

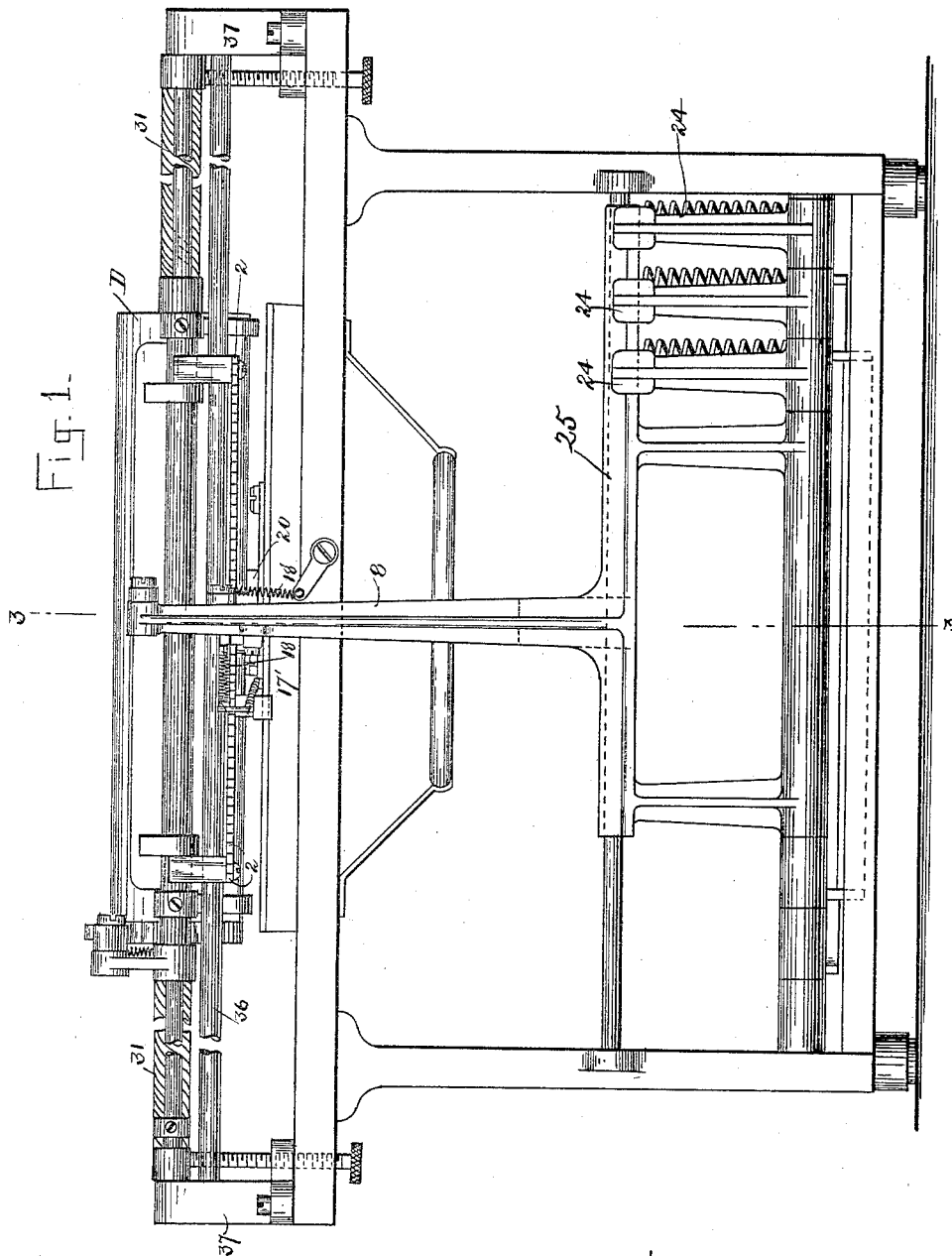
(No Model.)

5 Sheets—Sheet 1.

P. MESICK & A. E. AYER.
TYPE WRITING MACHINE.

No. 442,323.

Patented Dec. 9, 1890.



WITNESSES:

George W. Hawley
W. B. Ramsay

INVENTOR:

Peter Mesick and
Albert E. Ayer.

Night & Brown
Attorneys.

