

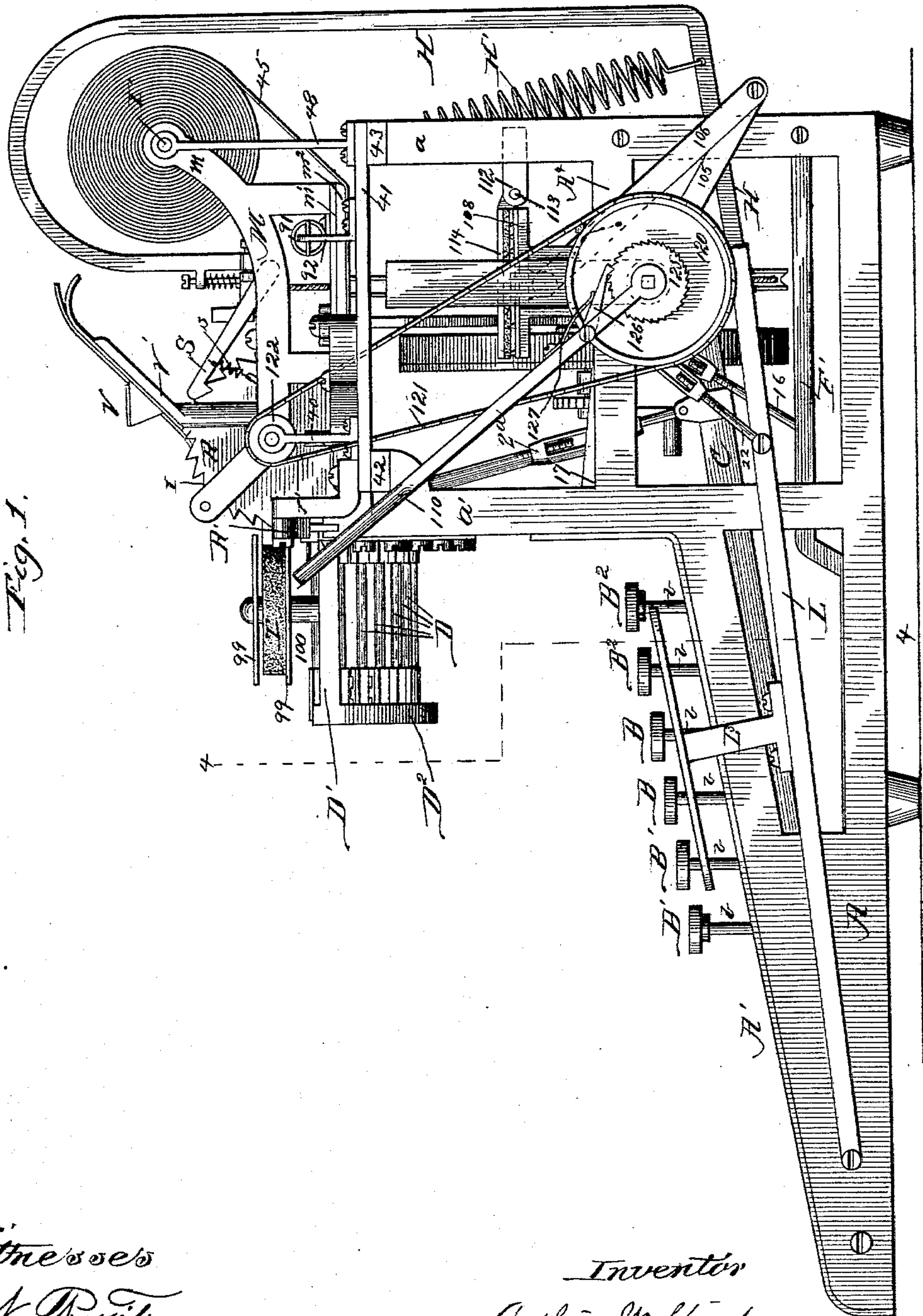
(No Model.)

5 Sheets—Sheet 1.

A. W. STREET.  
TYPE WRITING MACHINE.

No. 561,834.

Patented June 9, 1896.



