(No Model.) 2 Sheets—Sheet 1.

G. W. N. YOST.

TYPE WRITING MACHINE.

No. 456,350. Patented July 21, 1891.

Fig. 1.

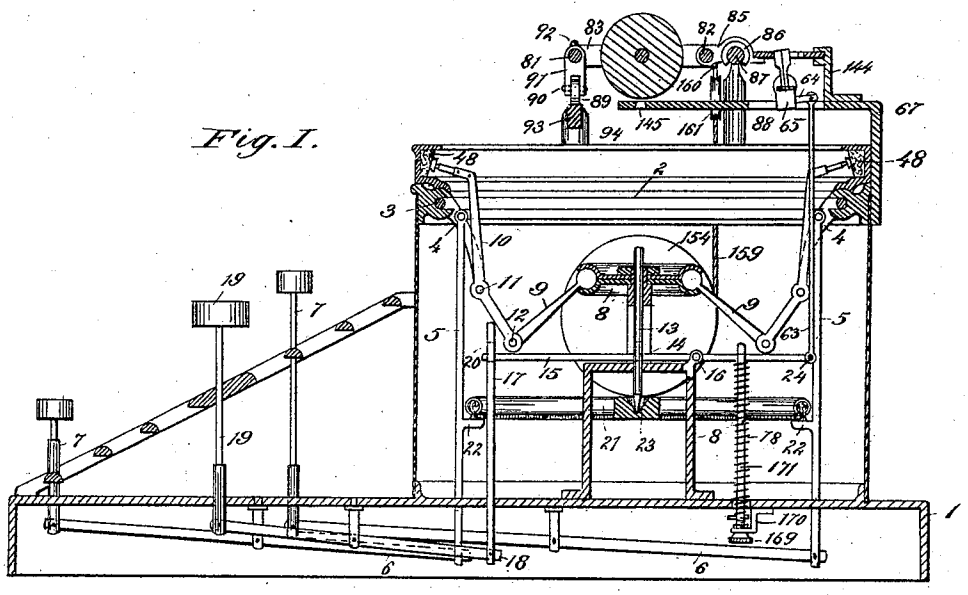


Fig. 2.

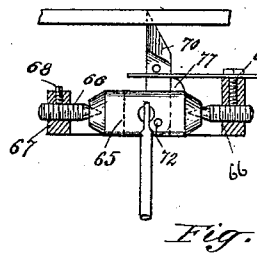


Fig. 3.

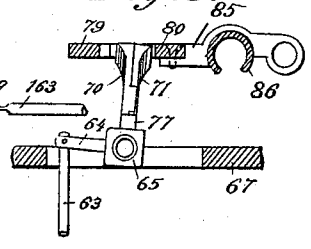


Fig. 4.

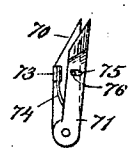


Fig. 5.

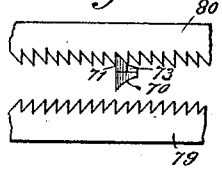


Fig. 6.

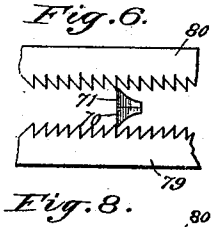


Fig. 7.

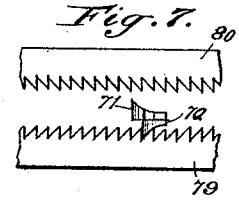
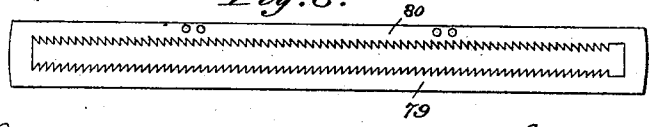


Fig. 8.



Attest:

Andrew O. Pierce.

Martin Cohen

Inventor:

George W. N. Yost

By Jacob Felbel

Atty:

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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G. W. N. YOST.

TYPE WRITING MACHINE.

