(No Model.) 2 Sheets—Sheet 1.

N. H. LAMB.

TYPE WRITING MACHINE.

No. 492,812. Patented Mar. 7, 1893.

Fig. 1.

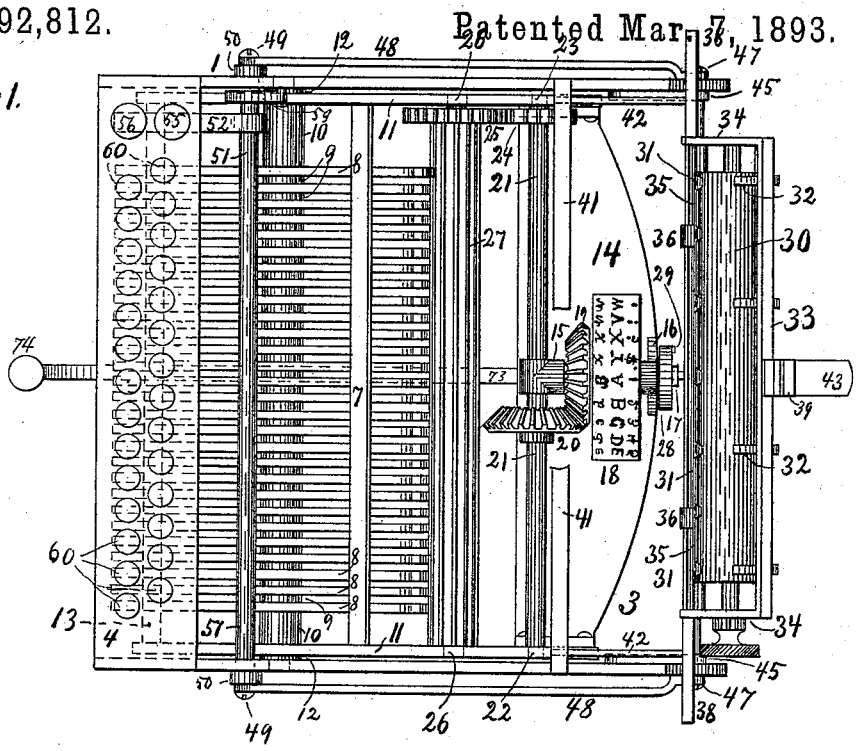
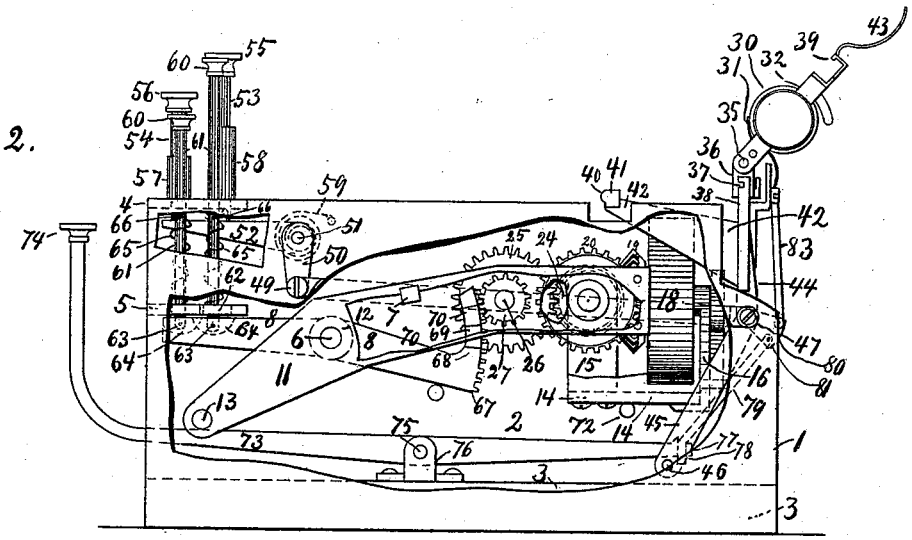


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

N. H. LAMB.

TYPE WRITING MACHINE.

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Fig. 4.

