(No Model.) 2 Sheets—Sheet 1.

# J. B. HAMMOND.

## TYPE WRITING MACHINE.

No. 458,260. Patented Aug. 25, 1891.

*Fig. 1.*

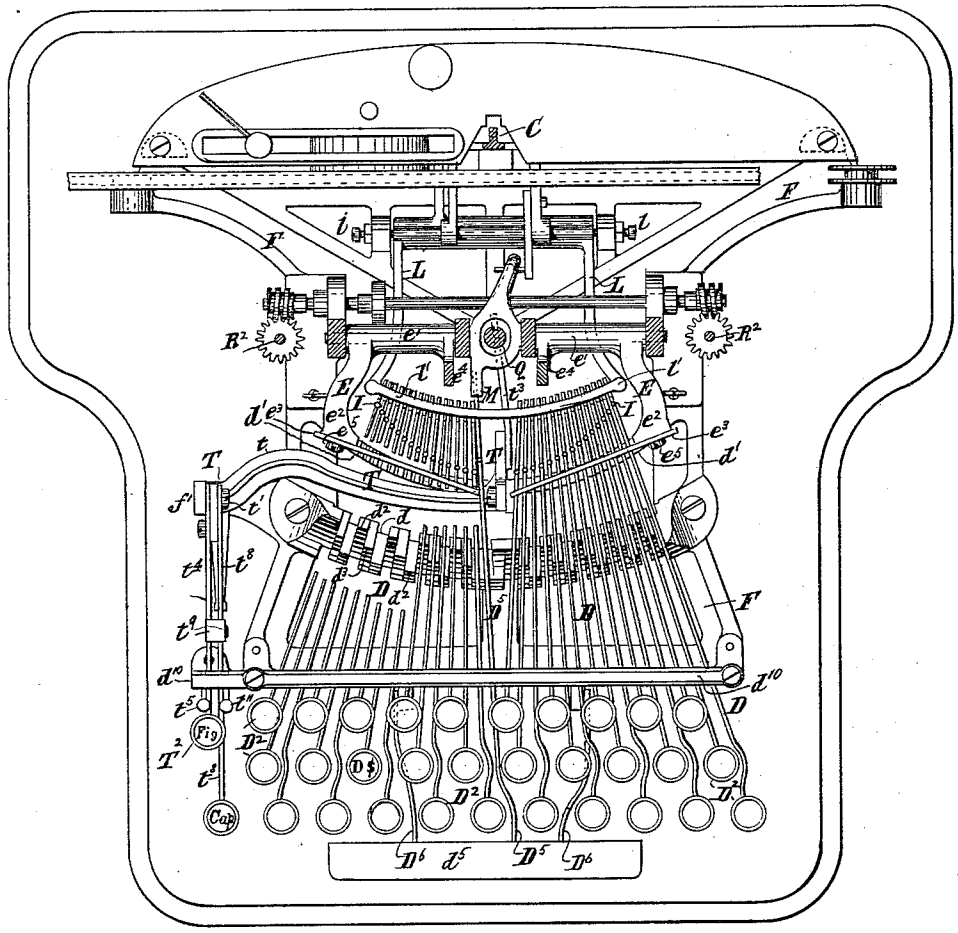
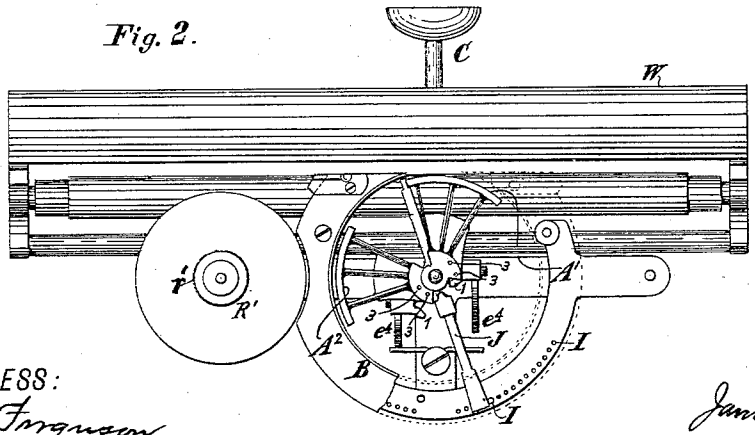



*Fig. 2.*




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(No Model.) 2 Sheets—Sheet 2.