Witnesses

W. Rosier  
Fred. H. Mills

Inventor

Arthur W. Street  
By Price & Fisher  
Attys.



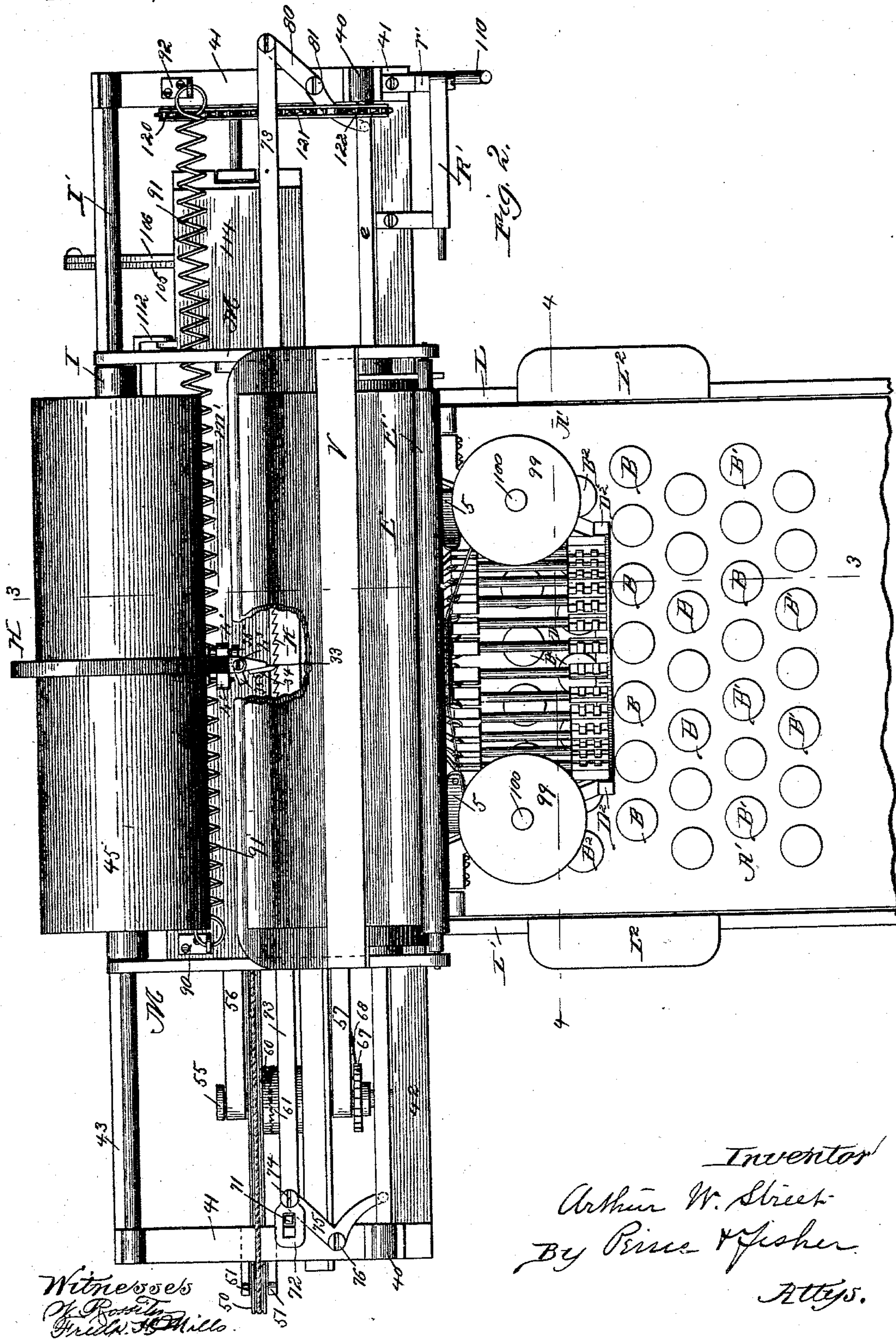
(No Model.)

