

UNITED STATES PATENT OFFICE.

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TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 791,420, dated May 30, 1905.

Original application filed January 9, 1893, Serial No. 457,800. Divided and this application filed November 10, 1896. Serial No. 611,607.

To all whom it may concern:

Be it known that I, FREDERIC W. HILLARD, a citizen of the United States of America, residing at Tottenville, county of Richmond, State of New York, have invented certain new and useful Improvements in Type-Writers, of which the following is a specification.

This application is a division of my application, Serial No. 457,800, filed January 9, 1893, on which has issued Patent No. 580,281, dated April 6, 1897.

My present invention is an improvement in type-writing machines, and relates to line-locks, or, in other words, to the mechanism whereby the keys are automatically locked at a predetermined point in the line of print to notify the operator of the approach of the end of the line and to prevent him from printing letters one over the other at the end of the line.

My invention relates, first, to an improvement in the line-lock itself, and, second, to means for releasing the keys and the escape-ment from the line-lock to print an additional letter or letters beyond the locking-joint in the line.

The improvement in the line-lock itself comprises mechanism whereby the arrival of the carriage at the predetermined point in the line automatically locks the keys, so as to prevent printing without any independent movement of the line-lock. In certain line-locks heretofore invented an independent movement in the line-lock has been necessary to lock the keys and prevent printing. Hence in such former constructions it has been necessary to move the parts in the line-lock out of their normal positions into their locking positions in order to lock the keys. In the construction used by me, on the contrary, the keys are locked by the arrival of the carriage at the predetermined locking-point without any independent movement of the line-lock and while the line-lock is in its normal position of rest. Hence in this construction the keys can be locked to prevent printing without the expenditure of any force whatever beyond that required to ad-

vance the carriage to the predetermined locking-point, while in the former constructions referred to the force necessary to advance the carriage to the locking-point is necessary, together with the additional force necessary to move a part of the line-lock from its normal position into its locking position. Hence this feature of my invention, which consists in certain features of construction of the line-lock, results in a substantial saving of power.

My improvement for releasing the keys from the line-lock to print an additional letter or letters beyond the locking-point comprises an independent key for the purpose. By an "independent" key I mean a key having an operative connection with the line-lock when the line-lock is in its obstructive position and means operated by the key for independently moving the line-lock out of its obstructive position. In certain line-locks heretofore invented means have been provided for unlocking the line-lock for printing additional letters; but such means have not included an independent key for the purpose. For example, line-locks have been invented in type-writers provided with paper-carriages which are shifted from one printing-center to another to print lower-case letters and upper-case letters in which the locking device is on the carriage and is operative when the carriage is in position for printing lower-case letters, but is inoperative when the carriage is in its shifted position for printing capital letters. In this construction, therefore, when the line-lock is in its obstructive position the shifting of the carriage from lower case to upper case removes the obstruction in the line-lock and releases the type-keys.

In one example of the construction above referred to the key which shifts the carriage from lower case to upper case may indirectly, by shifting the carriage, be utilized to unlock the line-lock; but in the said construction the key which shifts the carriage from lower case to upper case is obviously not an independent line-lock-release key, since it can only release the line-lock by shifting the car-

riage. The advantage of an independent line-lock-release key is that it performs its office independently and without the performance of any other essential function, and hence can always be relied on to perform its office correctly and accurately. On the other hand, any key excepting an independent line-lock-release key is uncertain and unreliable. For instance, the key in the construction referred to can only release the line-lock by shifting the carriage, and therefore if for any reason the carriage cannot be shifted the key cannot release the line-lock, while, on the other hand, if the key is depressed to print capitals before the line-lock has been obstructed the line-lock fails to work at all, with the result that the operator is deceived and in danger of printing letters one over the other at the end of the line because of the failure of the line-lock to obstruct the keys. An independent line-lock-releasing key, therefore, within the meaning of this specification is a key which when performing its function of a line-lock releaser is incapable of performing any other function in the operation of writing—*i. e.*, at the time stated performs no function in printing or causing one type instead of another to print. This feature of my invention consists in certain novel features in the construction of the independent line-lock-release key, and in so far as such novel features are concerned I do not wish to limit myself to any particular form of line-lock, but wish it to be understood that they are applicable with any of the various forms of line-lock known in the art.

In the accompanying drawings I show two examples of independent line-lock-release keys, one being mounted on the carriage and the other in the keyboard.

My invention further consists in the combination of the two features above designated—*viz.*, in the construction of a line-lock which is moved out of normal position by a movement of a spaced part to prevent further movement of such parts and an independent key for removing such line-lock out of its obstructive position.

It, moreover, consists of a stop forming a part of the line-lock and carried by a moving part and an independent key conveniently mounted on a part of the machine other than the part carrying the stop and means for transmitting motion from the key to the moving stop to release the line-lock.

It further consists in the construction, arrangement, and combination of parts, as will be hereinafter described.

In the accompanying drawings, which form a part of this specification, the general form of machine shown is the Remington type-writer; but a skilled mechanic will readily apply my invention to any style of type-writing machine.

