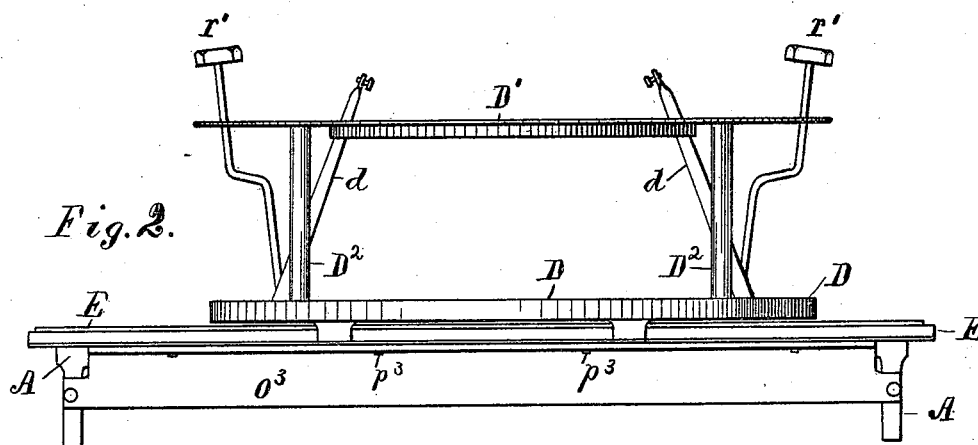
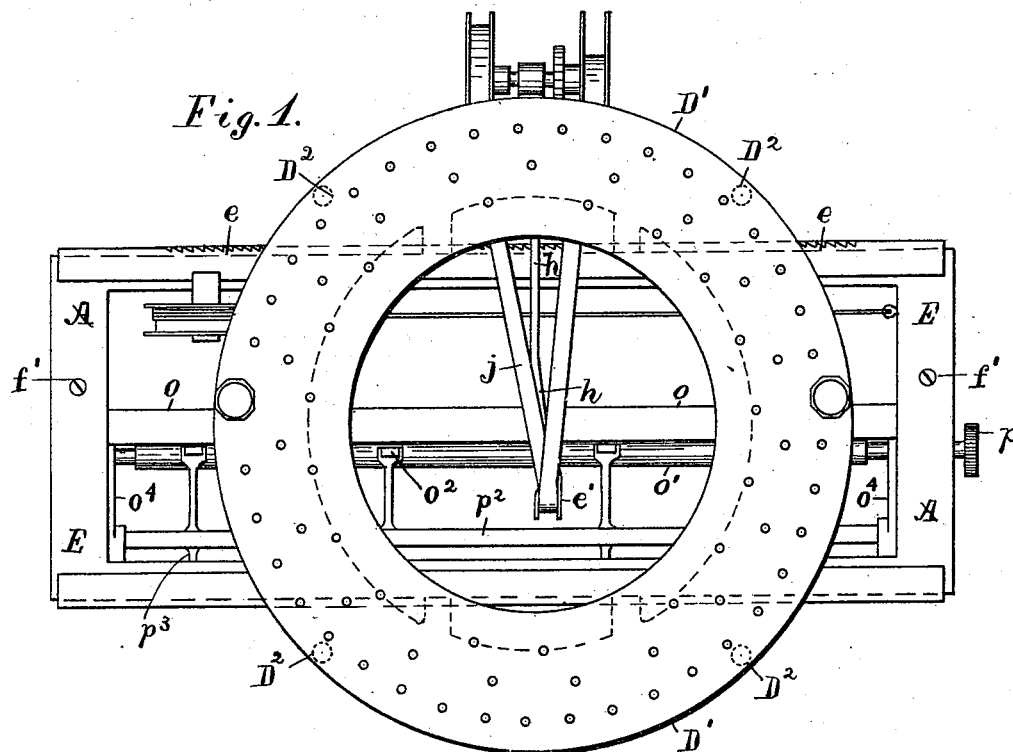


J. M. CRARY.
TYPE WRITING MACHINE.

No. 493,016.

Patented Mar. 7, 1893.



Attest:
Edward E. Smita
Edward E. Smita

Inventor.
Joseph M. Crary, per
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(No Model.)

5 Sheets—Sheet 2.

J. M. CRARY.
TYPE WRITING MACHINE.

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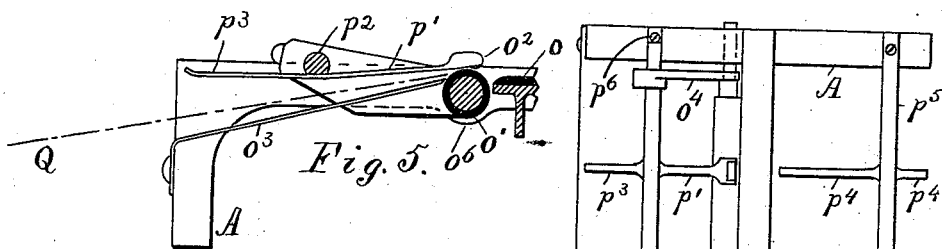


Fig. 6.

