

(No Model.)

4 Sheets—Sheet 1.

T. OLIVER.  
TYPE WRITING MACHINE.

No. 450,107.

Patented Apr. 7, 1891.

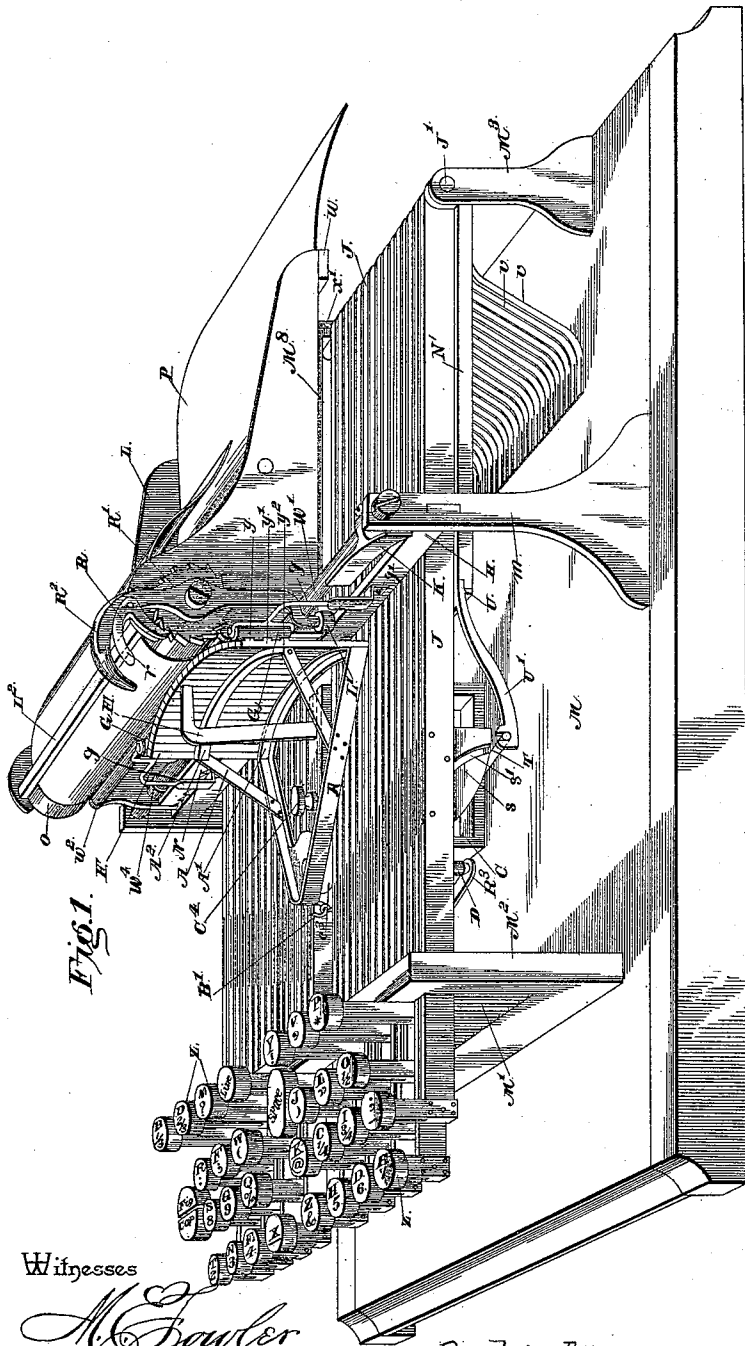


Fig. 1.

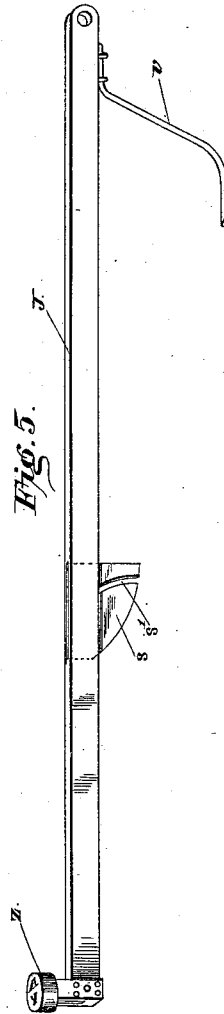


Fig. 5.