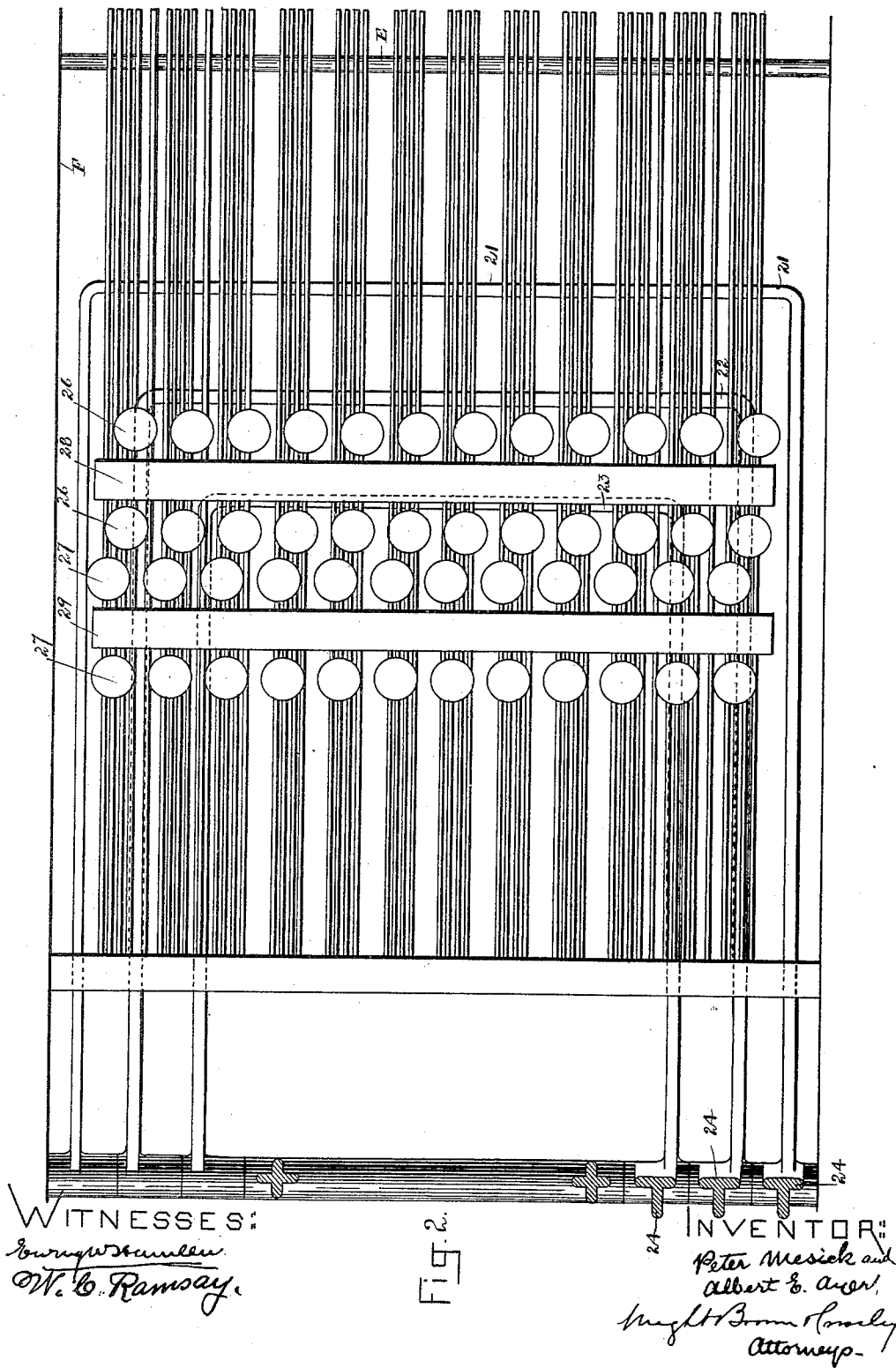
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5 Sheets—Sheet 2.

P. MESICK & A. E. AYER.
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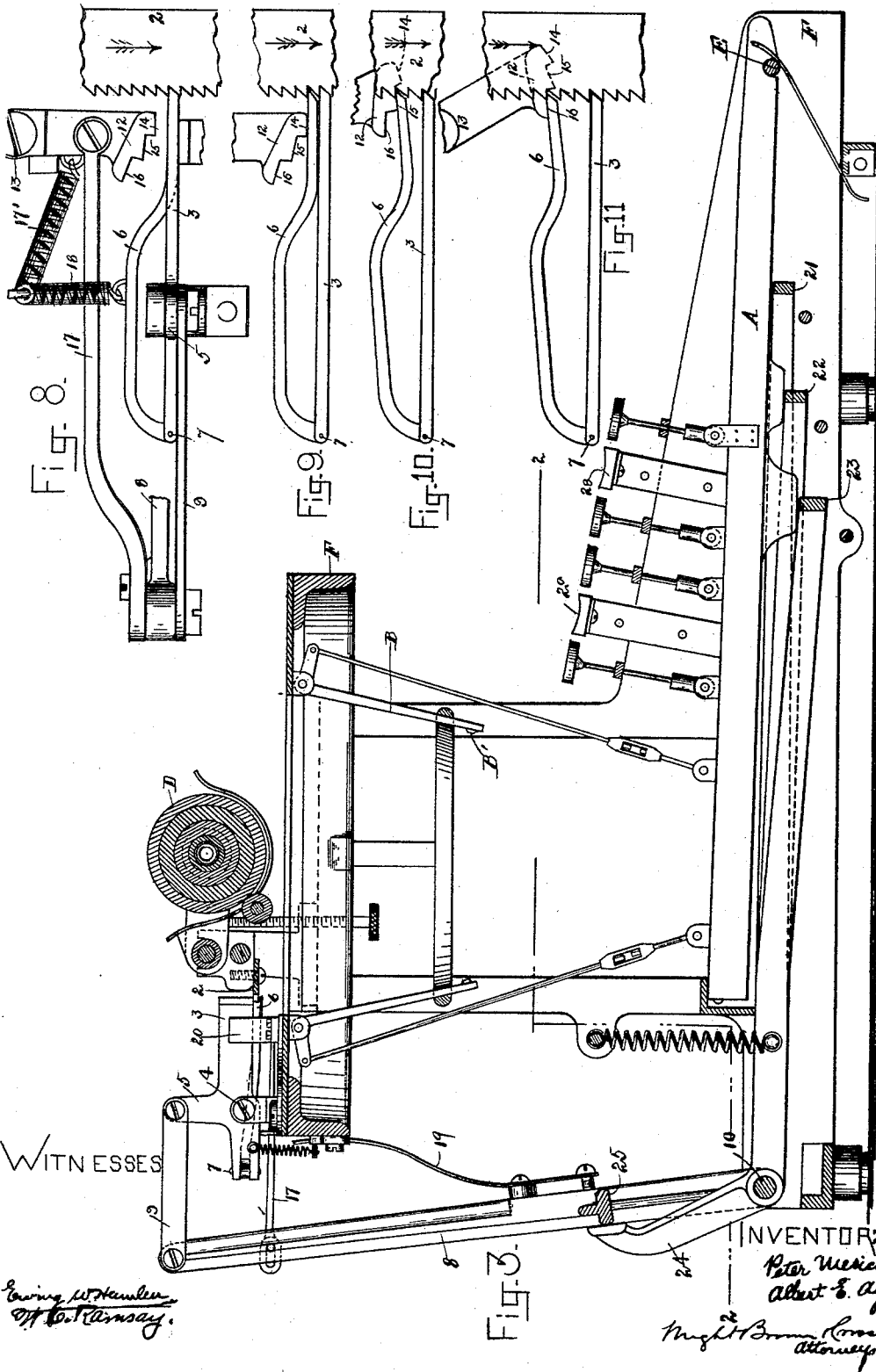
(No Model.)