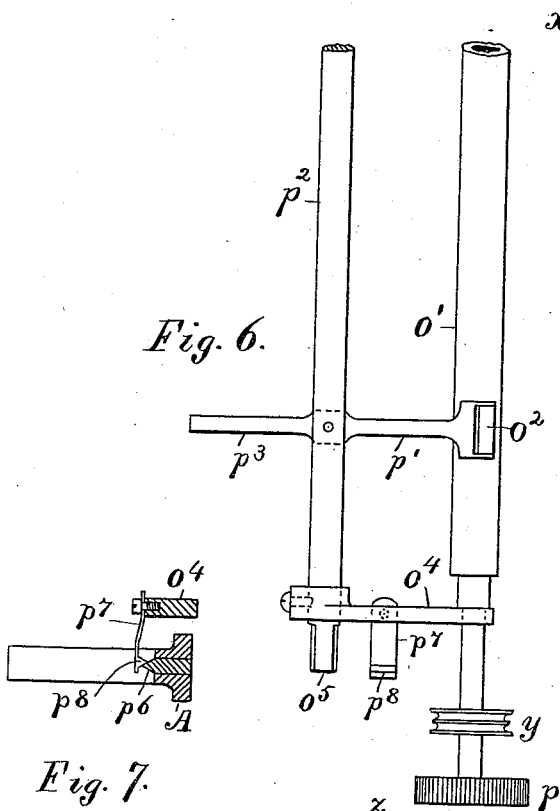


Fig. 7.

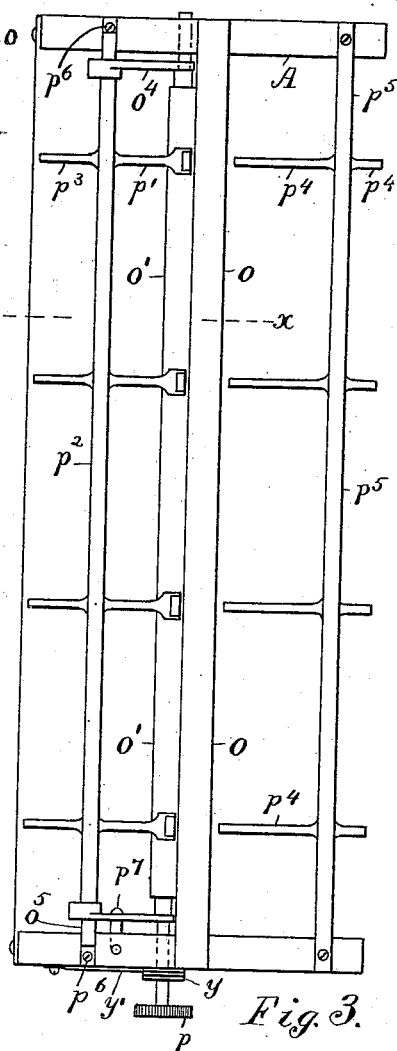
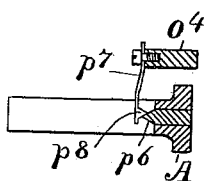


Fig. 3.

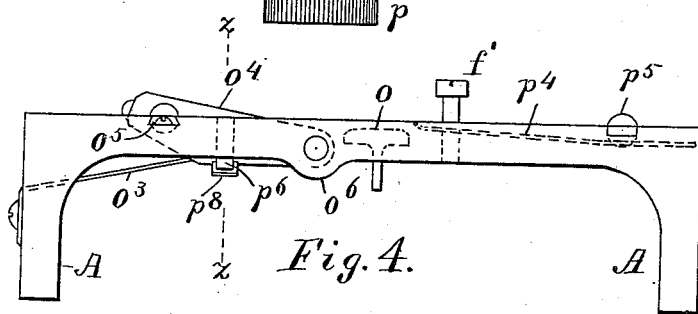


Fig. 4.

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Joseph M. Crary, per
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(No Model.)