No. 456,350. Patented July 21, 1891.

Fig. 9.

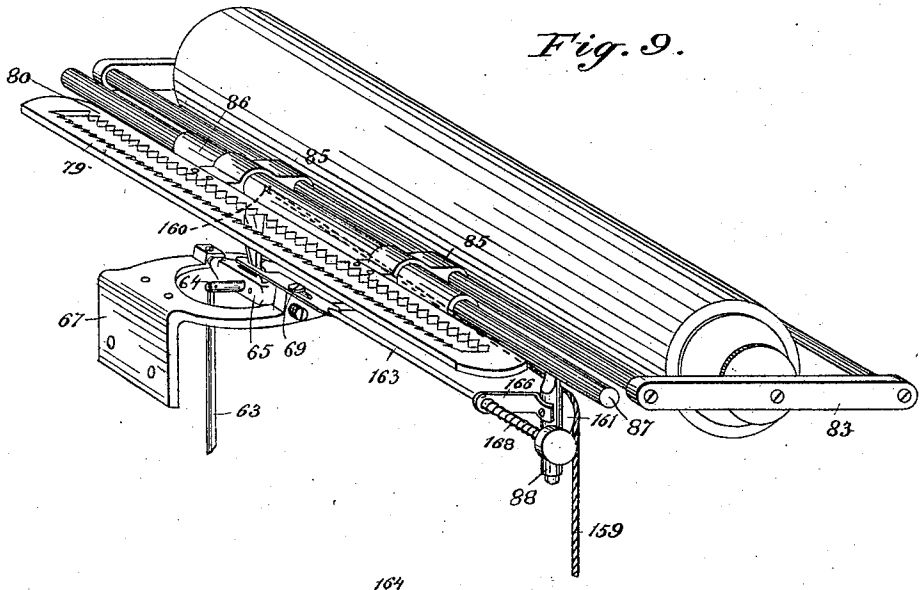


Fig. 10.

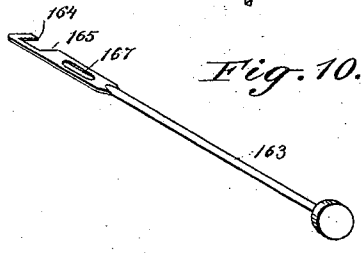
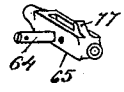


Fig. 11.



Attest:

Andrew B. Stiegen

Martin Cohen

Inventor:

George W. N. Yost

By Jacob Felbel

Atty:

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GEORGE W. N. YOST, OF NEW YORK, N. Y., ASSIGNOR TO THE DAVIDSON WRITING MACHINE COMPANY, OF SAME PLACE.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 456,350, dated July 21, 1891.

Application filed January 2, 1891. Serial No. 376,487. (No model.) Patented in England March 26, 1889, No. 5,136; in France March 26, 1889, No. 196,984; in Belgium March 26, 1889, No. 85,548; in Germany March 27, 1889, No. 51,365; in Italy March 30, 1889, No. 25,137, and in Spain May 11, 1889, No. 9,399.

To all whom it may concern:

Be it known that I, GEORGE W. N. YOST, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My present invention relates more particularly to the feed or letter-space mechanism for paper-carriages of type-writing machines, and has for its main object to provide a simple and effective construction; and it consists in the various combinations of devices hereinafter more fully described, and particularly pointed out in the appended claims.

This invention has been patented to me in the following foreign countries, to wit: Great Britain, March 26, 1889, No. 5,136; France, March 26, 1889, No. 196,984; Belgium, March 26, 1889, No. 85,548; Italy, March 30, 1889, No. 25,137; Spain, May 11, 1889, No. 9,399, and Germany, March 27, 1889, No. 51,365.