# J. B. HAMMOND.

## TYPE WRITING MACHINE.

No. 458,260. Patented Aug. 25, 1891.

*Fig. 3.*

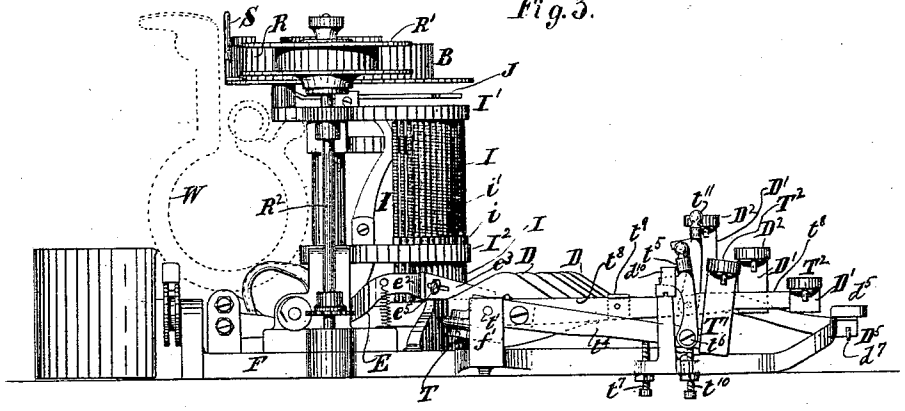



*Fig. 4*

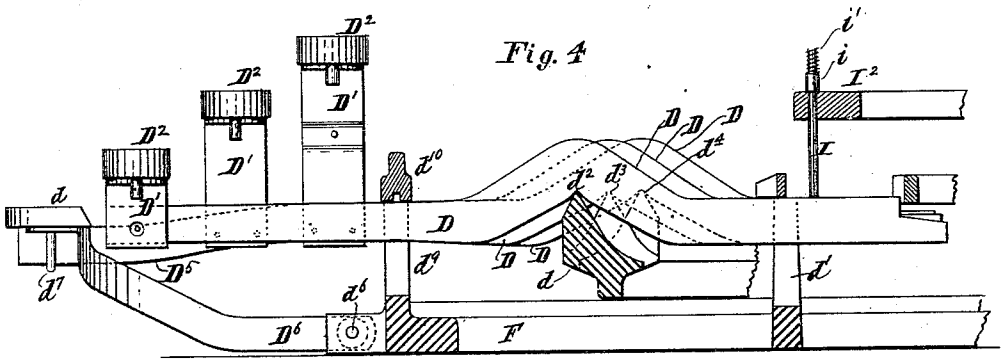



*Fig. 6.*

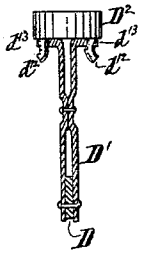



*Fig. 9.*

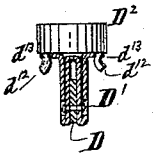



*Fig. 5.*

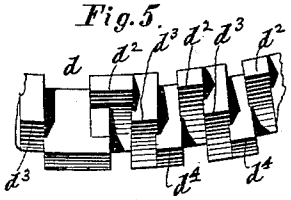



*Fig. 10.*

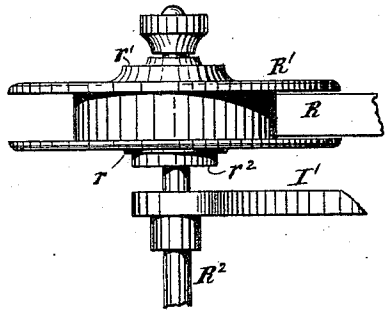
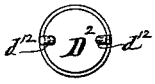



*Fig. 7*




*Fig. 8*




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# UNITED STATES PATENT OFFICE.

JAMES B. HAMMOND, OF NEW YORK, N. Y.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 458,260, dated August 25, 1891.