Witnesses

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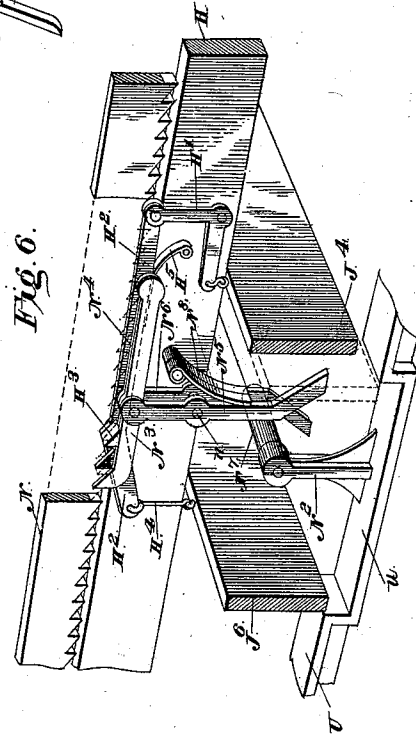
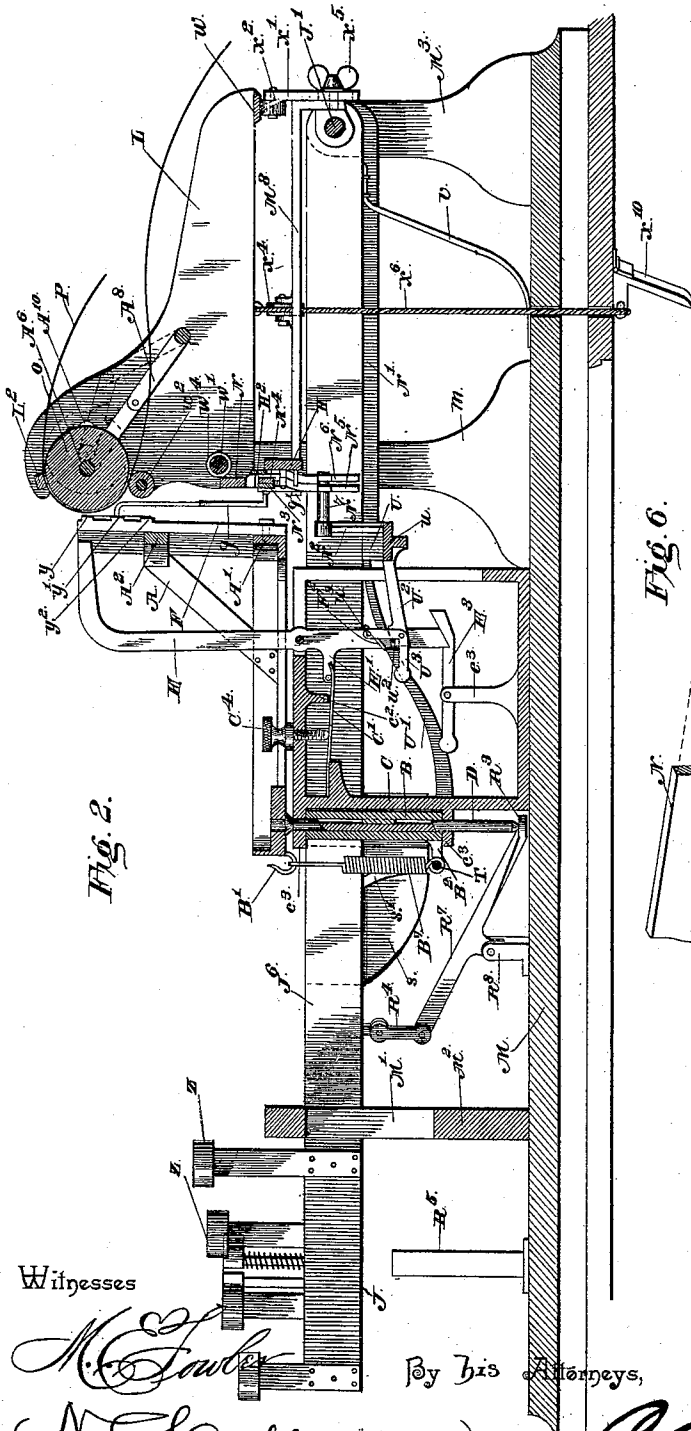
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