5 Sheets—Sheet 3.

J. M. CRARY.
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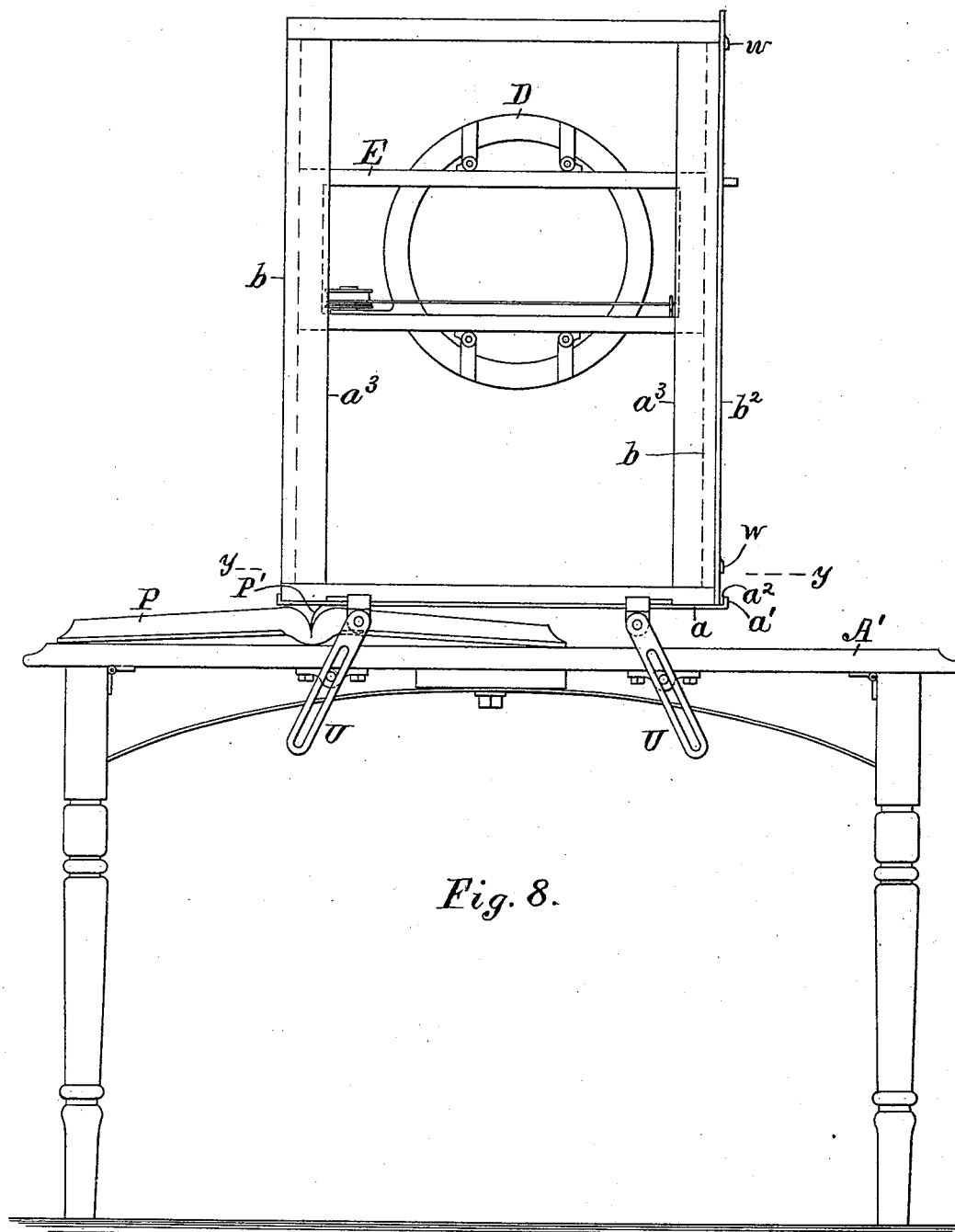


Fig. 8.

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Fig. 9.

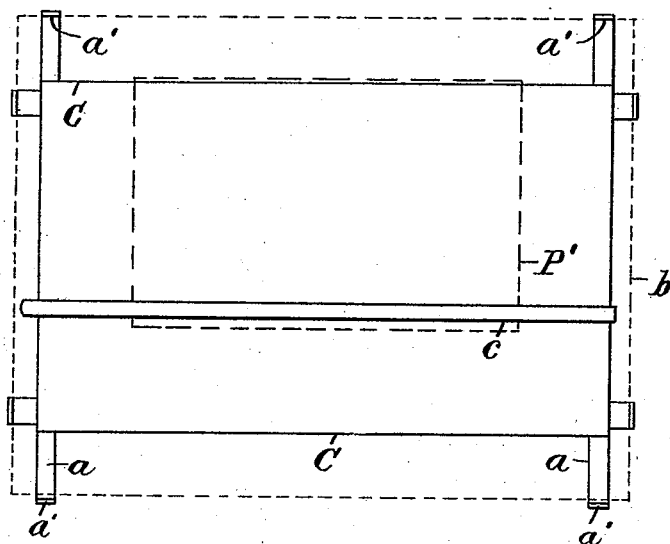


Fig. 10.