5 Sheets—Sheet 3.

P. MESICK & A. E. AYER.
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Patented Dec. 9, 1890.



WITNESSES

*James H. Hambley
Wm. H. Ramsay.*

Fig. 3

INVENTOR:
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*Myatt Brown Comely
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(No Model.)

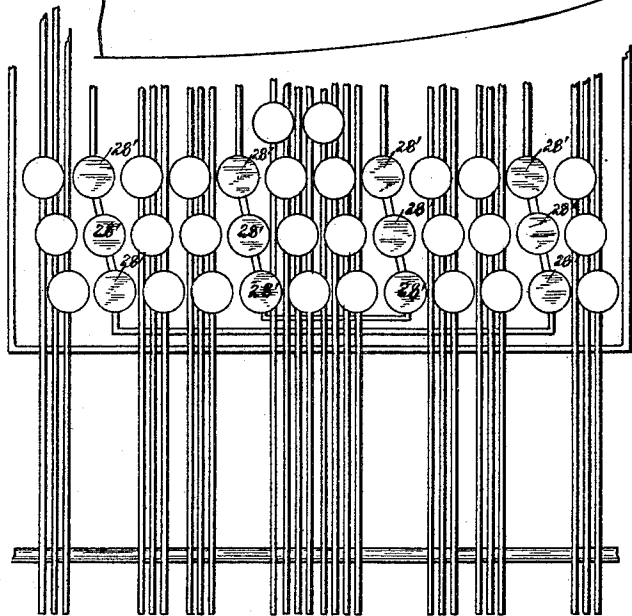
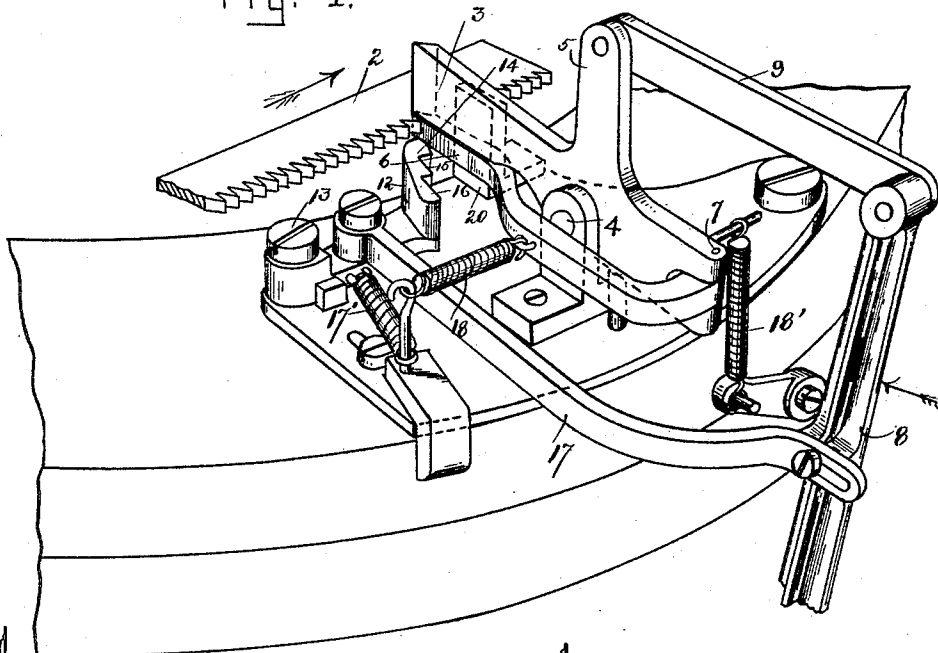
5 Sheets—Sheet 4.