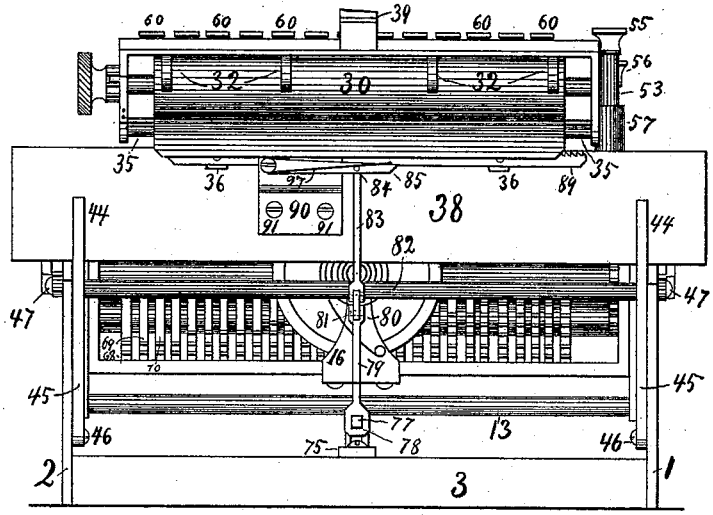
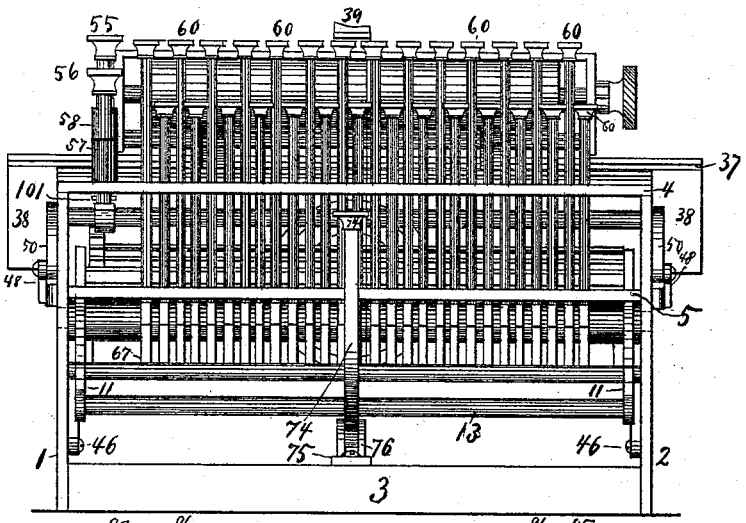


Fig. 3.



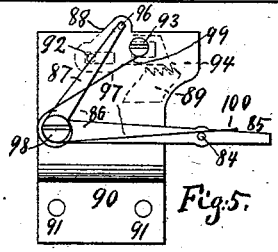


Fig. 5.

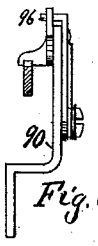


Fig. 6.

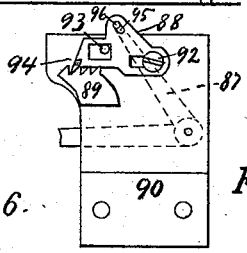


Fig. 7.

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UNITED STATES PATENT OFFICE.

NATHAN H. LAMB, OF VERDON, SOUTH DAKOTA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 492,812, dated March 7, 1893.

Application filed July 12, 1892. Serial No. 439,832. (No model.)

To all whom it may concern:

Be it known that I, NATHAN H. LAMB, a citizen of the United States, residing at Verdon, in the county of Brown and State of South Dakota, have invented certain new and useful Improvements in Type-Writing Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in typewriting machines.

The objects of my invention are: first, to provide a typewriter that cannot easily get out of order; second, to provide a typewriter of such simple construction that it can be sold cheaply and still possess the merits of a good, perfect machine of its class. I attain these objects by the novel construction and arrangement of parts illustrated in the accompanying drawings in which

Figure 1, is a top plan view of my complete machine. Fig. 2, is a side elevation of the machine with one large and one small opening cut through the right-hand side frame to enable a better viewing of the inside of the machine. Fig. 3, is a front view and Fig. 4, a rear view of the machine. Figs. 5, 6, and 7, are detail views of the spacing mechanism of the machine.

Referring to the different parts in the drawings by numbers of reference, 1, and 2, are the side frames of the machine, 3, is the bottom to which said side frames are secured; their upper portions are secured together at the front ends by the two broad horizontal bars or strips 4, and 5, and farther back is a shaft 6, and a bar 7, rigidly secured with their ends to the side frames. There are also other shafts for various purposes farther back in the machine that lend to the rigidity of the frame of the machine.