Application filed April 21, 1890. Serial No. 348,828. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES B. HAMMOND, of New York, in the county and State of New York, have invented a certain new and useful Improvement in Type-Writing Machines, of which the following is a specification.

I will describe my improvement in connection with a type-writer of the kind which has heretofore been put upon the market as the "Hammond" type-writer, and after doing so I will point out the novel features in claims.

In the accompanying drawings, Figure 1 is a horizontal section of a type-writer embodying my improvement. Fig. 2 is a sectional top view of certain parts of the same which do not appear in Fig. 1. Fig. 3 is a side view of the principal parts of the type-writer. Fig. 4 is a vertical section of certain parts of the type-writer, taken parallel with the side of the machine and made on a larger scale. Fig. 5 is a top view of a portion of a fulcrum-bar comprised in the machine, this view being made to the same scale as Fig. 4. Fig. 6 is a sectional elevation of one of a number of fingers and an attached finger-piece. Fig. 7 is a top view of the finger shown in Fig. 6. Fig. 8 is a bottom view of the finger-piece shown in Fig. 6. Fig. 9 is a view similar to Fig. 6 of another of the finger-pieces. Fig. 10 is an enlarged elevation of certain parts.

Similar letters and figures of reference designate corresponding parts in all the figures.

A' $A^2$ designate two type-wheels or type-wheel segments arranged within a cylinder B, having an opening, rearward of which are arranged an inking-ribbon R, a shield S for the ribbon, provided with a hole opposite the axis of the type-wheels or segments, and a holder for paper upon which writing is to be done. Rearward of the hole in the ribbon-shield a hammer C is arranged. The type-wheels or segments are provided with different letters of the alphabet and other symbols which are to be printed. There are several rows of the letters and symbols arranged one above another on the type-wheels or segments. Provision for a vertical movement of the type-wheels or segments is afforded to enable any row of letters or symbols to be presented in a horizontal plane, which will enable them to be one at a time presented in a position opposite the hole in the ribbon-shield and the hammer. The type-wheels or segments are adjustable rotarily to present the letter and symbols of any given row one at a time in a position opposite the hammer. The hammer forces the paper upon which the writing is to be done against the inking-ribbon and the latter against a letter or symbol presented opposite the hole in the ribbon-shield. The paper is secured in a carriage W, which is moved in a direction parallel with the front of the machine and moved longitudinally by means of rollers, which are journaled in the carriage. The inking-ribbon R is made of more than sufficient width to ink any letter or symbol upon either type-wheel or segment. It is supported by two spools R', upon which it is wound at the ends and upon either of which it is wound up to draw it along in order to present fresh portions to the type-wheels or segments. The spools R' are arranged upon shafts $R^2$, which have a slow rotary motion during the operation of the machine. The spools rest upon collars $r^2$, which are affixed to the shafts $R^2$. The spools may be clamped upon the shafts by expanding within them any suitable clamping devices attached to the shafts. There is nothing new at the present time in the means for fastening the spools to their shafts or for driving these shafts. Hence I will not further explain the devices employed for these purposes. It will be seen that the spools have on one side bosses $r$ of very slight projection and at the other side bosses $r'$ of considerably greater projection. This construction is important, because it enables the spools to be turned upside down to present the ribbon in different planes to the type-wheels or segments, and thus offer fresh surfaces for use.

D designates a number of key-levers or finger-keys. They are fulcrumed between their ends upon a bar $d$. At the rear ends they extend through slots in a bar $d'$, and at the forward ends through slots in a bar $d^9$. The bars $d'$ $d^9$ may be made integral with the base-frame F of the machine; but the bar $d$ may be more advantageously made separate and secured thereto. A bar $d^{10}$ extends across the top of the bar $d^9$, thereby securing the key-levers in place. The front ends of the key-levers D extend to different points and are provided with upright fingers D', having

at their terminals finger-pieces $D^2$. The operator depresses the forward ends of these levers by manipulating the finger-pieces.