P. MESICK & A. E. AYER.
TYPE WRITING MACHINE.

No. 442,323.

Patented Dec. 9, 1890.

Fig. 4.



WITNESSES: Fig. 5.

James W. Hamlen.
W. L. Ramsay.

Fig. 6.

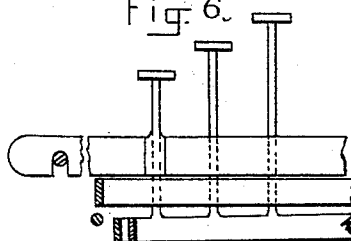
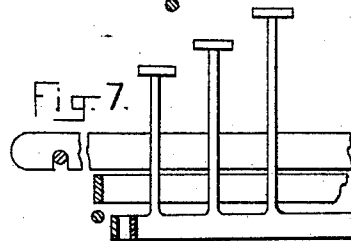


Fig. 7.



INVENTOR:

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(No Model.)

5 Sheets—Sheet 5.

P. MESICK & A. E. AYER.
TYPE WRITING MACHINE.

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Fig. 12.

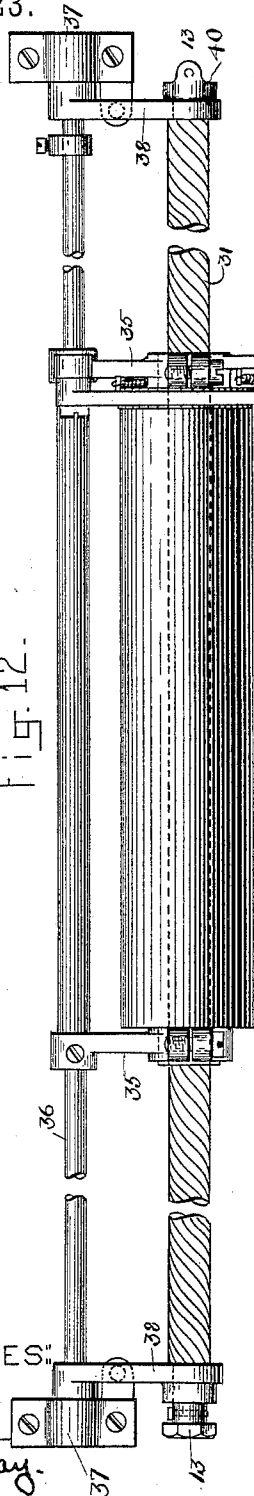


Fig. 13.

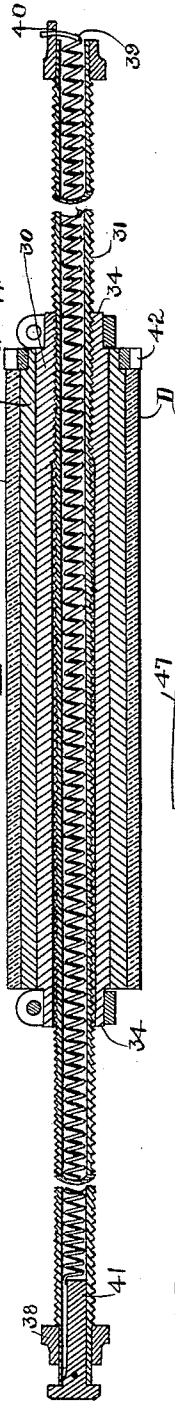
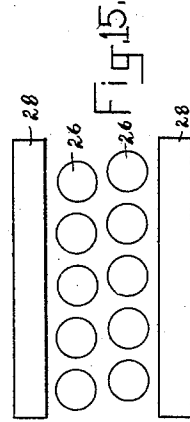
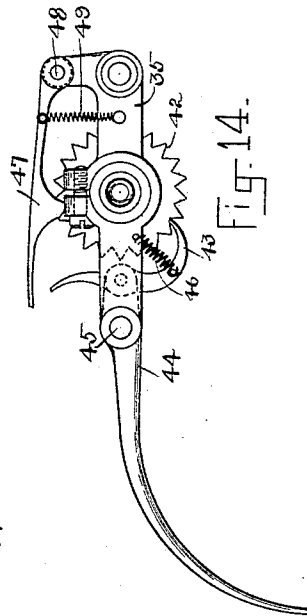


Fig. 14.



WITNESSES:

Burroughs & Hamden

W. C. Ramsay.

INVENTOR:

*Peter Mesick and
Albert E. Ayer,*

*By H. B. Brown & Co.,
Attorneys.*

UNITED STATES PATENT OFFICE.

PETER MESICK, OF STUYVESANT, NEW YORK, AND ALBERT E. AYER, OF BOSTON, MASSACHUSETTS, ASSIGNORS TO EIZABETH H. MESICK, OF STUYVESANT, NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 442,323, dated December 9, 1890.

Application filed March 4, 1890. Serial No. 342,679. (No model.)