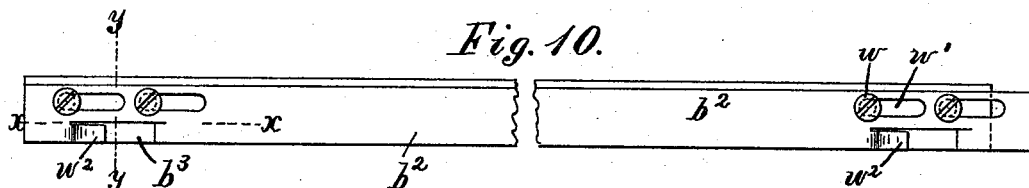


Fig. 11.

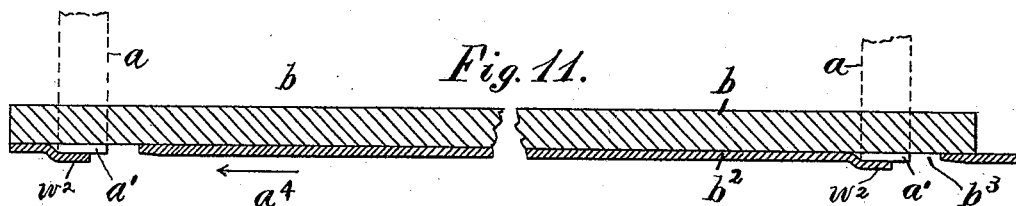


Fig. 12.

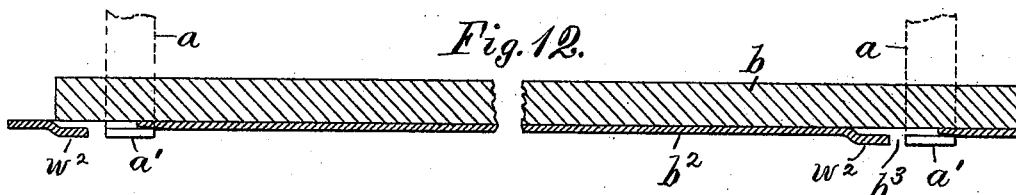
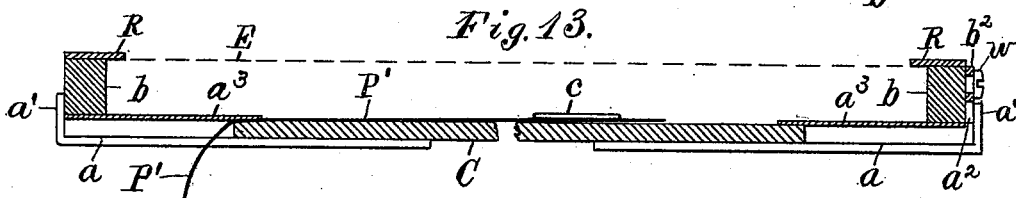


Fig. 13.



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Edw. F. Kinsey.