E designates levers, which are operated by the key-levers D and serve to impart rotary motion to the type-wheels or segments. They consist, as here shown, of a rock-shaft $e'$, arms $e^2$, extending forwardly therefrom, arms $e^3$, extending horizontally toward each other obliquely across the rear end portions of the key-levers D and upright arms $e^4$, which terminate at the upper extremities in fingers 1 that engage with pins 3 on the hubs of the type-wheels or segments to impart rotary motion to the latter. The arms $e^3$ of each of the levers E extend over but one-half of the key-levers, and the upright arm $e^4$ of each lever E operates solely upon one of the type-wheels or segments. The rock-shaft $e'$, the arms $e^2$, and the arms $e^4$ of each lever E are shown as being made integral; but the arm $e^3$ of each lever is detachably connected with the arm $e^2$ thereof. As here shown, each arm $e^3$ is longitudinally slotted and is secured to the arm $e^2$ by means of a screw $e^5$, whose body passes through the slot and engages with a hole in the arm $e^3$. By thus detachably connecting the arms $e^3$ to the arms $e^2$ of the levers E provision is afforded for adjusting the arms $e^3$ into the best possible position to coact with the key-levers.

The key-levers not only serve to impart movement to the type-wheels, but also to operate devices whereby the positions in which the type-wheels shall come to rest will be determined. For the latter purpose their rear end portions extend under a number of vertical stop-pins I so as to raise the latter when the forward extremities of said key-levers are depressed. These stop-pins are arranged in an arc of a circle concentric with the axis of the type-wheels or segments, and they slide through two sector-shaped frames $I'$ $I^2$, which are beneath a base-flange with which the cylinder B is provided. Between the frame $I'$ and collars or shoulders $i$, with which the stop-pins I are provided, springs $i'$ are coiled around the stop-pins. These springs serve to depress the stop-pins, so that they will bear upon the rear portions of the key-levers. Whenever a key-lever is manipulated its rear end will not merely operate one of the levers E to impart rotary motion to the corresponding type-wheel or segment, but will also raise one of the stop-pins I, so that it will project in the path of a stop-lever J. This stop-lever J is fulcrumed between its ends coincidently with the axis of the type-wheels or segments. Its forward arm projects over the frame $I'$, so that when moved it can be arrested by any one of the stop-pins I, which may be raised, and its rear end obtrudes in the way of those ends of the type-wheels which are advanced to bring any letter or symbol arranged thereon opposite to the hammer C. It will be evident from this explanation that whenever the stop-lever is arrested by a stop-pin, the type-wheel which shall up to that time have been moving will have its motion arrested.

It will be seen that the key-levers converge rearwardly. This arrangement is due to the close proximity with which the stop-pins are located relatively to one another. They are not here shown as arranged to converge all to one point, but in two groups converging toward two different points. By this arrangement of the key-levers they may be separated sufficiently well at the front ends and yet brought within a small compass at the rear ends. I have shown some of the levers bent to one side at the forward ends for the purpose of securing the best possible arrangement between the three rows of finger-pieces.

It will be seen that because the front ends of the key-levers terminate in three rows there is formed a key-board comprising three rows of finger-pieces. As the fingers $D'$ supporting these three rows of finger-pieces are of different lengths, the three rows of finger-pieces are of different heights. The key-levers may be said to consist of three series or sets. To equalize the leverage as far as practicable, the bar $d$ has fulcra in three different vertical planes. As here shown, the fulcra are of inverted-V form and the key-levers are notched on the under side to fit upon such fulra. To avoid weakening the levers by the notches they may be bent or extended upwardly opposite the notches to conform in outline with the notched under sides of the levers. The fulcra or knife-edges, which are in three different planes, are marked $d^2$ $d^3$ $d^4$. It will be seen that the bar $d$ is curved longitudinally and that the apices of the fulcra $d^2$ are in one curved line or plane, the apices of the fulcra or knife-edges $d^3$ are in another curved line or plane, and that the apices of the fulcra or knife-edges $d^4$ are in still another curved line or plane. The extension of the bar $d$ and fulcra $d^2$ $d^3$ $d^4$ in a curve is advantageous owing to the convergence of the key-levers.

The carriage W is moved in the direction of its length by a spring in the usual manner. The means for controlling its movement are so well known that I have not illustrated them in detail.