To all whom it may concern:

Be it known that we, PETER MESICK, of Stuyvesant, in the county of Columbia, State of New York, and ALBERT E. AYER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates, chiefly, to type-writing machines of the class in which the paper is held on a carriage which is impelled longitudinally by a suitable motor when released by the depression of the type-keys and spacing devices, said carriage having a paper-supporting roll which is adapted to be rotated to move the paper forward after the printing of each line.

The invention has for its object to provide certain improvements in type-writing machines whereby the rapidity of operation, as compared with standard machines now in use, may be considerably increased without sacrificing simplicity and durability of construction and ease of operation.

To these ends the invention consists in the improvements, which we will now proceed to describe and claim.

In the accompanying drawings, forming a part of this specification, Figure 1 represents a rear elevation of the type-writing machine embodying our improvements. Fig. 2 represents a plan view of the key-board, space-bars, and the space and key levers operated thereby, together with portions of the supporting-frame of the machine, various parts which are of well-known construction being omitted for the sake of simplicity and clearness. Fig. 3 represents a vertical section on the plane of line 3 3 of Fig. 1. Fig. 4 represents a perspective view of the escapement mechanism of the machine. Fig. 5 represents a plan view of the key-board, showing a different arrangement of spacing devices from those shown in Fig. 2. Figs. 6 and 7 represent side views of the arrangement shown in Fig. 5. Figs. 8, 9, 10, and 11 represent top views of the escapement mechanism shown in Fig. 4, said mechanism being shown in different positions. Fig. 12 represents a

plan view of a portion of the machine, showing the paper-carriage and its paper-supporting roll and our improved means for impelling the carriage when it is released by the escapement. Fig. 13 represents a section on line 13 13 of Fig. 12. Fig. 14 represents an end elevation of the parts shown in Fig. 12. Fig. 15 represents a modified form of keyboard.

The same letters of reference indicate the same parts in all of the figures.

In the drawings, F represents the frame of a type-writing machine, which may be of any suitable construction, and although we have shown the frame as of the general form of the well-known "caligraph" machine, we do not limit ourselves to this form.

The pivoted type-levers B, which carry the types or printing characters B' at their swinging ends, may be arranged in any suitable manner, and they are pivoted, as usual, to the frame of the machine, said levers being arranged to present their types at a point common to all the levers to the paper supported by the roll D of the paper-carriage.

The key-levers A, to which the type-keys hereinafter referred to are connected, are mounted to oscillate on a stud or cross-bar E, attached to the frame, and are connected, as usual, by rods with the type-levers.

The paper-carriage is mounted to move on guides on the frame and may be of any suitable construction. To said carriage is connected the horizontal bar 2, the outer end of which is provided with ratchet-teeth, said bar and the devices hereinafter described co-operating with said teeth, constituting the escapement of the carriage, whereby the carriage is moved step by step after the depression of the keys and space-bars, as hereinafter described.

Any suitable arrangement of impelling-spring may be employed to impel the carriage endwise and give it the necessary spacing movements, the length of which is regulated by the escapement. We have shown and hereinafter described the impelling-spring as arranged in the paper-supporting roll and operating a quick-thread screw which gives

the carriage its endwise-feeding movement; but we do not desire to be understood as limiting ourselves to said arrangement, as any of the well-known arrangements of an impelling-spring to give the carriage its endwise movements may be adopted without departing from the spirit of our invention.

The parts of the escapement that co-operate with the ratcheted bar 2 are as follows, viz: a dog 3, pivoted at 4 to a fixed ear or bracket on the supporting-frame and having an arm 5; a secondary dog 6, pivoted at 7 to the rear end of the dog 3 and arranged to swing both vertically with the dog 3 and horizontally independently of said dog; a lever 8, pivoted at 10 to the frame of the machine, and connected by a link 9 to the arm 5; a horizontally-movable stop or abutment 12, pivoted at 13 to the supporting-frame, and having a series of faces 14, 15, and 16 arranged to support the dog 6 at different distances from the dog 3, and a link 17, connecting the abutment 12 with the lever 8. The lever 8 is arranged to be moved forward in the direction indicated by the arrow in Fig. 4 by the depression of either of the type-keys or space-bars hereinafter referred to, and when so moved it depresses the ratchet-engaging ends of the dogs 3 and 6, thus engaging the dog 3 with one of the teeth of the bar 2, and at the same time depressing the dog 6 below said bar, the dog 6 being thereby released from the ratchet-teeth, so that it is free to be drawn by a spring 18 against one of the faces of the abutment 12. 17' is a spring which holds the abutment 12 in its normal position (shown in Fig. 4) until said abutment is thrown forward by the link 17.

