within yokes or carriers, *o*, which, with the rolls, may be moved bodily fore and aft on the shafts, *m*.

Near the bottom of the machine frame, but just above the key-levers, is the shaft, *p*, which ranges parallel with the aforesaid tube-inclosed-shaft, *d*; the said shaft, *d*, has on its end the gear-wheel (pinion) *q*, while the said shaft, *p*, has at its one end the rearwardly and horizontally extended arm, *r*, with the sector-gear, *r*², at its extremity which is in mesh with the aforesaid pinion, *q*; the said shaft, *p*, has near both of its ends under the ribbon rolls the upwardly extended radial arms, *s*, *s*, which are for moving the ribbon rolls slightly fore and aft as the shaft, *d*, has its rocking movements to drive the carriage. The medium of connection, as will be seen, between the shaft, *d*, and the carriage, is such a one that a rocking of the shaft amounting to only a small part of a rotation, will so greatly multiply the extent of movement of the carriage as to insure its full run whether it be seven or twelve inches, more or less, and it will also be perceived that the connection between the gear wheel, *q*, on the shaft, *d*, and the ribbon roll, consisting of the rock-shaft and sector-gear-arm and arm, *s*, is such as the aforesaid rotational movement of the shaft, *d*, will only cause a fore-and-aft play of the ribbon rolls equal to any portion of the width of the ribbon. The means for securing the winding or unwinding movements of

the ribbon rolls is comprised in pawl and ratchet devices which are shown in Fig. 2.

The ratchet-teeth, *v*, are circularly arranged on the head of the ribbon roll and the pawl, *v*, is pivoted on the frame, with its toothed extremity inclined toward the ratcheted head. As the said head in its cross movement reaches the pawl, causing the point of the latter, as the pawl swings in the direction of the movement of the roll to also rise, the ratcheted roll is, by the so-rising pawl-point caused to rotate to the extent of one or more teeth.

Both of the ribbon rolls are so ratcheted and two of the pawls are provided, one at each end of the machine, and operate, one at a time, to rotate the ribbon rolls in opposite directions. While one pawl is in working relation to the ribbon roll, the pawl at the other end of the machine is swung out of its operative position, as indicated by the dotted lines in Fig. 2.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a typewriting machine, the combination with the platen carriage, of a shaft mounted in suitable bearings for rotation at the lower part of the machine parallel with the run of the carriage, a spiral spring coiled around the shaft, and a tube surrounding the shaft and spring, one end of the spring being connected to the tube and the other end to the shaft, and a medium of connection between the shaft and carriage, substantially as described.

2. In a typewriting machine, the combination with the platen carriage, of a shaft mounted in suitable bearings for rotation at the lower part of the machine parallel with the run of the carriage, a spiral spring coiled around the shaft for a considerable portion of its length with one end suitably anchored and the other connected to the shaft, an element mounted to have a revoluble movement with the shaft, a flexible connection secured to said revoluble element with a portion thereof lying over the rim and thence suitably extended and guided to a draft connection with said part of the carriage, substantially as described.

3. In a typewriting machine, the combination with a part of the carriage of the shaft journaled and extended at the lower part of the machine parallel with the run of the carriage, a spiral spring coiled around the shaft for a considerable portion of its length, a snail or involute cam fixed on the shaft, and the flexible connection having a connection with the involute cam and with the carriage and an intermediate guide pulley for the said flexible connection which is in a plane parallel with the travel of the carriage, substantially as described.

4. In a typewriting machine, the combination with a ribbon roll, and a way on which it is movable at right angles to the run of the carriage, of a shaft journaled at the lower

part of the machine and having a spring applied thereto for imparting a rocking movement thereto in one direction, a gear wheel on said shaft, a rock-shaft having a sector gear arm in mesh with said shaft-gear and an arm to move the ribbon roll, substantially as described.

5. In a typewriting machine, the combination with the carriage, of a shaft journaled for a rocking movement at a lower part of the machine parallel with the run of the carriage, a tube surrounding the shaft, and a spring coiled around the shaft having one end connected thereto and its other to the tube, a medium of connection between the shaft and carriage, a ratchet-wheel connected to the tube, and an escapement pawl in operative relation to the ratchet-wheel, substantially as and for the purposes set forth.

6. In a typewriting machine, the combination with the carriage, of a shaft journaled for a rocking movement at a lower part of the machine parallel with the run of the carriage, a tube surrounding the shaft, and a spring coiled around the shaft having one end connected thereto and its other with the tube, a medium of connection between the shaft and carriage, a ratchet-wheel connected to the tube having a crank handle, and an escape-

ment pawl in operative relation to the ratchet-wheel, substantially as and for the purposes set forth.

7. In a typewriting machine, the combination with the carriage, of a shaft journaled at the lower part of the machine parallel with the run of the carriage and having the tube surrounding it, and the gear wheel at its end, a spring coiled around the shaft, and inclosed by the tube, its one end being connected to the shaft and its other to the tube, the revoluble element on the shaft having the cord connected thereto and peripherally engaged therewith, said cord having a draft connection with the carriage,—being intermediately suitably supported and guided,—a pair of ribbon rolls, and shafts on which they are mounted for movements at right angles to the run of the carriage, a rock-shaft parallel with said spring-surrounded-shaft, having an arm comprising a sector gear and having near its ends radial arms for moving the ribbon-rolls at right angles to the run of the carriage, and all arranged substantially as described.

AMOS DENSMORE. [L. S.]

Witnesses:

CHAS. SEARLE,

A. D. STURDEVANT.