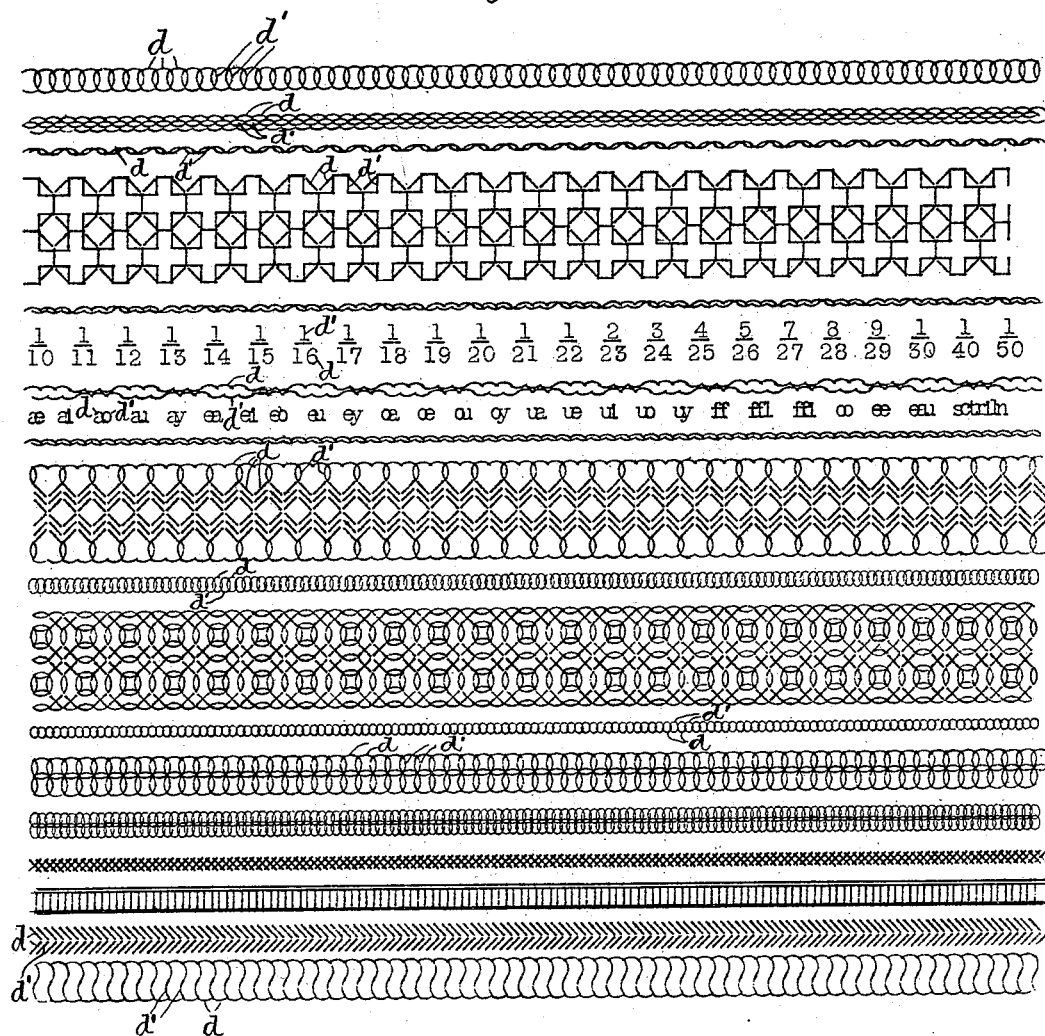
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TYPE WRITING MACHINE.

No. 493,016.

Patented Mar. 7, 1893.

Fig. 14.



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Edward E. Kinsey

Inventor,
Joseph M. Crary, per
Crane & Miller, attys.

UNITED STATES PATENT OFFICE.

JOSEPH M. CRARY, OF JERSEY CITY, NEW JERSEY.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 493,016, dated March 7, 1893.

Application filed August 15, 1892. Serial No. 443,114. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. CRARY, a citizen of the United States, residing at Jersey City, Hudson county, New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, fully described and represented in the followingspecification and the accompanying drawings, forming a part of the same.

10 The object of this invention is to facilitate the printing of characters intermediate to any previous type impression formed by a type-writer, so that a caret-mark may be inserted between letters, letters may be inserted
15 ed over and between other letters in connection with a caret-mark, subscript and superscript letters may be inserted intermediate to the letters upon the line, vulgar fractions may be inserted at interspaces, and various combinations of characters may be produced in
20 ornamentation of typewritten work, as for instance, in borders, and other parts of the written page. These objects are effected by a single adjustment of the paper in relation
25 to the type impressions, which may be effected in some machines by shifting the paper itself a half space in relation to the printing mechanism, and in other machines by shifting
30 the printing mechanism a half space in relation to the paper, which is easily accomplished by shifting through a half space the carriage upon which the type mechanism is fed step by step during the printing of a single line. A machine requiring the first described adjustment is shown in Figures 1 to
35 7 inclusive in the annexed drawings, and a machine requiring the second mode of adjustment is shown in Figs. 8 to 13 inclusive. The first machine is similar to that patented
40 to me June 21, 1892, with No. 477,404, and title "typewriting machine." In this machine the carriage upon which the type mechanism is moved step by step is secured upon a stationary stand, in which a strip platen is
45 provided to sustain the paper under a line of type impressions, and a feed roller is mounted adjacent to the platen to move the paper across the same, for line spacing.

Fig. 1 is a plan of the machine, and Fig. 2
50 a side elevation of the same, with a portion only of the finger keys and type bars illustrated. Fig. 3 is a plan of the stand, Fig. 4

an end view of the same; Fig. 5 a cross section on line *x, x*, in Fig. 3; Fig. 6 a plan of the feed roll and its shifting devices, and Fig. 7 a
55 cross section on line *z, z*, in Fig. 4. Figs. 4 to 7 inclusive are drawn upon twice the scale of Figs. 1, 2 and 3. The machine shown in Figs. 8 to 13 inclusive is like that illustrated in the Patent No. 477,517, issued June 21, 1892, with
60 title "type-writing machines." Fig. 8 shows an elevation of a table with a book thereon, a platen supported over the book by adjustable legs, and the printing mechanism tipped upward upon supports or seats attached to
55 the platen; thus showing the under side of the bed frame, the carriage, and the type mechanism. Fig. 9 is a plan of the platen, with a dotted outline of the bed frame. Fig. 10 is an edge view of the bed frame. Fig. 11 is a
70 diagram showing the side bar of the bed frame and its attachments, taken on line *x, x*, in Fig. 10, with the locking plate moved to the right. Fig. 12 is a similar diagram with the locking plate moved to the left. Fig. 13
75 is a cross section of the platen and the bed frame, taken on line *y, y*, in Figs. 1 and 10; and Fig. 14 exhibits sundry illustrations of type written work effected with the use of my
80 interspacing devices.