18' is a spring which assists to quickly raise the dogs when the lever 8 returns to its normal position. (Shown in Fig. 4.) The lever 8 is capable of being thrown forward at different distances by the operation of different type-keys and space-bars, one series of type-keys being arranged by their depression to give the lever 8 its shortest movement, thereby causing said lever to hold the abutment 12 in position to cause its face 14 to support the dog 6, said dog being thus held at a distance from the dog 3 equal to the width of one tooth of the bar 2. When the depressing-key or space-bar is released, a spring 19 forces the lever 8 backwardly, thus raising the dogs 3 and 6 and causing the dog 3 to rise above the ratchet-bar 2 and the dog 6 to engage the tooth of the ratchet next to the tooth previously held by the dog 3. As soon as the dog 3 has risen above the ratchet the latter is released and is impelled by its impelling-spring in the direction indicated by the arrow in Fig. 4, carrying with it the dog 6 (which, as already stated, is pivoted to move horizontally) until said dog is arrested by contact with a fixed stop 20 on the arm of the machine. The movement of the carriage which is thus permitted is equal to the length of one tooth of the ratchet-bar, which gives

one letter-space. When the lever 8 is moved by another series of keys or space-bars arranged to give said lever its next longer movement, the second face 15 of the abutment 12 is moved into position to arrest the dog 6 when it is depressed below the ratchet-bar, said dog being thus given a movement to the width of two teeth and standing in such position that when it is raised into engagement with the ratchet-bar it will engage the second tooth from the one held by the dog 3, the carriage being therefore given a movement equal to the length of two teeth of the ratchet-bar 2 when released by the upward movement of the dog 3. When the lever 8 is given its longest movement in the direction indicated by the arrow by the space-bar, hereinafter described, provided for that purpose, the face 16 of the abutment 12 is moved into position to arrest the dog 6, which is thereby permitted to move a distance equal to the length of three teeth from the dog 3, so that when the dog 6 rises it engages the third tooth from the last engaged by the dog 3 and permits the three-step movement of the carriage.

It will be seen that the described escapement constitutes at once a simple and effective means for producing a word-space simultaneously with the operation of a terminal letter-key and permits the spacing-bar to be operated simultaneously with any type-key, so that the operator is enabled by one movement to print the last letter of a word and cause the spacing movement of the paper-carriage to give the required space between the said word and the next, the rapidity of operation of the machine, as compared with other standard machines, being thereby considerably increased.

In the organized machine here shown we employ three levers 21, 22, and 23 for giving the lever 8 and the escapement mechanism operated thereby the described variable movements, the lever 21 being arranged to give the lever 8 its shortest forward movement, the lever 22 its next longer or two-space movement, and the lever 23 its longest or three-space movement. Said levers are of the rectangular form shown in Fig. 2, each extending across and under the key-levers and space-bar levers by which it is to be operated. Said levers are mounted to oscillate upon the pivot-bar 10, which is common to them all, and each lever is provided with an upwardly-extending arm 24, said arm bearing upon a cross-bar 25, formed on or attached to the lever 8, so that the depression of either lever 21 22 23 causes its arm 24 to force the lever 8 forward in the direction indicated by the arrow in Fig. 4.

We have shown two series of type-keys. The keys 26 of one series are connected with the key-levers A, which are arranged to bear upon the lever 21. Hence the depression of either key 26 will give the lever 8 its shortest or single-space movement. The keys 26 may be of any desired number, and the type-levers

B, to which they are connected, are preferably made as shown in Patent No. 365,372, granted to A. G. Donnelly June 27, 1887, each having a plurality of printing characters on its swinging end and being adapted to be partially rotated to bring either of its characters into operative position, means being provided—such, for example, as are shown in said patent—whereby the operator can adjust said levers simultaneously, so as to bring either upper or lower case characters into position to print, thus enabling the same series of keys and type-levers to be used for upper and lower case characters. As each key 26 causes the printing of but a single character at a time, it is necessary that the depression of each of said keys shall give the carriage only a single-space movement. Hence said keys, as already described, are arranged to bear only on the lever 21, which, as stated, gives the escapement actuating-lever 8 its shortest or one-space movement.

The other series of type-keys 27 are connected to type-levers, each of which is provided with a plurality of characters arranged to be impressed simultaneously upon the paper, said type-levers bearing, for example, such combinations as es, ed, er, no, on, of, or, ng, at, an, as, in, is, it, th, and any other combination of letters which are commonly used consecutively. As the characters on the type-levers operated by the keys 27 require more space than the characters on the levers operated by the keys 26, we have arranged the keys 27 to actuate the lever 22, which gives the escapement operating-lever 8 its two-space movement, so that when either of the keys 27 is depressed and released the carriage will be moved two spaces.

In connection with the two series of type-keys we employ two space-bars 28 29, which are arranged to effect different spacing movements of the carriage. The space-bar 28 is arranged to act on the lever 22, and gives a two-space movement; but the space-bar 29 is arranged to act on the lever 23, which gives the three-space movement.

From the foregoing it will be seen that the depression of the space-bar 28 simultaneously with the depression of either of the keys 26 will give the carriage a two-space movement, so that the operator in printing the last letter of the word may at the same time effect the movement which creates a space between said word and the next, thus avoiding the loss of time which is involved in making a separate movement to effect the spacing between words. In the same way the depression of the space-bar 29 simultaneously with either of the keys 27 will effect the spacing between a word, the last two letters of which have been printed by one of the double-type keys and the succeeding word.

We do not limit ourselves, so far as the capability of the machine for simultaneous final letter printing and spacing is concerned, to the arrangement of two-space and three-

space mechanism here shown and described, as, if desired, the machine may contain only one series of keys and the accompanying space-bar instead of two series of keys and two-space bars; or, if desired, the machine may have more than two series of keys and more than two-space bars, although such an arrangement is not believed to be desirable, because involving too great complication.