In the accompanying drawings, Figure 1 is a vertical longitudinal central section of a type-writing machine embodying my invention. Fig. 2 is a rear elevation, partly in section, of the escapement devices. Fig. 3 is an end view of the same. Fig. 4 is a side elevation of the feeding-dogs. Figs. 5, 6, and 7 illustrate the feeding operation. Fig. 8 is a plan view of the feed-rack. Fig. 9 is a perspective view of the paper-carriage and feeding devices, looking from the rear. Fig. 10 is a perspective view of the release-key detached, and Fig. 11 is a perspective view of the trunnion for supporting the feed-dogs.

In the various views the same parts will be found designated by the same numeral of reference.

1 designates the bed or base plate; 2, the type-ring or top plate, containing the fulcrum-ring 3, supporting a series of drive-links 4, to each of which is connected a rod 5, which passes down below the bed-plate and is connected to one end of a lever 6, whose opposite end is provided with a finger-key 7.

8 is a fulcrum-support arranged centrally of the machine, and 9 a series of guide-levers radiating therefrom.

10 are the type bars or carriers, pivoted at 11 to the lower end of one of the links 4 and at 12 to the outer end of one of the links or levers 9.

Guided in the central support 8 is a vertical spindle 13, through a slot 14, in which passes a horizontal lever 15, which is fulcrumed at 16 to the support 8, and which is connected at its outer end to a vertical link or rod 17, whose lower end is connected to a lever 18, having a spacing-key 19 at its forward end. The upper end of the link or rod 17 is slotted, as indicated at 20, to permit of the lever 15 being moved independently of the rod 17.

21 designates a circular universal bar, which rests normally upon offsets or fingers 22, projecting inwardly and radially from the connecting-rods 5. The center of the universal bar is provided with a conical depression 23, in which rests the lower conical end of the spindle 13. The rearmost end of the horizontal lever is pivoted at 24 to the lower end of a vertical rod or coupling 63, whose upper end is connected to an arm 64, projecting rearwardly from a rocking or oscillating bar or trunnion 65, centered or supported axially by conically-pointed screws 66, working in threaded holes in a support or plate 67, attached to the frame-work of the machine. When the screws 66 have been adjusted to properly pivot the trunnion 65, small vertical screws 68 and 69 are turned down to set them firmly in place.

The trunnion 65 is slotted vertically for the reception of the feed-dogs 70 and 71, which are pivoted therein by a pin 72. The dog 70 is provided with a flange 73, to which is attached a small flat spring 74, the lower end of which bears against the rear side of the dog 71 and tends always to throw the same toward the right of the machine. The spring-dog 71 may be formed with a slot 75 to receive a pin 76, projecting from the dog 70, by which means the throw of the spring-dog to the right may be limited. The flange 73 is intended to limit the movement of the spring-dog toward the left of the machine, although the pin and slot may be used for that purpose.

77 is a projection from the trunnion to brace

and support the dogs when they are vibrated to the left by the action of the carriage-driving mechanism.

78 is a spring mounted on a post attached to a bracket beneath the machine and employed principally to act on the feed-dogs, as hereinafter more fully explained.

The feed-rack, composed of two toothed bars 79 and 80, arranged in the same horizontal plane, engages with the feed-dogs 70 and 71. The dog 70 works in the teeth of the bar 79 and the dog 71 in the teeth of the bar 80. The double feed-rack is attached to and travels with the paper-carriage. The frame of the paper-carriage consists of a front rod 81 and rear rod 82 and right and left side bars or ends 83. The double rack is connected to the rear rod 82 by means of a hinge or strap 85, in practice arranged near each end of the carriage, which permits of the paper-carriage being turned up to a vertical position. To the under side of each hinge or strap 85 is attached an inverted grooved bar 86, which slides or travels on a round rail 87, secured to standards 88, projecting up from the top ring or plate 8. The grooved bar or slide 86 and the rail 87 support the rear side of the carriage and guide it in a right line in its travels across the machine. The front rod 81 of the carriage-frame is provided with a small wheel or roller 89, turning on a stud or axle 90 in a bifurcated bracket 91, secured in position on said rod by a set-screw 92.