Upon the rigid shaft 6, is pivotally placed a series of tilting levers 8, between which are placed upon the said shaft 6, the washers 9, by which the levers are kept steady and at proper distance apart; upon both ends of the shaft 6, are placed long washers or tubes 10, outside of which are placed upon the shaft 6, the two large tilting levers 11, between which and the side frames 1, 2, are finally placed upon the shaft 6, the thin washers 12, which serve to form a clearing between the levers 11, and the frames 1, 2, and also to help to fill accurately the entire length of the shaft 6, between the side frames. The large tilting levers 11, are rigidly secured together at their front ends by a round bar 13, and at their rear ends by a broad metallic bar 14, thus forming a tilting frame 11, 13, 14, rocking or tilting on the shaft, or bar 6. Upon the broad bar 14, I provide two brackets 15, 16, in the upper ends of which I journal the ends of a short shaft 17, (see Fig. 1,) carrying rigidly secured upon it between the said brackets a printing or writing type wheel 18, provided upon its periphery with one line of raised letters of the small alphabet near the front edge of the wheel, and near the rear edge of the wheel is a line of raised numerals: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, and characters used for punctuation and abbreviations in writing. Between the said two lines there is a third line containing the capital letters of the alphabet. Upon the shaft 17, is further secured a miter gear 19, meshing with the miter gear 20, secured upon the shaft 21, which is journaled in the bracket 15, and with its two ends 22, 23, in the side pieces 11, of the tilting frame. Said shaft 21, is provided at its end 23, within the tilting frame, with a rigidly secured gear wheel 24, meshing with the gear wheel 25, secured upon and near one end of the shaft 26, journaled with its ends in the side pieces 11, of the tilting frame and carrying also a rigidly secured pinion or toothed roller 27, reaching from side to side of the tilting frame, or far enough for all the segmental shaped toothed front ends of the tilting levers 8, to engage with the teeth of said roller 27, and partly turn it when the levers are operated by the keys of the machine, as will presently be more fully described.

At the rear end of the shaft 17, is secured a light spring 28, of the clock spring type, with its outer end secured on a suitable pin 29, in the bracket 16. The function of this spring is to revolve the wheels 18, 19, 20, 24, and 25, back to their normal positions every time they have been turned forward by the

operating mechanism for bringing a certain letter or type upward to the printing point of the paper to be printed on. Said paper is placed against the surface of a rubber roller as 30, and held in position by springs 31, 32. The roller 30, is journaled in a frame 33, 34, which is hinged or pivoted at the ends of a round rod 35, secured to sliding blocks 36, which are notched into a groove 37, provided all along in the front side near the upper edge of the metallic strip or guide 38. The frame 33, 34, and roller 30, are all shown as in the thrown back position that they are placed in while paper is being placed in the machine; when the frame 33, is folded forward the lowest line or side of the roller over which the paper to be printed on is stretched, is held about one-fourth of an inch above and directly over the small alphabet on the wheel 18, and is held in that position by the hook 39, engaging and sliding under the front rib 40, of bar 41, which is secured near its ends to two brackets 42, projecting forward from, and at a right-angle with the guide strip 38. The arm or projection 43, is a handle for taking hold of the hook 39, to spring it into and out of engagement with the bar 41. The machine is provided with a suitable signal bell for signaling the approach of the end of each line printed, but said bell and operating mechanism for same, as well as the inked ribbon stretched from side to side of the machine and passing between the top of the types and the paper to be operated upon, being of old and well known construction, are not shown or described. Also the roller 30, swinging frame 33, 34, hook 39, and the spacing mechanism, Figs. 5, 6, and 7, for moving laterally and for revolving the roller 30, are old devices and are shown only as far as necessary for the purpose of explaining their connection with and operation by new parts and methods.

The guide strip 38, is secured to the upper ends 44, of the two upright arms 45, the lower ends of which are bent toward the front of the machine and pivotally secured to the side frames 1, 2, by the screws 46, directly below the wheel 18; this location of the pivots is preferred in order that when the guide strip 38, is swung back and forth to cause the line being printed to change from the one line of type to the other upon the type wheel 18, the distance between the said wheel and the roller 30, will change as little as possible.

The mechanism used for swinging the arms 45, strip 38, and thereby the roller 30, from one line of type to the other on the type-wheel is as follows: In the arms 45, are provided studs 47, extending through horizontal slots in the side frames of the machine; at the outer ends of said studs 47, are pivotally secured the rear ends of two horizontal rods 48. The front ends of said rods are pivoted at 49 to two cranks 50, secured one on each end of a rock shaft 51, journaled in the side frames 1, and 2. This rock shaft is also provided with a rigidly secured arm 52, upon which rest the lower ends of the stems 53, 54, of the press buttons or keys 55, 56.