An important feature of our invention is the arrangement of the space-bars so that every type-key of the key-board controlling a terminal letter will be in such close proximity to a space-bar that a word-spacing movement can be effected without moving the hand from the position occupied in depressing any type-key to print a terminal letter. In other words, the space-bar and key may be struck simultaneously and with the fingers of one hand. A suitable arrangement for this purpose is shown in Fig. 2, in which two space-bars 28 29 are located at opposite sides of two rows of keys, said space-bars extending in the direction of the greatest length of the key-board. Another arrangement is shown in Fig. 5, in which a series of rows of connected keys 28' are employed, each row being attached to a lever, which communicates the desired spacing movements to the escapement mechanism. Said rows of keys, which constitute the equivalents of space-bars, are arranged crosswise of the key-board, each of said rows of keys or space-bars being separated from the next by two rows of type-keys. It will be seen that either of these arrangements permits the depression of a space-bar without removing the hand from the position it occupies in depressing any type-key, so that no pause or delay is required in producing a word-space, as there would be if a movement of the hand from the key of a terminal letter to a space-bar were required, or if the arrangement were such that the word-spacing movement could not be produced by the hand that is in position to depress the terminal-letter key.

This improvement relating to the key-board of a type-writer may be used in connection with any suitable escapement mechanism, and each of the two space-bars 28 and 29 (shown in Fig. 2) may be adapted to produce the same spacing movement that is produced by the other, instead of being adapted, as here shown, to produce different spacing movements. In the example shown in Fig. 5 the keys 28', substituted for the space-bars, are all arranged to produce the same effect that is produced by the space-bar 28 of Fig. 2—viz., the two-space movement of the carriage—but it will be understood that when two series of type-keys are employed, as described in connection with the preceding figures, there will be another series of space-bars or space-operating keys arranged to give the three-space movement to the carriage. It will be seen that by thus arranging the space-bars so that any key of the board will be adjacent

to a space-bar the convenience of the machine and the possibility of rapid operation are increased.

We do not limit ourselves in all cases to the interposition of a space-bar between the two rows of type-keys, as a similar result may be obtained by employing two space-bars located at opposite sides of the key-board and both outside of the space in which the keys are arranged, as shown in Fig. 15, both space-bars being in this case arranged to give the same spacing movement. The advantage of this arrangement over the use of the single space-bar located at the side of the key-board nearest the operator is the superior convenience it affords in spacing when the last letter of the word is printed by the depression of a key in the upper row, or the one farthest from the operator.

The paper-carrying roll D, which we have here shown, is of peculiar construction, the same forming a part of our invention. Said roll is composed of an inner cylindrical section 30, which is internally screw-threaded for a portion of its length, and is engaged with a quick-thread screw-shaft 31, hereinafter referred to, a middle section 32, of wood or other suitable material, surrounding the section 30, said section 32 being adapted to be rotated on the section 30, and, without rotating the latter, to feed the paper endwise, and thus form the spaces between lines, and an outer or inclosing section 33, of rubber or other suitable material, preferably of a somewhat yielding nature, to sustain the impact of the type, although said inclosing-section 33 may be rigid, if preferred, or may have any desired degree of yielding quality. The inner section 30 has its ends reduced and formed as bearings 34 34, which are journaled in sockets formed in the swinging arms 35 35 of the carriage, said arms being mounted both to slide and to oscillate on a guide-rod 36, which is mounted in bearings 37 37, affixed to the frame of the machine. The screw-shaft 31 is fitted to rotate in bearings formed in arms 38 38, which are affixed to the guide 36, and are adapted to oscillate so that the screw-shaft and the roll D thereon can be raised or lowered, as usual, to permit the inspection of the work. The screw-shaft 31 is tubular and contains a spiral spring 39, one end of which is attached to an ear 40, formed on one of the arms 38, while the other end is attached to the screw-shaft in any suitable way, preferably by means of a plug 41, inserted in one end of the screw-shaft and rigidly attached thereto, said plug having a groove in one side which receives one end of the spring 39, as shown in Fig. 13. This arrangement of the spring gives it a constant tendency to rotate the screw-shaft 31 in the direction required to cause the quick screw-threads thereon, by their engagement with the internally-threaded section of the roll, to impel the roll in the direction indicated by the arrow in Fig. 13, thus giving the paper the feed move-

ment to form the letter and word spaces whenever the escapement is operated to release the carriage, as already described. The spring is of course partially unwound during the printing of each line and is rewound by the return movement of the carriage to its starting position, the screw-thread connection between the inner section of the roll and the shaft 31 causing said shaft to be rotated backwardly when the carriage and roll are being moved to their starting position by the operator after the printing of each line. The section 32 of the roll, as already described, is adapted to rotate upon and independently of the section 30, so that the periphery of the roll can be rotated to move the paper to form the spaces between lines without rotating the inner section 30, it being obviously necessary that the section 30 should remain at rest while the paper is being moved forward, because the rotation of the section 30 necessarily involves the endwise movement of the roll upon the screw-shaft 31.