93 designates a track or way upon which the wheel 89 travels and by which the front side of the carriage is supported, said track being attached to posts 94, projecting up from the top plate.

154 designates a spring drum or barrel provided with a grooved periphery, to which is connected one end of a cord or other device 159, whose other end is attached to the paper-carriage at the point 160, the direction of the cord being changed by one or more pulleys 161, over which the cord runs.

163 designates a horizontally-arranged release-key, the shank of which is formed or provided at its inner end with a notch or cut-away to form the shoulders 164 and 165, between which the feed-dogs 70 and 71 are arranged. The release-key is supported near its outer end in a bracket 166 and near its inner end by a holder 67, at which locality it is provided with a slot 167, through which the screw 69 passes, and by which it is retained in working position. Between the bracket 166 and the head of the release-key is arranged a spiral spring 168, operating to force said key to the left and hold the dogs 70 and 71 in a vertical position and in engagement with the duplex rack.

The tension of the spring 78 may be regulated by a screw 169, mounted in a bracket 170 on the under side of the bed-plate, which engages with a threaded hole in the rod 171, around which the spring is coiled loosely, its upper end pressing against the lever 15 and its lower end resting upon a cross pin or head at the lower end of the rod 171. By turning the screw 169 the rod 171 is caused to travel thereupon, and the spring is compressed or elongated, according to the direction of movement of the screw.

To begin writing, the carriage may be drawn to the right-hand side of the machine, thereby unwinding the cord 159 from the drum 154 against the tension of the spring thereon. During this movement the feed-dogs vibrate on their pivot 72, the dog 71 bobbing freely between the teeth of the rack 80. When the pull of the carriage by the operator is released, the dogs stand relatively to the rack in the position illustrated at Fig. 5 by reason of the action of the spring 78 and the driving power. If the finger-key 7 be depressed, the key-lever 6 will be vibrated on its fulcrum-post to raise the connecting-rod 5. The lug or offset 22 on the latter will at the same time raise that portion of the universal lever or wheel 21 on the side of said lug or projection, the opposite portion of said universal bar bearing upon the diametrically-opposite lug 22 as a fulcrum. As the connecting-rod 5 is pushed up it operates to lift the link or lever 4, which throws the type-carrier 10 and type from the pad to the type guide or directrix 145 and the platen 108, the link or lever 9 assisting in guiding or directing the carrier to said position. The type-face on leaving the pad or inking-surface 48, against which it and all the other type-faces normally stand, is given nearly a quarter-turn and is caused to print directly upon the paper on the under side of the platen. When the universal ring or lever 21 is elevated, it carries with it the vertical rod or spindle 13, which in turn raises the front arm of the lever 15, thereby depressing its rear arm against the tension of the spring 78 and pulling down the link 63, rocking the trunnion 65, and carrying the feed-dogs mounted thereon rearwardly. As the dogs are vibrated rearwardly from the normal position shown at Fig. 5 the dog 70 partially enters the space between two teeth on the bar 79 before the dog 71 leaves the teeth on the bar 80, as seen at Fig. 6, thus providing against any feed of the carriage while the printing is taking place, and hence avoiding any blurring of the impression, the combined width of the faces of the two dogs being slightly greater than the distance between the points of the teeth on the bars 79 and 80. When the dog 70 shall have fully entered between two teeth on the bar 79, (still holding the carriage,) the dog 71, having been rocked out of line with the teeth on the bar 80, is thrown to the right by the action of the spring 74 the distance of one tooth, as seen at Fig. 7. Upon releasing the pressure on the finger-key 7 the key-lever 6, the connecting-rod 5, the lever 4, the type-carrier 10, the link or lever 9, the universal ring or lever 21, the spindle 13, the lever 15, the link 63, and the trunnion 65, with its dogs, all return