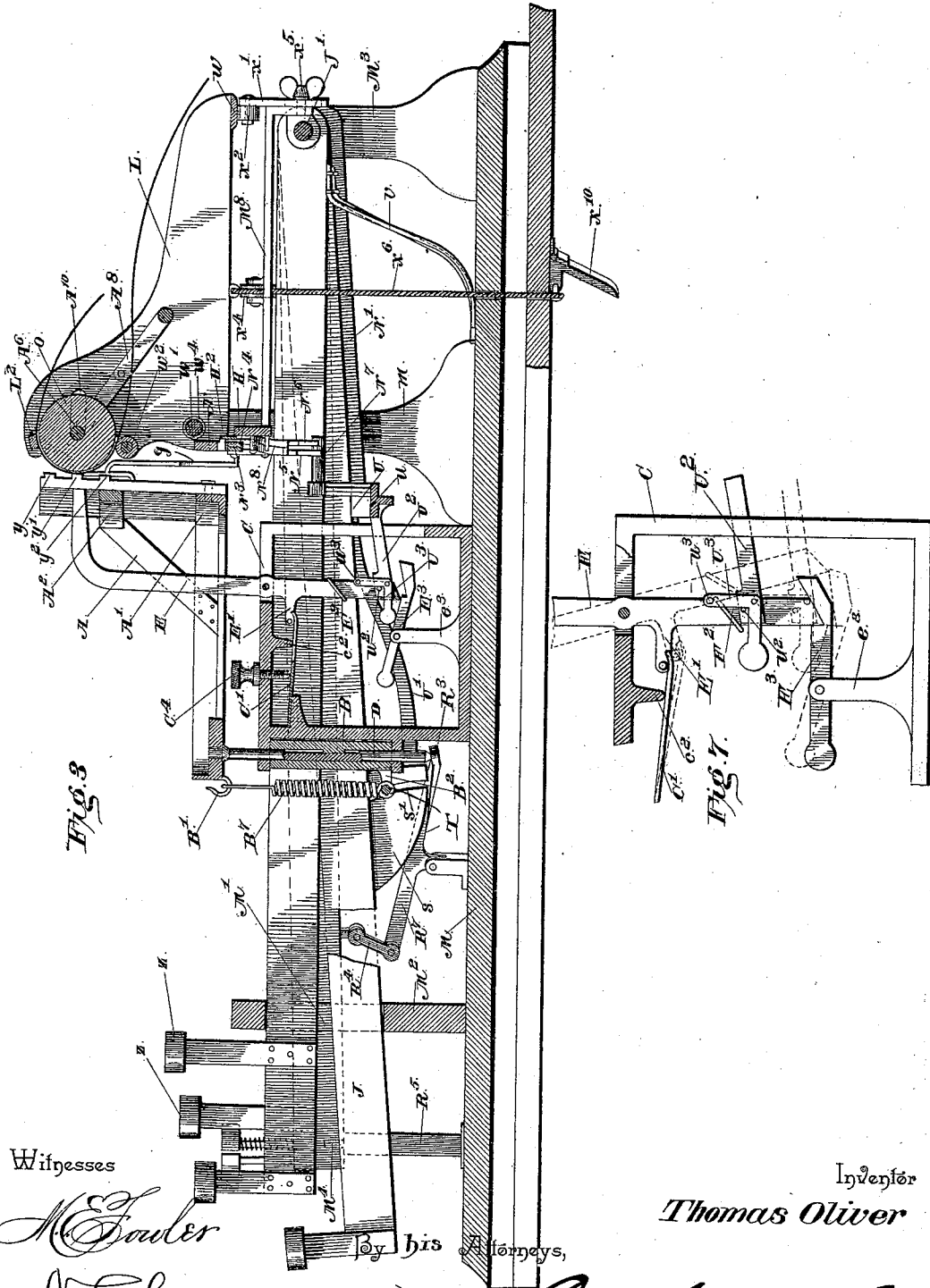
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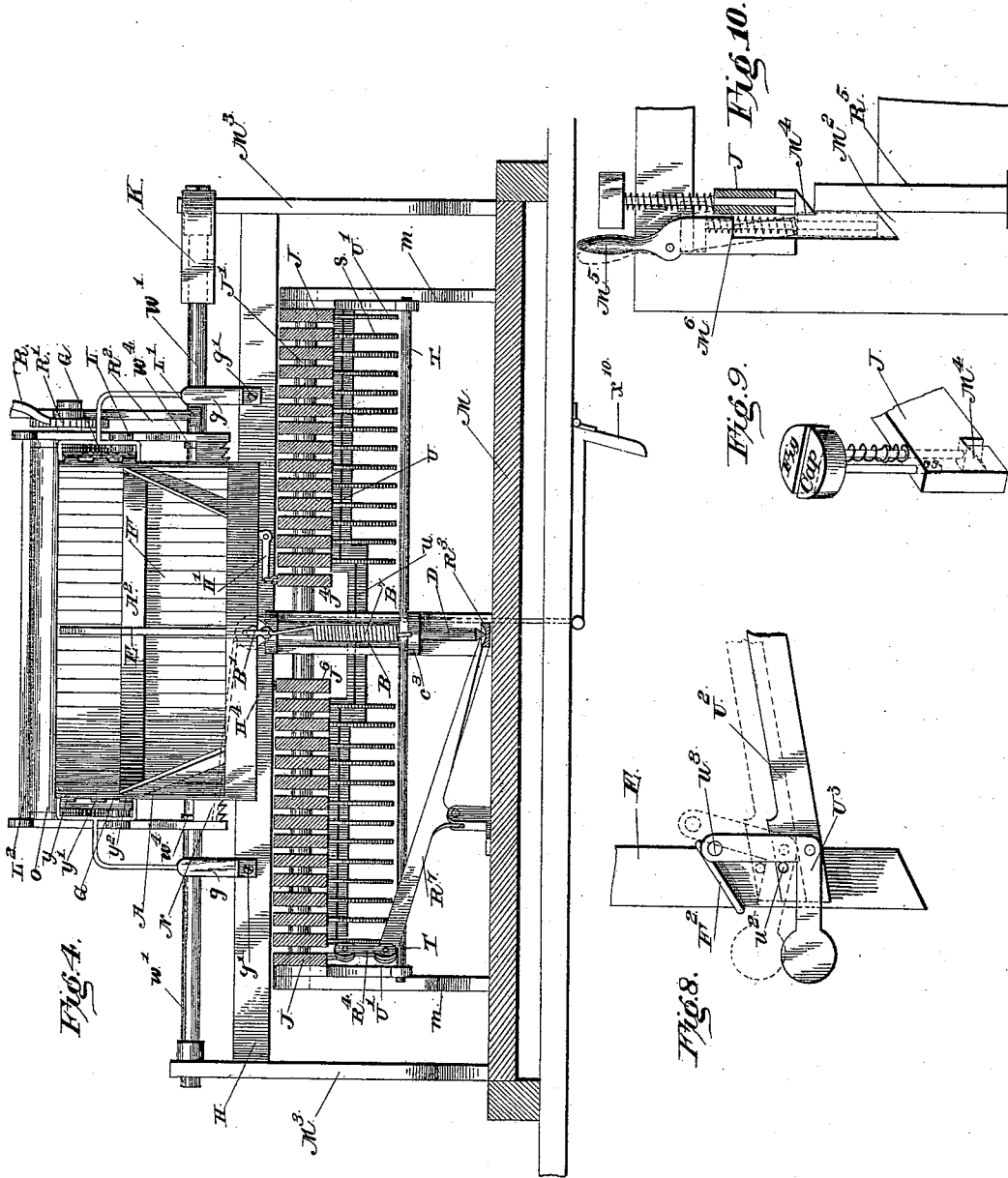
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4 Sheets—Sheet 4.