To the sections 32 and 33 is affixed a spur-wheel 42, the teeth of which are formed to be engaged by a dog 43, which is pivoted to a lever 44, the latter being pivoted at 45 to one of the oscillating arms 35 of the carriage. The dog 43 is held by a spring 46 against the periphery of the spur-wheel 42, and when the lever 44 is depressed said dog by its engagement with the spur-wheel rotates the roll D in the direction required to carry the paper forward to form the spaces between the lines.

47 represents a detent-dog, which is pivoted at 48 to an ear on one of the arms 35 and is held by a spring 49 in contact with the periphery of the spur-wheel 42. Said dog 47 prevents loose or idle rotation of the roll D in either direction, as usual in machines of this class.

By reference to Fig. 14 it will be seen that the handle ends of the dogs 43 and 47 are located in close proximity to each other, so that both can be moved simultaneously by the operator's thumb in the direction required to disengage said dogs from the spur-wheel 42, thus enabling the roll D to be rotated freely in either direction.

It will be seen that by the employment of the quick thread-screw and the impelling-spring therefor arranged to be wound by each return movement of the carriage the means for impelling the carriage are reduced to a compact form and the machine as a whole is considerably simplified.

We do not wish to be understood as claiming herein, broadly, the combination, with the substantially parallel proximate rows of keys, of space-keys operating to feed the carriage a greater distance than said character-keys and arranged in proximity to each row of the latter.

We claim—

1. In a type-writer, the combination, with the key-board composed of a series of substantially parallel proximate rows of keys, of space-bars or their specified equivalents oper-

ating to feed the carriage a greater distance than said keys, said space-bars being interposed between the rows of keys and in proximity to each of the latter, whereby any terminal letter and the space-bar adjacent thereto may be simultaneously depressed by a single movement of one of the operator's hands to print said letter and give the word-space, substantially as described.

2. In a type-writer, the combination, with the paper-carriage having a variable escapement-feed and independent series of key-levers controlling said feed, whereby the carriage is moved a greater or less distance, of independent word-space bars for each of said independent series of key-levers and each operating to move the escapement-feed a greater distance than any of its particular series of key-levers, whereby a key-lever of any series and its word-space bar may be operated simultaneously to print the character and give a word-space, substantially as described.

3. In a type-writer, the combination, with the paper-carriage having variable escapement-feed, of two series of key-levers, one for single characters and operating to feed the escapement a single space and the other for more than one character and operating to feed the escapement more than one space, and two word space-bars, one for each series of key-levers and each operating to give the escapement a greater feed than any of its series of key-levers, whereby any of either set of key-levers and its space-bar may be operated simultaneously to print the characters and give a word-space, substantially as described.

4. In a type-writer, the combination, with the paper-carriage having a ratchet-bar, two spacing-dogs movable crosswise of said bar, one of said dogs being movable lengthwise thereof to feed the carriage forward, and the key-levers, of a movable stop for limiting the movement of the dog lengthwise of the bar, an arm or lever operated by the key-levers and controlling the crosswise movement of the dogs, and a connection between said arm and the movable stop, whereby the stop is adjusted by the movement of the dog-controlling arm or lever, substantially as described.

5. In a type-writer, the combination, with the paper-carriage having a ratchet-bar, two spacing-dogs movable crosswise of said bar, one of said dogs being movable lengthwise thereof to feed the carriage forward, and two

series of key-levers for one or more characters requiring different spacing, of a movable stop for limiting the movement of the dog lengthwise of the bar, an arm or lever operated by said key-levers and given a greater throw by one series than by the other, and a connection between said arm or lever and the movable stop, whereby the feed may be properly gaged by the operation of the key-levers of either series, substantially as described.

6. In a type-writing machine, the combination of a paper-carriage having a ratchet-bar, two spacing-dogs 3 and 6, both of which are movable crosswise of said bar, one of said dogs being movable lengthwise thereof, a pivoted arm, as 12, having a series of faces and constituting a movable stop or abutment, against which the independently-movable dog is forced by a spring when said dog is disengaged from the ratchet-bar, an oscillatory lever 8, connected by intermediate devices with the type-keys and space bar or bars of the machine, and by a link 9 with the dog 3, and a rod or link 17, connecting the lever 8 with the stop-arm 12, as set forth.

7. In a type-writing machine, the combination of a carriage, a variable escapement having a stop adapted by its position to determine the spacing movements caused by the operation of the escapement, a lever 8, connected with said stop and controlling the position thereof, and a series of independent levers, as 21, 22, and 23, arranged to operate said lever 8 independently, said levers being operated by the type-keys and space bar or bars of the machine, as set forth.

8. A paper-supporting roll composed of inner and outer tubular sections, the latter being adapted to rotate independently, the inner section having an internal screw-thread, combined with a quick-thread tubular screw-shaft passing through the roll, and a spring attached at one end to said shaft and at the other end to a non-rotating support, whereby said spring is caused to rotate the shaft, and thereby impel the carriage, as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 17th day of February, A. D. 1890.

PETER MESICK.
ALBERT E. AYER.

Witnesses:

EWING W. HAMLEN,
ARTHUR W. CROSSLEY.