The parts shown herein which correspond with those shown in the said patents, Nos. 477,404 and 477,517, are marked with the same reference letters, as are used in the patents.

In Figs. 1 and 2, the carriage E is shown
85 mounted upon a stand A, to which it is rigidly secured by screws *f'* shown in Figs. 1 and 4. The carriage is thus held stationary, and the type carrier frame is represented with two circular plates D, D', joined by posts D², and
90 such mechanism is fed step by step upon the carriage E by suitable pawls attached to a lever *h* and acting upon a feed rack *e* (Fig. 1).

A ribbon *j* is shown carried over a ribbon guide *e'* upon the end of the lever *h*, and the
95 type arms *d* are pivoted upon the plate D and adapted, when actuated by the finger keys *r'*, to strike downward upon the ribbon at the printing point. Such point lies over a strip platen *o* secured upon the stand parallel with
100 the rack *e*, and the paper is held between the ribbon and the platen so that a line of type impressions is made upon the paper, over the center of the platen, as the type mechanism

is moved upon the carriage. When such a line of impressions is printed upon the paper, the paper is moved transversely across the platen, and such line spacing is effected by a roller o' (see Figs. 3 to 6 inclusive) mounted in the stand at the edge of the platen, and the spring rollers o^2 upon its upper side gripping the paper to hold it and propel it across the surface of the platen.

The rack e furnishes the means of letter spacing the type impressions uniformly upon the paper, and to furnish a means of printing impressions between their normal positions, I make the feed roller o' movable longitudinally through a distance equal to one-half of the regular letter spaces. The ends of the feed roller are fitted to journal bearings o^6 in the stand A, and the roll is thus held at the proper level adjacent to the platen.

Outside of the stand one end of the roll spindle is provided with a wheel p to turn the same for line spacing, the latter being regulated by a ratchet wheel y and pawl y' .

The longitudinal movement is effected by means of arms o^4 in the ends of which the roller o' is journaled, the arms being secured rigidly to a shaft p^3 which is fitted movably at its ends (by dovetails o^5) to the top of the stand A, and its longitudinal movement restricted to the desired amount by stops p^6 . The arms o^4 embrace shoulders upon the feed roller, so that when the shaft p^3 is shifted longitudinally the roller is carried therewith, and as the paper is gripped between the spring rolls o^2 and the feed roll o' , the paper is moved therewith, upon the platen, a half a space to the right or the left of its normal position, as may be desired.

The shaft p^3 and arms o^4 constitute a frame which holds the roller longitudinally, and to secure the frame at either end of its stroke, a spring p^7 is affixed to the frame and provided at the end with a wedgeshaped tooth p^8 , which is adapted to engage a similar tooth p^6 fixed upon the stand A, adjacent to one of the arms o^4 . The frame is shown in Fig. 3 pressed toward the upper end of the drawing, with the end of the shaft p^3 in contact with the stop p^6 , and the enlarged section in Fig. 7 shows the arm o^4 in a corresponding position, with the tooth p^8 upon the upper side of the wedge p^6 upon the stand. The movement of the frame toward the opposite end of the stand would spring the tooth p^8 over the point of the wedge p^6 , and lock it elastically upon the opposite side of the same. The frame, when shifting the feed roller longitudinally, may thus be held in its adjusted position without any attention from the operator, while the elasticity of the lock adapts it to be moved in either position without voluntarily disengaging any of the parts. It will readily be seen that when the frame is shifted to either of its extreme positions, and a line of type impressions commenced upon the paper, such impressions will be printed at the normal distances apart, by

means of the ordinary spacing mechanism, consisting in the rack e shown in Fig. 1.