L designates a lever made in the form of a frame and fulcrumed at the rear end by pivots $l$. At the front of this frame-like lever there is a cross-bar which extends above the rear portions of the key-levers D. Hence every time one of the key-levers is manipulated the lever L will be rocked upward. When so moved upward, the lever L effects the release of the carriage and the carriage moves the distance required to properly present the paper to receive another letter or symbol. A lever $D^5$, fulcrumed to one of the knife-edges $d^2$, extends rearwardly beneath the bar $l'$ of the lever L. This lever may be depressed at the forward end to effect the release of the carriage for spacing between words or sentences. Attached to the forward end of the

lever $D^5$ is a bar $d^5$, which extends parallel with the front of the front row of finger-pieces and for so long a distance as may be desired. The rear end of this lever $D^5$ also extends under one arm of a lever M, which serves to prevent the hammer from operating at such times as the movement of the carriage is effected merely for spacing between words or sentences. This lever M is of ordinary construction. Hence I do not regard it as necessary to illustrate all the parts which coact therewith to preclude the operation of the hammer during movements of the carriage made for spacing between words and sentences. The bar $d^5$ is supported not only by the lever $D^5$, but also by two arms $D^6$, which are pivoted by pins $d^6$ to the base-frame F of the machine and are fastened by screws or otherwise to the under side of the said bar. Preferably the bar $d^5$ will not be attached to the lever $D^5$, but will rest upon it. A wire $d^7$ may be fastened to the under side of the bar $d^5$ to extend downward and laterally in the form of a hook beneath the forward extremity of the lever $D^5$, so as to preserve the proper relations between the latter and said bar.

I will now explain the means whereby the type-wheels or segments may be elevated to present their different rows of letters and symbols into position for use. The hubs of the type-wheels or segments fit upon and are supported by an upright shaft Q. Under this extends a bent lever T, consisting of an arm $t$, extending widthwise of the machine and fulcrumed by a screw $t'$ to an upward extension $f'$ upon the base-frame of the machine. From the lever T an arm $t^3$ extends rearwardly beneath the lower extremity of the shaft Q. To the arm $t$ of the lever T an arm $t^4$ is rigidly attached. This arm extends forwardly and has at its front extremity an upwardly-extending finger and a finger-piece attached thereto. The finger and finger-piece may be like the fingers and finger-pieces of the key-levers. On the finger-piece $T^2$ of the arm $t^4$ I mark the letters "Fig." to indicate that by depressing this arm the type-wheels or segments will be elevated to a position which will bring the figure marked thereon in the same plane as the hammer C. A detent $t^5$ is pivotally connected at its lower end by a screw $t^6$ with the forward portion of the arm $t^4$, and has near the upper end a hook, which may engage with a hole in the bar $d^{10}$. It will be readily understood that the arm $t^4$ may be depressed and retained in this depressed position to enable the figures on the type-wheels or segments to be used by merely swinging the detent $t^5$ forward or lengthwise of the arm to engage with the bar $d^{10}$ after the arm $t^4$ shall have been properly depressed. A stop $t^7$, consisting of a screw fitted in a tapped hole in a portion of the frame F and projecting upwardly under the arm $t^4$, may limit the downward movement of the arm $t^4$. Such stop may of course be adjusted as may be desirable. The shaft Q is lowered by a spring in a well-known manner when released. The arm $t$, extending alongside of and normally on a level with the arm $t^4$ and of the lever T, has also affixed to it an arm $t^8$, which at the forward end is provided with a finger and finger-piece similar to the corresponding parts of the key-levers. This arm $t^8$ is not, however, rigidly connected to the arm $t$ of the lever T, but is pivotally connected thereto by the screw $t'$, upon which the lever T is fulcrumed. This arm $t^8$ is provided with a laterally-extending lug $t^9$, which projects over the arm $t^4$ of the lever T. Hence if the arm $t^8$ be depressed it will effect the depression of the arm $t^4$, and consequently cause an oscillation of the lever T and a raising of the type-wheels or segments. There is a stop $t^{10}$ for limiting the depression of the arm $t^8$ of the lever T, and this stop will preferably be made and fitted in place like the stop $t^7$. The stops $t^7$ $t^{10}$ are so arranged that the arm $t^8$ of the lever T cannot be depressed as far as the arm $t^4$ of said lever. When the arm $t^8$ is depressed, it will elevate the type-wheels or segments, so as to bring another row of letters or symbols opposite the hammer C. In the present instance it is intended that capital letters shall be brought into operation by the depression of the arm $t^8$ on the lever T. Hence the finger-piece of this arm is marked with the letters "Cap." A detent $t^{11}$ is pivoted at the lower extremity to the arm $t^8$ and provided near the upper end with a hook, which when said arm is depressed may be pushed lengthwise of the arm and engage with a hole in the bar $d^{10}$, so as to hold the said arm depressed, and consequently maintain the type-wheels or segments in position for the continued use of capital letters.