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# UNITED STATES PATENT OFFICE.

THOMAS OLIVER, OF MONTICELLO, ASSIGNOR OF ONE-THIRD TO CHARLES J. PETERSON, OF DUBUQUE, IOWA.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 450,107, dated April 7, 1891.

Application filed August 26, 1890. Serial No. 363,106. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS OLIVER, a citizen of the United States, residing at Monticello, in the county of Jones and State of Iowa, have invented a new and useful Type-Writer, of which the following is a specification.

This invention relates to printing-machines, and more especially to that class thereof known as "type-writers;" and the object of the same is to provide a type-writer having type-bars mounted on a pivoted arc, which is turned by means of differently-shaped cams carried by the key-levers and engaging a rod connected to the axis of said arc, and which type-bars are struck by a hammer that is tripped at the proper moment during the descent of the key-lever.

A further object of the invention is to provide improved means for raising and lowering the arc to present different type-faces to the printing-surface, as well as to provide means for moving the platen-roller away from the type, as when manifolding or when writing upon thick paper.

These objects I accomplish by the construction hereinafter more fully described, and illustrated in the accompanying drawings, in which—

Figure 1 is a general perspective view of this machine complete. Fig. 2 is a central vertical longitudinal section showing the parts at rest. Fig. 3 is a similar section showing the arc raised so as to strike a capital letter and one key depressed and the hammer as tripped. Fig. 4 is a transverse section showing the arc with its raising mechanism, the key-levers in section, and the cams carried thereby. Fig. 5 is an enlarged perspective detail of one key-lever. Fig. 6 is a similar detail of the carriage-operating mechanism. Fig. 7 is an enlarged side elevation of the type-hammer, showing the manner in which the same is tripped. Fig. 8 is a similar elevation showing the tripping mechanism in a different position. Fig. 9 is a perspective detail showing the shifting-key and locking attachment, and Fig. 10 is a front elevation of the same.

Referring to the said drawings, the letter M designates a suitable base, from which at the rear rises a pair of standards M<sup>2</sup>, between

whose upper ends is mounted a shaft J'. Pivoted at their rear ends on this shaft are the key-levers J, whose bodies pass between guides M' in a frame-work M<sup>2</sup>, mounted upon the base near the front end, and whose forward ends are provided with the keys Z, these levers being held in normally raised position by springs *v* of the construction shown or of any equivalent construction which will answer the purpose. Depending from each key-lever J is a plate *s*, having a cam-shaped slot *s'*, for a purpose to appear hereinafter.

Mounted upon the base M is a rectangular frame-work C, having ears *c*<sup>2</sup> in its front side at its center, and loosely mounted through these ears is a vertical shaft D, whose lower end is seated in the step R<sup>3</sup> at the rear end of a lever R<sup>7</sup>, centrally pivoted in a bracket R<sup>8</sup>, rising from the base, which lever is turned upon its pivot to raise and lower the shaft D by the shifting-key, to be described hereinafter. Mounted loosely on the shaft D, between the ears *c*<sup>2</sup>, is a tube B, and from the lower end of this tube projects an arm B<sup>2</sup>, which carries diverging rods T, as best seen in Fig. 4, which rods are engaged by the cam-shaped slots *s'* of the plates *s* on the key-levers. By this means as each key-lever is depressed its cam moves one of the rods T and turns the tube B a greater or less extent upon the vertical shaft D, according to the shape of slot *s'*. Rigidly mounted upon the upper end of the shaft D is a pair of arms extending to the rear and slightly diverging, and there connected by a segmental frame, the whole forming what I shall call the "arc" A. The front corner of this arc carries a depending hook B', and between this hook and the arm B<sup>2</sup> is a spring B<sup>7</sup>, whereby the arc is held normally in the position shown in Fig. 2, but may be raised through the tube B, as shown in Fig. 3, the arc turning with the tube by reason of the fact that the interior of the latter is squared so as to fit upon the shaft D, or these two parts may be connected by a spline and groove, as shown. The segment A' of the arc is of resilient metal, and connected rigidly thereto at their lower ends are a number of type-levers F, having lower-case letters *y* at their upper ends, capital letters *y'* just below said lower-case letters, and

punctuation-marks, figures, fractions, and miscellaneous characters  $y^2$  below said capitals. These type-levers  $F$  stand normally against the brace  $A^2$  of the arc, as seen in Figs. 2 and 3, whether the arc be raised or lowered, the spring-segment retaining them in this position, and it will be understood that when the arc is raised either the capitals or the miscellaneous characters are brought opposite the paper-carriage, as seen in Fig. 3.