When it is desired to insert a caret mark, or any other character, intermediate to the ordinary type impressions, the frame would be shifted longitudinally until in contact with the opposite stop, and as such movement is (in the construction of the machine) made just one half that of the ordinary letter space, the paper would be shifted correspondingly, and the succeeding type impressions would be made intermediate to those already formed. The spring rolls o^2 are attached to the shaft p^3 by arms p' and thus move with the roller o' , and the arms are extended in the rear of the shaft to form paper guides p^3 which in connection with a table o^3 serve to direct the paper between the rolls o' and o^2 , as indicated by the dotted lines lettered Q in Fig. 5. A shaft p^5 is also affixed to the top of the stand at the opposite side from the shaft p^3 , and paper guides p^4 are projected therefrom close to the edge of the platen, where their ends are slightly upturned to guide the paper downward after it is printed. Such guides add materially to the convenience of the operator in manipulating the paper. Such adjustment is effected by shifting the paper in relation to the type impressions, but with the construction shown in Figs. 8 to 13 inclusive, the adjustment is effected by shifting the type supporting mechanism in relation to the paper.

In Fig. 8 a book P is shown opened and laid upon a table A'. A platen C is shown supported above the table; by links U, forming legs to support the platen adjustably over the surface of the book. When thus adjusted the platen is stationary; as well as the hooks a which are projected from its four corners, as shown in Fig. 9, to guide the bed frame b ; the outline of which is merely indicated in dotted lines in such figure, although it is shown turned upward to expose the under side, in Fig. 1. When in such upturned position a leaf P of the book may be adjusted upon the platen and secured by suitable clamps merely indicated in Figs. 9 and 13; and fully described, with the parts shown in Fig. 1, in my said patent No. 477,517.

The type carriage and the type mechanism in Fig. 8, are of the same construction as the same parts shown in Fig. 1 herein, the type carriage E being adjustable in the bed frame b , for line spacing over the leaf P' held stationary upon the platen C. The rack e shown in Fig. 1, or equivalent means attached to the carriage E, would be used to move the type mechanism space by space upon the carriage E, in printing each line of characters; and to print in spaces intermediate thereto I make the bed frame b movable over the platen, between hooks a' attached to the platen, at a suitable distance apart to allow the required movement of one half a space. Such half space is indicated at a^2 in Figs. 8 and 13, at

the right hand side of the bed frame; the platen being shown the full size in the latter figure, but broken away at the middle for want of room upon the drawings. In this figure, the carriage E is indicated by a dotted line fitted between the side bars of the bed frame and held in place by the plates a^3 and by the racks R, which would be used for line spacing, as set forth in my patent No. 477,517.

The hooks a' are shown (as in Fig. 9) formed upon flat plates a secured to the under side of the platen and projected out a suitable distance from the same, and thin plates a^3 are shown attached to the under side of the bed frame to press upon the edges of the platen and thus clamp the leaf upon either edge of the same. The leaf is indicated by a line P' in Fig. 13, between the edge of the platen and the plate a^3 , with one of the clamps c applied to the leaf near the opposite edge of the platen, as would be required where the leaf extended only part way across the platen. The bed frame and printing mechanism are supported by the contact of the plates a^3 with the platen.

With the bed frame turned down and held in place by the hooks a' , as indicated by the dotted lines b in Fig. 9, the type mechanism would be movable transversely and longitudinally across the platen, and the shifting of the bed frame, one half a space to the right or left over the platen, would produce the type impressions intermediate to their normal positions upon the paper. The construction of the hooks a' permits of such shifting, and the locking device to retain the bed frame in its adjusted position, is shown in Figs. 10 to 13, and consists in a slide b^2 fitted to one edge of the bed frame by screws w inserted through slots w' in the slide. The slide is provided at one edge with notches b^3 adapted to admit the hooks a' , and a lug w^2 is bent upon the under edge of the slide adjacent to the notch to admit the hook a' between the same and the bed frame. When the slide is shifted in one direction, as shown in Fig. 11, the lugs embrace the outer sides of the hooks and hold the bed frame rigidly to such hooks, and the printing impressions may then be made in their normal positions upon the platen.

When it is desired to print the impressions intermediate to their normal positions, the slide is moved toward the hook (as indicated by the arrow a^4 in Fig. 11), and the bed frame may then be pushed to one side, clearing the hook from the bed frame a half a space, as indicated in Figs. 12 and 13. A further movement of the slide in the direction of the arrow a^4 serves to enter a portion of the slide between the bed frame and the hook, as shown in Fig. 12, and thus locks the bed frame in its new position.

It is obvious that the printing may be commenced with the bed frame secured against the hooks a' at either the right or left hand edge of the platen, and that the type impressions when commenced will be spaced nor-

mally; while the shifting of the bed frame upon the platen, into contact with the opposite hook, will permit the printing of the type impressions intermediate to their normal positions. With this construction, the type mechanism is shifted, a half-space, in relation to the paper fixed upon the platen C; and when thus shifted all the type impressions would lie intermediate to the normal positions previously determined.