by gravity and under the influence of the spring 78 to their normal positions, which are clearly shown in full lines at Fig. 1. During the return of the dogs 70 and 71 the dog 71 enters the next space or notch to the right of the one it formerly occupied, and immediately the dog 70 has left the bar 79 the carriage-propelling drum 154 partially winds the cord 159 upon itself and pulls or draws the carriage toward the left of the machine against the tension of the spring 74 the distance of one letter-space or notch. During this movement of the carriage the dog 71 is vibrated to the left by reason of its engagement with the bar 80 until it strikes against the lug or abutment on the dog 70, which latter now stands against the end of the slot in the trunnion and also against the lug 77, or at the limit of its vibration to the left. When the dog 71 has been carried against the lug 73 on the dog 70, the faces of the two dogs will be brought in line, as shown at Fig. 5, and the feed of the paper-carriage to the left will be stopped or interrupted. While the finger-keys connected with type-carriers are being operated, the space-key 19 remains motionless, the front arm of the lever 15 working loosely in a long slot in the upper end of the link 17.

Between the words the space-key is operated by depressing it in the manner of the other keys. When depressed, its lever is thrown upwardly at its rear end, and the link 17 is caused to elevate the front end of the lever 15 and depress its rear end against the spring 78, thus drawing down the link 63 and effecting the vibration of the dogs 70 and 71 in the manner hereinbefore described.

When it may be desired to feed the carriage quickly to the left, the release-key 163 is pushed in to vibrate the dogs 70 and 71 on their pivot 72 toward the right and out of engagement with and beneath the plane of the duplex rack, whereby the carriage is left free to be moved rapidly toward the left of the machine. Upon removing the pressure of the release-key the spring 168 will return the same and the dogs to their normal positions.

The duplex feed-rack is guided at its rear edge in a horizontal groove in a bracket 144, screwed to the support or plate 67, which extends forwardly and is formed with or has attached to it the type guide or directrix 145.

The type-carriers, the paper-carriage, and the paper-carriage-propelling mechanism may be greatly changed without departing from the spirit of my invention, which relates more particularly to the duplex rack and duplex dogs.

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

1. In a type-writing machine, the combination of the feed-rack composed of two toothed bars 79 and 80, arranged in the same horizontal plane with their teeth facing each other, and the two independently-movable dogs 70 and 71, arranged between said toothed bars, the whole operating in the manner described.

2. In a type-writing machine, the combination of the holder or support 67, the trunnion 65, the independent dogs 70 and 71, having a common pivot 72 within the trunnion, means for vibrating the same, and the paper-carriage provided with the duplex rack.

3. In a type-writing machine, the combination, with the duplex rack constructed as described, of the independent pivoted dogs 70 and 71, mounted in the trunnion 65, a spring 74, and means for limiting the vibration of the dog 71.

4. In a type-writing machine, the combination, with the duplex rack constructed as described, of the slotted trunnion 65, the independent dogs 70 and 71, pivoted thereon, a spring for throwing the dog 71 to the right, a stop for limiting its movement in that direction, and a stop for limiting its movement in the opposite direction.

5. In a type-writing machine, the combination, with the duplex rack constructed as described, connected at one edge to the paper-carriage and guided and supported at its other edge, substantially as described, of the trunnion 65, having the pivoted independent dogs 70 and 71, and means for rocking said trunnion.

6. In a type-writing machine, the combination of a duplex rack consisting of the horizontally-arranged bars 79 and 80, provided with oppositely-disposed teeth, the bar 80 being connected to the paper-carriage and the bar 79 guided and supported by a bracket, an oscillatory trunnion, the independent dogs 70 and 71, pivoted thereto, and means for rocking said trunnion.

7. In a type-writing machine, the combination, with the duplex rack constructed as described, of the slotted trunnion 65, the independent dogs 70 and 71, mounted thereon, and the spring-actuated release-key.

Signed at New York, in the county of New York and State of New York, this 31st day of December, A. D. 1890.

G. W. N. YOST.

Witnesses:
JACOB FELBEL,
GEO. W. WEIFFENBACH.