One of the end key-levers  $J$  is connected by a rod  $R^4$  with the lever  $R^7$ , and the key for this lever is of the shape best shown in Fig. 9. When the half marked "Cap." is struck, the key-lever  $J$  is depressed and strikes the upper end of the stop  $R^5$ ; but when the half-marked "Fig." is struck its shank slides through the lever  $J$  and projects a small wedge  $M^4$ , which strikes and slips off the stop  $R^5$ , thereby allowing the lever  $J$  to descend to the base of the frame-work  $M$ .  $M^3$  is a catch pivoted to the frame-work  $M^2$  and having a shoulder  $M^6$  at a proper point to hold the lever  $J$  depressed against the top of the stop  $R^5$ , and the lower end of this catch will hold the lever depressed against the base  $M$ . It will be understood that the depression of this lever by one of the halves of the shifting-key raises the arc  $A$  so that either the capitals  $y'$  or the miscellaneous characters  $y^2$  will be printed when one of the keys is struck.

Rising from each side of the base  $M$  is a standard  $m$ , which standards are connected by a cross-bar  $H$  and also by a cylindrical rod  $w'$  at their upper ends.

$L$  is the paper-carriage, having Babbitt-metal bushing  $w^4$  sliding upon the rod  $w'$ , and also having a strip  $w$  at its rear end, which rests upon a roller  $x^3$ , carried in a bracket  $x'$ , which is adjustable vertically by a set-screw  $x^5$  in the depending portion of a longitudinal bar  $M^8$ , as seen in Fig. 2. The journals  $A^6$  of the paper-roller  $O$  pass through slots  $A^{10}$  in the ends of the carriage  $L$ , and a toggle-lever  $A^8$  is provided just inside each end piece of the carriage to hold the roller  $O$  normally forward, as shown in Fig. 2, or to permit it to be drawn to the rear, as seen in dotted lines in Fig. 2.

$w^2$  is a small rubber-coated roller just below the main roller  $O$ , and  $L^2$  is the bar which connects the upper corners of the end pieces of the carriage. Upon the end of the roller  $O$  outside the carriage end piece is secured a ratchet-wheel  $R'$ , and outside this wheel upon the shaft of the roller is mounted a lever  $R^2$ , having a pawl  $R$  engaging the teeth of the ratchet-wheel, said pawl being of  $L$  shape, pivoted at its bend to the lever  $R^2$  with its outer arm  $r$  extending forwardly, so as to be operated by the type-writer operator. The lower end of the lever  $R^2$  carries a roller  $L'$ , which, when the carriage is moved to the right, rides upon a forwardly-curved cam  $K$  and causes the ratchet-wheel  $R'$  and with it the roller  $O$  to be turned the distance of one line.

$x^4$  is a pulley journaled in the bar  $M^8$  above the center of the bank of key-levers, and over this pulley passes a cord  $x^6$ , connected at one end with the left end of the carriage  $L$  and passing through a hole in the base  $M$  and in the table beneath it, and its other end is connected to an ordinary knee-shift  $x^{10}$ . The carriage is retracted by this knee-shift in a well-known manner. In the front side of the carriage nearly above the cross-bar  $H$  is the feed-rack  $N$ , whose teeth face toward the right, as seen in Fig. 6. Mounted on a pivot  $n$  at about the center of the cross-bar  $H$  are two levers  $N^5$  and  $N^6$ , having oppositely-bent lower ends, and to the upper ends of these levers are respectively pivoted the weighted pawls  $N^3$  and  $N^4$ , which engage said feed-rack.

$N^7$  is a roller in the upper end of an arm  $N^2$ , the latter moving vertically at each stroke of a key-lever  $J$  in a manner which will be hereinafter explained, and  $N^8$  are springs secured to the cross-bar  $H$  and pressing said levers against the roller. It will be obvious that as the roller descends the pawl  $N^4$  will be moved forward and the pawl  $N^3$  backward, and as the roller ascends the pawls will move in the opposite directions. By this means the feed-rack is passed over the pawls, carrying the carriage with it to the left.

$H^2$  is a third pawl, whose operating-face  $H^3$  stands over the light ends of the pawls  $N^3$  and  $N^4$ , and one end of this pawl is connected by a bell-crank lever  $H'$  with one of the key-levers  $J^4$ , which carries the space-key. When this space-key is depressed, the face  $H^3$  will be moved forward and the feed-rack will be moved thereby. When the end of the line has been reached, the face  $H^3$  can be depressed through the instrumentality of another key for that purpose, which is mounted on another key-lever  $J^6$ , and which is connected by a link  $H^4$  with the free end of the pawl  $H^2$ , as shown, the depression of this end of the pawl and of the face  $H^3$  against the tension of the supporting-spring  $H^5$  disengaging all the pawls from the rack  $N$ .

Pivoted within the frame-work  $C$  is a hammer  $E$ , whose upper end is curved rearwardly and stands in rear of the upper end of the type-levers, and  $C'$  is a spring carried by said frame-work and whose range of movement is adjustable by the set-screw  $C^4$ . This spring bears upwardly against the arm  $E'$  of said hammer and throws the operative end of this hammer normally rearward until the spring strikes a projection  $c^2$  within the frame-work or the tip of the set-screw  $C^4$ , as shown in Fig. 7.