57, 58, are tubes secured upon the plate 4; these tubes serve as guides for the stems 53, 54, to work in and by touching under the buttons 55, 56, and being of different heights will stop the downward pressing of the keys 55, 56, at such pre-determined points as will bring the roller 30, to come over the capital letters on the typewheel when the key 56, is pressed down, and direct above the numerals and characters when the key 55, is pressed down. When either of the said two keys has been depressed and is released the spring 59, returns the rock shaft 51, lever 52, and keys 55, 56, to their normal positions. To prevent the stems 53, 54, from being thrown up out of the tubes in which they slide, a pin 101, is driven through the stem below the plate 4, as shown in Fig. 3, or the stems may be provided with small heads below the said plate 4.

60, are two rows of keys, in the present instance twenty-eight in number; upon these keys are printed or marked the letters of the alphabet in such rotation as is most usual in type-writers; and also the numerals 1, 2, 3, &c., and characters corresponding to those on the typewheel 18, and so arranged that the numerals or characters placed on one key with a letter must come in one axial line on the wheel 18, so that if for instance, A, and 1, come in one axial line and X, and $, in another line, then A1 will be on one key and X$ on another key. The stems 61, of the keys 60, guide through holes in the plate 4, and slots or slotted holes 62, in the plate 5, as shown in dotted lines in Fig. 2. The lower ends of the stems 61, extend below the plate 5, where they are flattened, inserted and pivoted at 63, in grooves or slots 64, in the front ends of the levers 8, (see dotted lines in Fig. 2.)

65 are pushing coil springs encircling the stems 61, which standing with their lower ends upon the strip 5, and having their upper ends inserted in a hole 66, in the stem, tend at all times to hold the keys 60, in their normal, elevated position with the levers 8, bearing against the under side of the strip 5.

The segmental shaped toothed rear ends of the levers 8, are all of even depth or in a line with their lower corners 67, but need not be so with their upper corners or ends, as indicated in Fig. 2, where 68, 69, 70, are the upper ends of three of the segments. Those segments are provided with teeth which all commence at the lower end of the segments, but diminish in number from one side of the machine to the other, or in such relative order to the arrangement of the letters and characters on the wheel 18, that when the keys 60, are pressed down by the operator, the number of the teeth on the segment will engage with the pinion roller 30, and according to the number of teeth on the segment, revolve it more or less, thereby turning also the wheels communicating from same to the

type-wheel 18, until the desired letter, character or figure is turned upward toward the paper to be printed on. The exact adjustment of said turning of the wheels by means of the keys 60, is further regulated by filing a shade more or less off the top edges 70, of the levers 8, at the point where the levers touch the stopping bar 7, secured with its ends to the tilting frame 11. The pressure of the operator's fingers upon the keys 60, proceeds however, downward after the levers 8, have touched the bar 7, and regulated the revolution of the type-wheel. This further or last part of the stroke of the keys causes the rear portions 70, of the levers 8, to lift the bar 7, and thereby the rear portion of the tilting frame, 11, 14, thus throwing the type wheel 18, upward and causing it to print on the paper stretched on the roller 30; when the keys 60, are released the weight of the front portion of the tilting frame causes it to sink down to its normal position resting upon pegs as 72, (in Fig. 2.) secured in the side frames. Every time the rear end of the tilting frame is thrown upward the front end of it is swung downward causing the bar 13, to touch upon and depress the lever 73, of the spacing key 74, this spacing lever 73, is pivoted at 75, in a bracket 76, secured upon the bottom base plate 3, of the machine; the rear end 77, of said spacing lever is pivoted to, or in the present instance passed into a hole 78, in the lower end of a rod 79, the upper end of which is bifurcated, slipped over a solid bell crank lever 80, and secured thereto by a pivot 81, (shown in Fig. 2,) said bell crank lever 80, is pivotally secured or journaled upon a round shaft 82, secured with its ends in the arms 45. To the upper corner of the bell crank lever or arm 80, is pivoted a rod 83, the upper end of which is pivoted at 84, to the arm 85, of the bell crank lever 86, of which the upper arm 87, operates the dog 88, of the spacing mechanism, best shown in the rear view Fig. 4, and in the detailed views Figs. 5, 6, and 7, in which 89, is a rack bar secured to the sliding blocks 36, which slide on the guide strip 38, but are rigidly secured on the shaft 35, at the outer ends of which the arms 34, of the frame 33, 34, are pivotally secured.