Figure 1 is a back view of the type-writer,

showing such parts as are necessary to illustrate my line-lock. The rear of the top plate is broken away at X X to more clearly show the release-lever for the line-lock. Fig. 2 is a sectional view of the type-writer with the frame cut away on the line Y Y of Fig. 1.

Mounted on the top plate 1 is the carriage 2, which is supported and movable endwise upon the front rail 3 and the rear rail 4. The spring-barrel 5 is connected with the carriage by a connecting-band and contains the mainspring, which constantly tends to draw the carriage from the left end of the rails to the right end, (viewing the machine from the rear.) At the rear of the carriage the rack-frame 6 and the rack 7 are mounted. The rack may be pivoted to the carriage, as is shown and described in my said Patent No. 580,281 and in my United States Patent No. 554,874, dated February 18, 1896, in Fig. 1 thereof, or it may be otherwise attached to the carriage or operatively connected therewith by any of the various means known to the art, since the particular form of escapement used is immaterial and constitutes no part of this invention. I have herein shown only such parts of the escapement as are necessary to properly illustrate my invention. Depending from the rear of the top plate are the brackets 8 and 9, between which the dog-carrying rocker-frame 10 is pivoted. The rocker-frame carries the independently-pivoted dog 11, which normally engages with the rack, and the detaining-dog 12, which is normally disengaged. At the base of the rocker-frame and extending horizontally toward the front of the machine is the arm 13, to which is attached the cross-bar 14. The cross-bar is attached by the connecting-wires 15 15 to the universal bar 16, which passes under all of the key-levers 17. The key-levers are in turn each connected by a wire 18 to the corresponding type-bars 19 19. When a key-lever is depressed, the corresponding type-bar is vibrated to the platen 20 to print, and simultaneously the spacing-dog 11 is disengaged from the rack 7 and the detaining-dog 12 engaged therewith. Upon the release of the key the type-bar falls back to its normal position, the spacing-dog is reengaged with the rack, and the carriage moves forward one space under the impulse of the mainspring. All of these parts are of the ordinary construction and operate in the usual manner.

On the upper end of the dog-carrying branch of the rocker-frame is the arm 21, which passes up above the rack-teeth and stands at the rear of the rack. The arm 21 normally stands at some distance back of the rack-bar. Upon depression of a key it is rocked in toward the rack-bar, but need not be rocked far enough to strike the rack. Mounted at the extreme left of the rack-bar is the line-lock lever 22. This lever is pivoted upon the stud 23 and can be vibrated

on the stud up and down. The portion of the lever extending to the right of the stud constitutes the line-lock stop 24, while the other end of the lever is formed into an independent release-key 25. As the line-lock stop 24 is heavier than the key 25, the line-lock end drops down, tilting the key upward. The pin 26 limits the downward movement of the line-lock stop and holds the lever in its normal position. When the carriage has been advanced sufficiently to bring the line-lock stop 24 into an obstructive position between the rack 7 and the arm 21 on the rocker-frame, the forward vibration of the rocker-frame is prevented. While the line-lock parts are in this position the spacing-dog cannot be disengaged from the rack by the stroke on the keys, the type-keys cannot be depressed, and the type-bars cannot be moved to the platen to print. By depressing the key 25, however, the line-lock stop 24 can be tilted up above the arm 21. The type-keys can then be depressed, the type-bars moved to the platen, and the spacing of the carriage effected.

I have also provided a more convenient means for tilting the line-lock stop up out of its obstructive position to unlock the type-keys. At the left-hand end of the top bank of keys (looking at the machine from the rear) is the independent line-lock-release key 27, mounted on the front end of the key-lever 28 and normally free from and out of engagement with the carriage. The key-lever 28 is pivoted on the rib 29 of the machine-frame and is normally held up by the spring 30. Extending from the key-lever 28 is the wire 31, which connects one end of the key-lever with the line-lock-tripping lever 32. The release-lever 32 is pivoted to the top plate 1 by the stud 33. The opposite end of the release-lever projects upwardly a little to the left of the rocker-frame. When the line-lock stop 24 is in position to obstruct the rocker-frame stop 21, its interfering end is immediately above the upwardly-extending end of the release-lever 32. On depression of the key 27 the release-lever 32 is actuated, and the line-lock stop 24 is thereby tilted up out of the path of the arm 21. The type-keys can then be depressed and the carriage spaced forward until the end of the line is reached.

In the construction which I show the line-lock lever 22 is pivoted on the carriage and the stop-arm 21 is mounted on the rocker-frame. It is of course obvious that the positions of these two parts may be reversed, the line-lock lever being pivoted on the rocker-frame and the fixed stop on the carriage, the one construction being the mechanical equivalent of the other. Furthermore, it is obviously not essential that either of the stops be directly attached to the carriage, as there are several parts in type-writing ma-

chines which are attached to or otherwise operatively connected with the carriage and which move in conjunction with the carriage. One of the line-lock stops may be mounted on either of these parts, and in the various type-writers in use it has been found convenient to locate the stop in a great variety of places. Thus, for example, in the United States Patent to A. T. Brown, No. 465,451, dated December 22, 1891, the stop is mounted on the barrel for the spring which drives the carriage, where it revolves with the spring-barrel as the carriage is advanced until the stop is brought into position for obstructing the escapement. It is also obvious that my invention is of wide application and that the details which I show may be considerably altered in the various forms of type-writing machines without departing from the spirit of my invention. I therefore do not limit myself to the details shown, and particularly I do not limit myself to combining my line-lock or my release-key with any particular form of spacing mechanism.