$N'$  are arms pivoted at their rear ends upon the shaft  $J'$  and connected at their front ends by a cross-bar  $U$ , which extends below all of the key-levers  $J$ , but is depressed at its center, as shown at  $u$  in Fig. 6, in order that the key-levers  $J^4$  and  $J^6$ , which carry the space-key and the line-key, may be depressed without affecting this cross-bar, and the shifting key-lever also passes by the left-hand end of this

cross-bar and does not affect it when it is depressed. From this cross-bar rises the arm  $N^2$ , mentioned above as carrying the roller  $N^7$ , which operates the pawls that feed the carriage. Projecting forwardly from about the center of the cross-bar  $U$  is an extension  $U^2$ , to the forward end of which is pivoted the elbow of an L-shaped dog  $U^3$ , one arm of which is weighted, whereby the other arm is held normally upright and against a stop-pin  $w^2$  in said extension.

The hammer  $E$  is provided near its lower end with a lateral inclined projection  $F^2$ , which engages a pin  $w^3$ , projecting laterally from the upright arm of the dog, and mounted in a bracket  $e^3$  upon the base  $M$  is a weighted detent  $E^3$  of approximately the shape shown in Fig. 7, which detent engages the lower end of the hammer.

With a machine of the above construction the toggle-lever  $A^8$  is raised by the finger of the operator, the roller  $O$  moved to the rear, and the paper  $P$  applied thereto in a manner best seen in Fig. 2, after which the toggle-lever  $A^8$  is straightened and the paper is grasped between the rollers  $O$  and  $w^2$ . The writing is then done by striking the keys in the usual manner, and each time a key-lever is depressed the cam-slot  $s'$  engages the rod  $T$  and turns the arc so as to bring the proper type-lever into position. The first portion of the descent of the key-lever  $J$  depresses the cross-bar  $U$  sufficiently to disengage from said rod  $T$  catches  $U'$ , carried by said cross-bar, as seen in Fig. 1, whereby the complete movement of the rod  $T$  and an oscillation of the arc are permitted. Upon the raising of the key-lever  $J$  by the spring  $v$  the cam  $s'$  returns the arc to its normal position and the catches  $U'$  re-engage the rod  $T$  to hold the arc in place. As the cross-bar  $U$  descended when the key was depressed, its extension  $U^2$  also moved downwardly, as will be understood. The pin  $w^3$  of the dog  $U^3$  moved across the inclined projection  $F^2$  of the hammer  $E$ , and the latter was turned to the position shown in dotted lines in Fig. 7. The key having been released from this position by the pin  $w^3$  sliding off the lower end of the inclined projection  $F^2$ , the spring  $C'$  threw the face of the hammer forcibly against the type-lever and a character was printed upon the paper. The lower end of the type-lever being rigidly connected to the spring-segment  $A'$  when its upper end was driven forward by the hammer, the segment was bent at the point of connection, and the torsional power of said segment causes the return of the lever to its proper and normal position. The first movement of the hammer depressed the detent  $E^3$  to the position in dotted lines in Fig. 7; but upon the release of the hammer the latter was thrown forward so quickly that the lower end of the hammer passed over the notch in said detent, but beyond its normal position, and only re-engaged said notch upon a rebound movement, whereby the face of the

hammer is normally held out of contact with the type-levers. The descent of the cross-bar  $U$  also carried downward the roller  $N^7$ , and this movement pressed the pawl  $N^3$  and rack  $N$  forward half a space and drew the pawl  $N^4$  rearward half a space, whereby it engaged the next tooth. All this has occurred from the simple depression of the key. Upon the release of the key and the rise of the key-lever the arc was returned to its normal position in the manner above described. The extension  $U^2$  rises and the dog  $U^3$  moves around the projection  $F^2$ , as shown in dotted lines in Fig. 8. The rack  $N$  moves the distance of the other half-notch, and the type-faces are inked by an ink-roller  $G$ , supported from the bar  $H$ , as seen in Fig. 1, although any other inking device which is capable of use on this machine will answer equally well.

When it is desired to strike a capital or a miscellaneous character, the arc is raised by the shift-key with the operator's left hand before the key is struck and the character printed in a manner which is common in the Remington machine. When it is desired to make a space, as between two words, the space-key is depressed, whereby the pawl-face  $H^3$  is moved the distance of one notch through the mechanism above described, the two pawls  $N^3$  and  $N^4$  slipping over the teeth of the rack  $N$  and acting as detents in this case. When the end of the line has been reached, the "line-key" is depressed, whereby the pawl  $H^2$  is moved downward and its face  $H^3$ , together with the pawls  $N^3$  and  $N^4$ , disengage from the rack  $N$ . Pressure of the knee against the knee-shaft  $x^{10}$  draws upon the cord  $x^6$  and returns the carriage  $L$  to the beginning of the lines. Upon such return the roller  $L'$  on the lower end of the arm  $R^2$  rides upon the forwardly-curved face  $K$  and the pawl  $R$  engages the ratchet  $R'$  and turns the roller to the rear, whereby the paper is elevated, so that the next line thereon is brought into position to be printed.