90, is an offset bracket secured by screws 91, to the guide strip 38.

Upon two pins 92, 93, are placed the slotted holes of the dog 88, in the upper corner of which there is a small slotted hole 95, in which the angularly bent point 96, of the lever arm 87, engages; the pawl 88, has a ratchet tooth point 94, engaging with the teeth of the rack 89.

97, is a wire spring taken one turn around the fillister head of the screw 98, by which the bell crank lever 86, is pivotally secured to the bracket 90. The end 99, of the spring 97, engages with the screw head 93, while the other end 100, of the spring is bent over on the arm 85, of the bell crank lever, and tends at all times to press that arm downward. Every time the spacing lever 73, is operated, either by the bar 13, touching upon it, or by the key or button 74, used for longer spaces than those between each letter, the rods 79, 83, swing the bell crank lever 87, so as to lift the point 94, of the dog 88, out of one notch and move it back to above another notch in the rack 89,—the slots in the dog permitting of both vertical and lateral motion; when the lever 73, is released the spring 97, brings the pawl 88, down into the new tooth and pushes the rack 89, frame 33, 34, and the paper carried thereby along on the guide strip 38.

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

1. In a type writer and mounted in a suitable frame, the combination of the type wheel 18, having raised letters, numerals and characters arranged upon it, with the tilting frame 11—14, carrying the type wheel journaled in or upon its rear portion where it can reach the paper to be printed on, and having horizontal bars as 7, and 13, for key operated levers as 8, to act against in tilting the frame so as to throw the type wheel against the paper, and also to press down upon the spacing lever 73,; said spacing lever being pivoted near its middle and having its front end provided with a key as 74, for extra spacing and its rear end pivotally connected with a spacing mechanism for moving the paper sidewise, either by the operation of the spacing key 74, or by the regular writing keys 60; means for holding the paper in position to the wheel and means for turning and returning the type-wheel 18, substantially as shown and described and for the purpose specified.

2. In a typewriter, the combination of the typewheel 18, having one circular row or line of capital letters near or at the center of its face and upon one side of the line of capital letters one line of small letters and at the other side a line containing numerals and characters used in printing or writing; the tilting frame 11, 14, brackets 15, 16, shaft 17, retraction spring 28, miter gears 19, 20, shaft 21, gear wheels 24, 25, long pinion 27, segmental shaped toothed levers 8, keys 60, pivoted to said levers 8, the springs 65, the guiding and stopping strips 4, and 5, the tilting frame 11, 14, the shaft 6, on which said tilting frame is fulcrumed, the cross bar 7, and 13, the key 74, levers 73, bracket 76, pivot 75, rod 79, bell crank lever 80, rod 83, and spacing dog 88, operated thereby, with the keys 55, 56, lever 52, spring 59, rock shaft 51, cranks or arms 50, rods 48, swinging arms 45, the guide board or strip 38, secured thereto, guide blocks 36, guiding in a groove as 37, and extending partly down at the back of the strip 38, so as to carry a rack as 89, for the spacing dog 88, to engage with and move the blocks 36, the shaft 35, rigidly secured in said blocks 36, the swinging frame 33, 34, pivotally secured at the ends of shaft 35, the brackets 42, carried by the guide 38, the bar 41, carried by said brackets, the hook 39, for

engaging with said bar 41, the handle 43, for manipulating said hook and frame 33, 34, the roller 30, and means for holding the paper in position upon said roller. Substantially as shown and described and for the purpose set forth.

3. In a typewriter, the combination with the typewheel 18, brackets 15, 16, shaft 17, retraction spring 28, miter or bevel gears 19, 20, shaft 21, gear wheels 24, 25, shaft 26, and long pinion 27, with the levers 8, having segmental shaped ends provided with larger and smaller numbers of teeth according to the predetermined part of a revolution each lever is to give to the pinion 27, when the operator swings each lever into gear with the pinion, for turning the desired letter of the typewheel into position for printing on the paper and means for operating said levers 8, substantially as and for the purpose set forth.

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

NATHAN H. LAMB.

Witnesses:
E. H. SNOWDEN,
H. L. NEMEYER.