With the construction shown in Fig. 1, as well as in Fig. 8, the feed rack, or its equivalent which is used to space the type impressions normally, is shifted in relation to the paper; in the one case (as in Fig. 1) by moving the paper a half-space in relation to the carriage which bears the feed rack, and in the other case (as in Fig. 8) by moving the carriage which bears the feed rack a half-space in relation to the paper. In either case it is desirable to lock the carriage and its letter-spacing device in its new relation to the paper; which is effected in Fig. 1 by the spring wedge shown in Fig. 7, and in Fig. 8 is effected by the slide b^3 engaging with the hook or hooks a' attached to the platen.

From the above description it will be seen that my invention involves an addition, to the mechanism normally used for spacing the type impressions uniformly, of means for printing the type impressions intermediate to their normal positions upon the paper, and such additional means are shown herein operated to alter the relation of two elements, namely, the paper, and the carriage upon which the type mechanism is shifted step by step for letter spacing.

Having shown the application of my invention to two type-writing machines of very dissimilar character, anyone skilled in the art can readily adapt the invention to machines of other construction, as it is immaterial what means be employed to shift the paper and the printing mechanism in relation to one another.

The carriage upon which the type mechanism is moved step by step is shown herein of flat rectangular form; but such form is wholly immaterial, as the carriage and the paper can be shifted a half space in relation to one another, whatever the shape or construction of the carriage may be.

Fig. 14 presents illustrations of work actually done upon a typewriter of the class shown in Fig. 1, with the aid of the interspacing mechanism described, the characters d having been formed with the paper in its normal position, and the characters d' having been formed after the interspacing device had been operated thus impressing the characters d' intermediate to the characters d . The characters d and d' are all spaced the same distance apart in the line, and either set of characters may be regarded as intermediate to the other, by the peculiar arrangement of such characters, effected through the agency of the interspacing mechanism. The first

three lines show combinations of the ordinary "parenthesis" characters, with two additional characters in the first line, which are shaped like the "parenthesis" but arranged at right angles thereto. One line shows vulgar fractions, one line shows various diphthongs formed by writing one letter in the half space adjacent to another letter; and the remaining lines show ornamental combinations formed by printing inclined, horizontal, and vertical lines; and the letter o, both small and capital, upon the regular spaces and also upon the spaces intermediate to the same. The last line is formed of the same characters as the first line.

In printing fractions the denominator is first printed and the line space then given to the paper and the numerator subsequently printed, or the reverse proceeding is observed. In printing a design such as is shown at the top of Fig. 14, the normal impressions are first made for the full part of the line, the printing mechanism and paper carriage are then longitudinally adjusted with relation to each other and the second or intermediate impressions are then made.

Having thus set forth the nature of my invention, what I claim herein is—

1. In a typewriter, the combination, with a platen for supporting the paper, of a carriage supporting the type mechanism movably, feed mechanism for shifting the type mechanism step by step upon the carriage, and means for shifting the paper and carriage a half step or space in relation to one another, as set forth.

2. In a typewriter, the combination, with a stand carrying a strip platen and a paper feeding roller, of type mechanism movable longitudinally step by step over the platen, means for moving the feed roller one half a space longitudinally with the paper, and a stop for determining such movement, substantially as herein set forth.

3. In a typewriter, the combination, with a

platen for supporting the paper, of a carriage supporting the type mechanism movably, feed mechanism for shifting the type mechanism step by step upon the carriage, means for shifting the paper and the carriage a half step or space in relation to one another, and means for locking the carriage in its adjusted position, as set forth.

4. In a typewriter, the combination, with a stand carrying a strip platen and a paper feeding roller, of type mechanism movable longitudinally step by step over the platen, a frame movable longitudinally with the feed roller, stops to limit the movement of the frame, the wedge p^6 fixed upon the stand, and the spring wedge p^8 fixed to the movable frame, the whole arranged and operated substantially as set forth.

5. In a typewriter, the combination, with a stand carrying a strip platen and a paper feeding roller, of type mechanism movable longitudinally step by step over the platen, the guide bar p^2 movable longitudinally upon the stand, the arms o^4 secured thereto and embracing shoulders upon the feed roller, the wedge p^6 upon the stand, the spring wedge p^8 upon the frame, and the knob p adapted to rotate the feed roller and to shift it longitudinally, substantially as set forth.

6. In a typewriter, the combination, of the stand A, with the strip platen o , the feed roller o' the bar p^2 carrying the spring rollers o^2 , the paper guides p^3 projected from such bar, and the bar p^5 secured at the opposite side of the platen and provided with the paper guides p^4 , the whole arranged and operated substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOSEPH M. CRARY.

Witnesses:

THOMAS S. CRANE,
K. WEBSTER.