To change the color or character of the ink, the screws  $g'$  are withdrawn, and the brackets  $g$ , carrying the inking-rollers  $G$ , removed and others substituted therefor. To change the size or style of type, the spring  $B^7$  is disengaged from the hook  $B'$  and the arc  $A$  and its supporting-shaft  $D$  bodily removed from the machine, another arc and shaft being substituted therefor having type-faces such as are desired. To manifold or to write on extra thick paper, the set-screw  $x^5$  is loosened and the roller  $x^2$  is lowered, whereby the rear end of the carriage  $L$  is permitted to drop, turning around the rod  $w'$  as a pivot, and the roller  $O$  is thereby drawn a little to the rear, so as to permit the insertion of more material between it and the faces of the type in their normal position. To write in capitals only, the shift-key is depressed and held depressed by the catch  $M^5$ .

Various changes in the details of construction and in the arrangement of the several

parts will suggest themselves to a mechanic skilled in this art, and may be made without departing from the spirit of my invention.

What is claimed as new is—

5 1. In a type-writer, the combination, with the key-lever J and the plate s, secured thereto and having the cam-slots s', of the arc A, carrying the type-levers F, a hammer E, a spring pressing it normally toward the type-  
10 levers, a catch retaining it out of contact therewith, said catch being tripped by the descent of the key-lever, and a rod T, connected to said arc and standing normally below the mouth of said cam-slot, as set forth.

15 2. In a type-writer, the combination, with the key-lever J and the plate s, secured thereto and having the cam-slot s', of the arc A, carrying the type F, a spring-actuated hammer E, a tripping device for said hammer operated by the descent of the key-lever, catches U', carried by said tripping device and having upwardly-opening mouths, and a rod T, connected to said arc and standing normally below the mouth of said cam-slot and within the mouths of said catches, as set forth.

3. In a type-writer, the combination, with the key-lever J and the plate s, secured thereto and having a cam-slot s', of the arc  
30 A, carrying the type-levers F, each provided with a number of type, the vertical shaft D, connected to the center of said arc, a spring-actuated hammer E, tripped by the descent of the key-lever, a tube B, connected by spline and groove with said vertical shaft, a  
35 rod T, connected to said tube and standing normally below the mouth of said slot, and means, substantially as described, for vertically adjusting said shaft, as and for the purpose set forth.

4. In a type-writer, the combination, with the key-levers J and the spring-actuated hammer E, tripped by the descent of one of said levers, of the centrally-pivoted arc A, connections between said levers and arc for turning the latter by the descent of a lever, a spring-segment A' in said arc, a brace A<sup>2</sup> above the same, and type-levers F, rigidly connected to said segment and borne thereby  
50 normally against said brace, as set forth.

5. In a type-writer, the combination, with the arc A, carrying the type-levers F, the vertical shaft D at the center of said arc, the step R<sup>3</sup>, in which the lower end of said shaft is seated, the tube B, connected by spline and groove with said shaft, and the key-levers J, adapted when depressed to turn said tube in a manner set forth, of the frame-work C, having the perforated ears c<sup>3</sup>, in which said shaft is journaled, and from which it is vertically removable, and the spring-actuated hammer E, mounted in said frame-work and tripped by the descent of the key-levers, substantially as described.

65 6. In a type-writer, the combination, with the arc A, the type-levers F, carried thereby, each provided with a number of type-faces

arranged one above the other, the vertical shaft D at the center of said arc, and the key-levers J, adapted when depressed to turn said shaft in a manner set forth, of the frame-work C, having the perforated ears c<sup>3</sup>, in which said shaft is journaled, the spring-actuated hammer E, tripped by the descent of said key-levers, the step R<sup>3</sup>, in which the lower end of said shaft is seated, and a shift-key for raising and lowering said shaft, as and for the purpose described.

7. In a type-writer, the combination, with the arc A, the type-levers F, carried thereby, each provided with a number of faces arranged one above the other, the vertical shaft D at the center of said arc, the upwardly-opening hook B' at the upper end of said shaft, the tube B, connected by spline and groove with said shaft and having an arm B<sup>2</sup>, a spring B<sup>1</sup>, connected to said arm and detachably engaging said hook, and the key-levers J, adapted when depressed to turn said shaft in the manner described, of stationary journals c<sup>3</sup> for said shaft above and below said tube, a step R<sup>3</sup>, in which the lower end of said shaft is seated, a shift-key for raising and lowering said step, and a spring-actuated hammer E, tripped by the descent of the key-levers, all as and for the purpose set forth.

8. In a type-writer, the combination, with the vertically-movable arc A, carrying the type-levers F, the spring-actuated hammer E, and the key-levers J, of the step R<sup>3</sup>, the lever R<sup>7</sup>, pivoted in a bracket R<sup>8</sup> and connected at one end to said step, the rod R<sup>4</sup>, connecting the upper end of said lever with a shift-key lever J, the stop R<sup>5</sup> below said key-lever, and the catch M<sup>3</sup>, having a shoulder M<sup>6</sup> of the same depth as the height of said stop, as and for the purpose set forth.