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

1. In a type-writer line-lock the combination of two movable stops whose paths are transverse of one another and intersect one another, whereby when the two stops are both brought to the intersecting point in their paths one of the stops hits the other, and means including an independent key for positively removing one of the stops out of the path of the other stop, substantially as described.

2. In a type-writing machine the combination in an escapement of a rocker-frame, a stop, means for moving the stop into position to obstruct the rocker-frame at a predetermined point, and means including an independent key for positively removing the stop out of the path of the rocker-frame, substantially as described.

3. In a type-writing machine the combination of an escapement, a carriage, a movable stop mounted on the carriage and advanced with the carriage into position to obstruct the escapement at a predetermined point, an independent key normally free from the carriage and means controlled thereby for positively removing the stop out of its obstructive position, substantially as described.

4. In a type-writing machine the combination of a rocker-frame which forms a part of the escapement, a line-lock stop on the rocker-frame, a carriage, a line-lock lever pivoted on the carriage and advanced thereby into position to obstruct the line-lock stop on the rocker-frame at a predetermined point, a key and means operated thereby for positively removing the line-lock lever out of the path of the line-lock stop, substantially as described.

5. In a type-writing machine the combination of spacing mechanism including a rocker-frame, a line-lock stop on the rocker-frame, a carriage, a line-lock lever pivoted on the carriage and provided with a line-lock stop on one end and a release-key on the opposite end, substantially as described.

6. In a type-writer line-lock the combination of two stops, one of the stops being mounted on a part moving with the carriage, the two stops being so positioned that upon the movement of the carriage, the carriage-stop is brought into position to obstruct the other stop while both the stops are in their normal positions, an independent key, and means operated by the key for moving one of the stops out of its normal position to release the line-lock, substantially as described.

7. In a type-writing machine the combination of spacing mechanism, a carriage, a stop attached to the spacing mechanism and moving therewith, a stop mounted on a part moving with the carriage and advanced therewith into the path of the stop in the spacing mechanism whereby the stop in the spacing mechanism is obstructed by the said stop which is advanced with the carriage, a key, and means operated by the key for moving the said stop which is advanced with the carriage out of the path of the spacing-mechanism stop to release the spacing mechanism, substantially as described.

8. In a type-writer line-lock the combination of two stops, one of which is mounted in the escapement and movable therewith and the other of which is moved with the carriage into position to obstruct the escapement-stop, a key, a line-lock releaser, and a connection between the key and the line-lock releaser whereby the releaser is controlled by the key, substantially as described.

9. In a type-writer line-lock the combination of two stops, one of which is mounted on the escapement rocker-frame, and movable therewith, and the other of which is mounted on the carriage and is advanced thereby into position to obstruct the rocker-frame stop, a key, a line-lock releaser, and a connection between the key and the line-lock releaser whereby the releaser is controlled by the key, substantially as described.

10. In a type-writer, the combination with a power-driven part and a key-driven part, of a stop movable on one of the said parts and brought by the movement of the parts into position to obstruct such movements of

the parts, an independent key normally free from the part carrying the stop and means controlled thereby for positively removing the stop out of its obstructive position, substantially as described.

11. In a type-writer, the combination with a power-driven carriage, of a power-driven stop and a key-driven stop, brought into obstructive position with each other on the movement of the carriage, an independent key normally free from the carriage and means controlled thereby for positively removing the power-driven stop from its obstructive position, substantially as described.

12. In a type-writing machine, the combination with an escapement mechanism, of a stop moved by the carriage into position to arrest the movement of the escapement mechanism, an independent key normally free from the carriage and means controlled thereby for positively removing the stop from its obstructive position, substantially as described.

13. In a type-writing machine, the combination of a carriage, spacing mechanism, a stop brought into position by the movement of the carriage to arrest the spacing mechanism and a line-lock-release key mounted on the carriage and operatively connected with said stop whereby the stop is positively disengaged from said spacing mechanism to permit further movement of the carriage, substantially as described.

14. In a type-writing machine the combination of an escapement, a carriage, a stop, means for advancing the carriage and for thereby moving the stop into position to obstruct the escapement at a predetermined point, and means including a key mounted on the carriage for removing the stop out of its obstructive position, substantially as described.

15. In a type-writer line-lock the combination of an escapement, two stops, one of which is mounted to be moved with the carriage into position to obstruct the other, a key, a line-lock releaser and a connection between the key and the line-lock releaser whereby the releaser is operated by the key, substantially as described.

Signed by me in New York city this 9th day of November, 1896.

FREDERIC W. HILLARD.

Witnesses:

SAMUEL W. BALCH,
J. M. MAY.