In my type-writing machine the type-wheels or segments are removable from the shaft Q, whereby they are supported, and therefore others having different styles of letters may be substituted for them at will.

To provide for substituting different letters and symbols upon the key-levers D, so that the letters and symbols upon the key-levers may be made to correspond with those upon the type-wheels or segments, I preferably detachably connect the fingers $D^2$ with the key-levers. A convenient means of doing this consists in forming the fingers of pieces of sheet metal riveted or otherwise secured to the key-levers and extended upwardly to form pairs of resilient strips having the upper extremities turned laterally and provided with notches $d^{13}$, and to form the fingers in the shape of buttons having pins $d^{12}$ extending from the under side and so disposed as to be able to engage with the notches in the laterally-turned extremities of the pairs of strips forming the fingers. Preferably the pins may be bent laterally to a slight extent, so as to be the more readily slipped into the notches.

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

1. In a type-writer, the combination of type-wheels or segments, a vertically-movable shaft upon which they are mounted, a lever for imparting vertical movement to said shaft, an arm secured to and extending forwardly from said lever, and another arm having a pivotal connection with the lever adjacent to the pivotal support of the lever and first-named arm, both of said arms extending forwardly side by side and normally on the same level, and the last-named arm having a projection extending over the first-named arm, substantially as specified.

2. In a type-writer, the combination of type-wheels or segments, a supporting-shaft therefor, a lever for imparting vertical movement to the supporting-shaft, arms extending forwardly from said lever, and a pivoted detent for each of said arms, the said detents having a movement lengthwise of the arms to engage with a portion of the machine-frame, substantially as specified.

3. In a type-writer, the combination, with the type-wheels or segments, the lever, and the arms extending forwardly therefrom, of detents pivoted to the arms and movable in the direction of the length of the arms to engage with a portion of the frame, substantially as specified.

4. In a type-writer, the combination of the type-wheels or segments, the single curved row of stop-pins therefor, the key-levers arranged in two groups and converging rearwardly and having their forward ends provided with finger-pieces arranged in straight parallel rows, levers intermediate of the type-wheels or segments, and key-levers and arms extending from the levers horizontally toward each other and obliquely across the rear end portions of the key-levers, substantially as specified.

5. In a type-writer, the combination, with type-bearers and an inking-ribbon, of spools for the ribbon mounted upon rotary shafts, the said spools having bosses on the opposite sides, the bosses on one side having a greater projection than the bosses on the other side, whereby when the spools are reversed a different plane of the ribbon will be presented to the type, substantially as specified.

6. In a type-writer, the combination of type-wheels or segments, key-levers, and levers E intermediate of the key-levers and type-wheels or segments and having detachable adjustable arms $e^3$, substantially as specified.

7. In a type-writer, the combination of type-wheels or segments, key-levers, and levers E intermediate of the key-levers and type-wheels or segments and having arms $e^3$, provided with longitudinal slots and secured to the contiguous arms of said levers by means of screws passing through said slots, substantially as specified.

8. In a type-writer, the combination of a number of key-levers, pairs of resilient strips connected to the key-levers and terminating at their upper ends in laterally-extended flanges, and finger-pieces detachably connected with said flanges, substantially as specified.

9. In a type-writer, the combination of a number of key-levers, pairs of resilient strips connected to the key-levers and terminating at their upper ends in laterally-extended flanges, and finger-pieces having pins or wires engaging with notches in said flanges, substantially as specified.

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