9. In a type-writer, the combination, with the vertically-movable arc A, carrying the type-levers F, the spring-actuated hammer E, and the key-levers J, of the step R<sup>3</sup>, the lever R<sup>7</sup>, pivoted in a bracket R<sup>8</sup> and connected at one end to said step, the shift-key lever J, connected to the other end of said lever, the wedge M<sup>4</sup> within said shift-key lever, a double key, one-half of which is connected to the shift-key lever and the other half of which slides through the same and is connected to the wedge, the stop R<sup>5</sup> below said key-lever and in the path of the beveled face of said wedge, and the catch M<sup>3</sup>, all as and for the purpose set forth.

10. In a type-writer, the combination, with the arc A, carrying the type-levers F, the key-levers J, and means for turning said arc by the depression of a key-lever, of the frame-work C, having the projection c<sup>2</sup>, the hammer E, pivoted in said frame-work and having a forwardly-projecting arm E', the spring C', connected to said frame-work with its free end pressing upwardly against said arm in rear of said projection, the set-screw C<sup>4</sup> for adjusting the tension of said spring, and trip-



ping mechanism, substantially as described, for setting and releasing said hammer, as set forth.

11. In a type-writer, the combination, with the arc A, carrying the type-levers F, the key-levers J, and means for turning said arc by the depression of a key-lever, of the spring-actuated hammer E, having the inclined lateral projection F<sup>2</sup>, the cross-bar U, standing below said key-levers, the extension U<sup>2</sup>, connected to said cross-bar, and the weighted dog U<sup>3</sup>, pivoted to said extension and having a lateral pin *w*<sup>3</sup> engaging said lateral projection and retracting the hammer upon the depression of a key, in the manner set forth.

12. In a type-writer, the combination, with the arc A, carrying the type-levers F, the key-levers J, and means for turning said arc by the depression of a key-lever, of the spring-actuated hammer E, having the inclined lateral projection F<sup>2</sup>, the cross-bar U, standing below said key-levers, the extension U<sup>2</sup>, connected to said cross-bar and having a stop-pin *w*<sup>2</sup>, the weighted dog U<sup>3</sup>, of L shape, pivoted at its angle to said extension and its lighter arm standing normally against said stop-pin, a lateral pin *w*<sup>3</sup> in the free end of said lighter arm normally engaging said lateral projection F<sup>2</sup>, and a weighted detent engaging the lower end of said hammer, the whole operating as set forth.

13. In a type-writer, the combination, with the arc A, carrying the type-levers F, the key-levers J, and means for turning said arc by the depression of a key-lever, of the frame-work C, having the projection *c*<sup>2</sup>, the hammer E, pivoted in said frame-work and having a forwardly-projecting arm E', the spring C', connected to said frame-work, standing normally against said projection, and its free end pressing upwardly against said arm, the cross-bar U, standing below said key-levers, the extension U<sup>2</sup>, connected to said cross-bar, a weighted dog U<sup>3</sup>, pivoted to said extension and adapted to trip said hammer, and a weighted detent E<sup>3</sup>, centrally pivoted in a bracket *c*<sup>3</sup> and having a notched lighter end engaging the lower end of the hammer, as and for the purpose set forth.

14. In a type-writer, the combination, with the carriage L, having the rack-bar N, means for drawing said carriage opposite the direction in which writing is done, the key-levers

J, and the space-key lever J<sup>4</sup>, the cross-bar U, standing below said key-levers and having a depression *u* below said space-key lever, and automatic spacing mechanism connected with said cross-bar, of the bell-crank lever H', mounted at its angle on a stationary pivot, one arm thereof being connected to said space-key lever, a pawl H<sup>2</sup>, pivotally connected to the other arm of said lever, and having a face H<sup>3</sup> engaging said rack-bar, a spring H<sup>5</sup>, holding said face normally in operative position, and a line-space lever J<sup>6</sup>, connected to the free end of said pawl, the whole adapted to operate substantially as described.

15. In a type-writer, the combination, with the carriage L, having the rack-bar N, means for drawing said carriage opposite the direction in which writing is done, the key-levers J, the space-key lever J<sup>4</sup>, and the line-space lever J<sup>6</sup>, the cross-bar U, standing below said key-levers and having a depression *u* below said space and line-space levers, the centrally-pivoted levers N<sup>5</sup> and N<sup>6</sup>, oppositely moved by the movement of said cross-bar, and the weighted pawls N<sup>3</sup> and N<sup>4</sup>, carried by said levers with their lighter ends bent upwardly and engaging said rack-bar, of the bell-crank lever H', mounted at its angle on a stationary pivot, one arm thereof being connected to said space-key lever, a spring-actuated pawl H<sup>2</sup>, pivotally connected to the other arm at one end, and having a face H<sup>3</sup> between its ends standing over the light ends of said weighted pawls and also engaging said rack-bar, and a link H<sup>4</sup>, connecting the other end of said pawl with said line-space lever, as and for the purpose set forth.

16. In a type-writer, the combination, with the carriage L, having the slots A<sup>10</sup> in its ends, of the roller O, whose journals A<sup>9</sup> are seated in said slots, and the toggle-levers A<sup>8</sup>, their ends connecting said journals with the carriage and holding the roller at one extremity of the slots when their members align, as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

THOMAS OLIVER.

Witnesses:

J. W. DOXSEE,  
A. K. HERBERT.