5 Sheets—Sheet 2.

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5 Sheets—Sheet 3.

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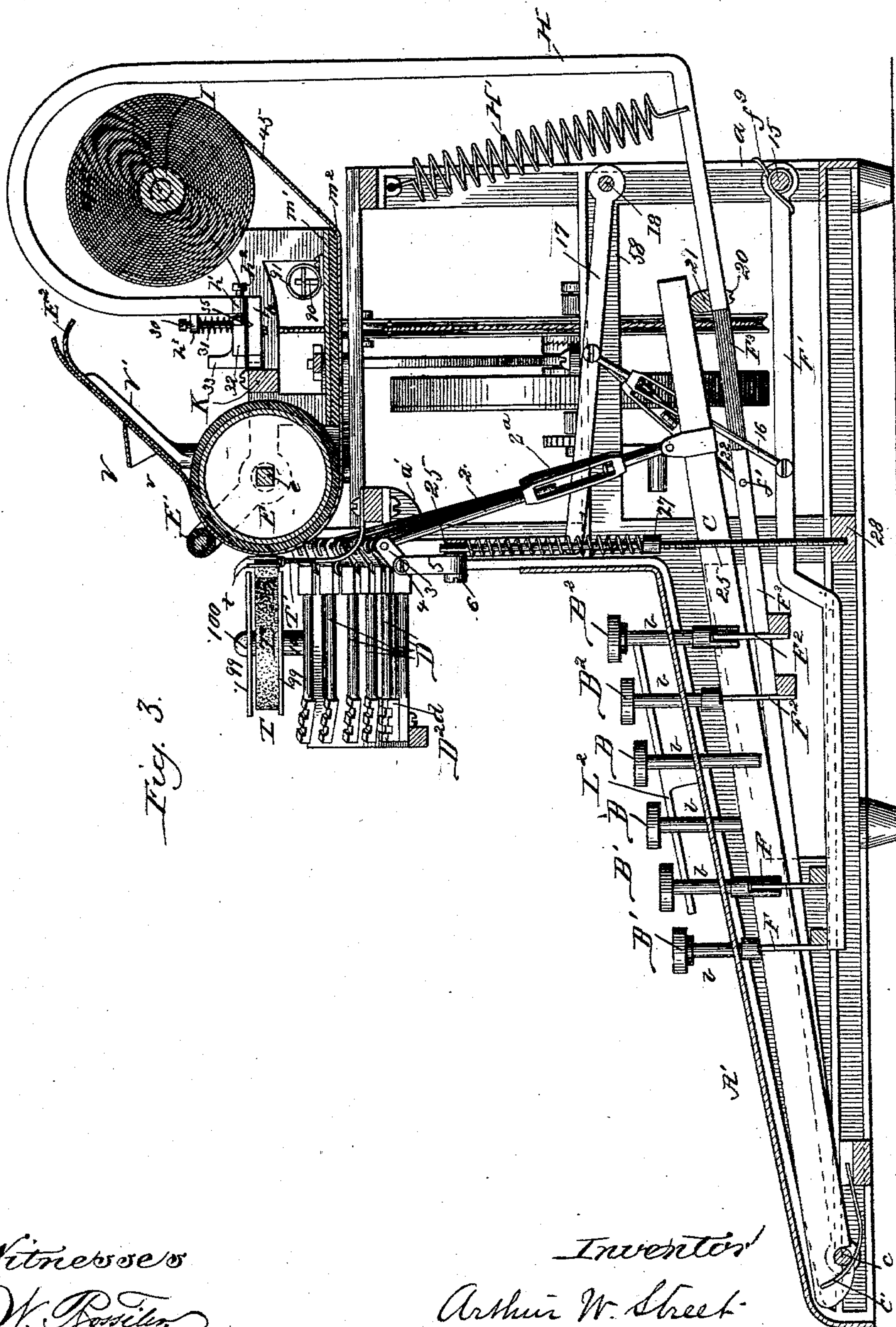


Fig. 3.

Witnesses  
W. R. Smith  
Fred H. Mills

Inventor  
Arthur W. Street  
By Price Fisher  
Attys.



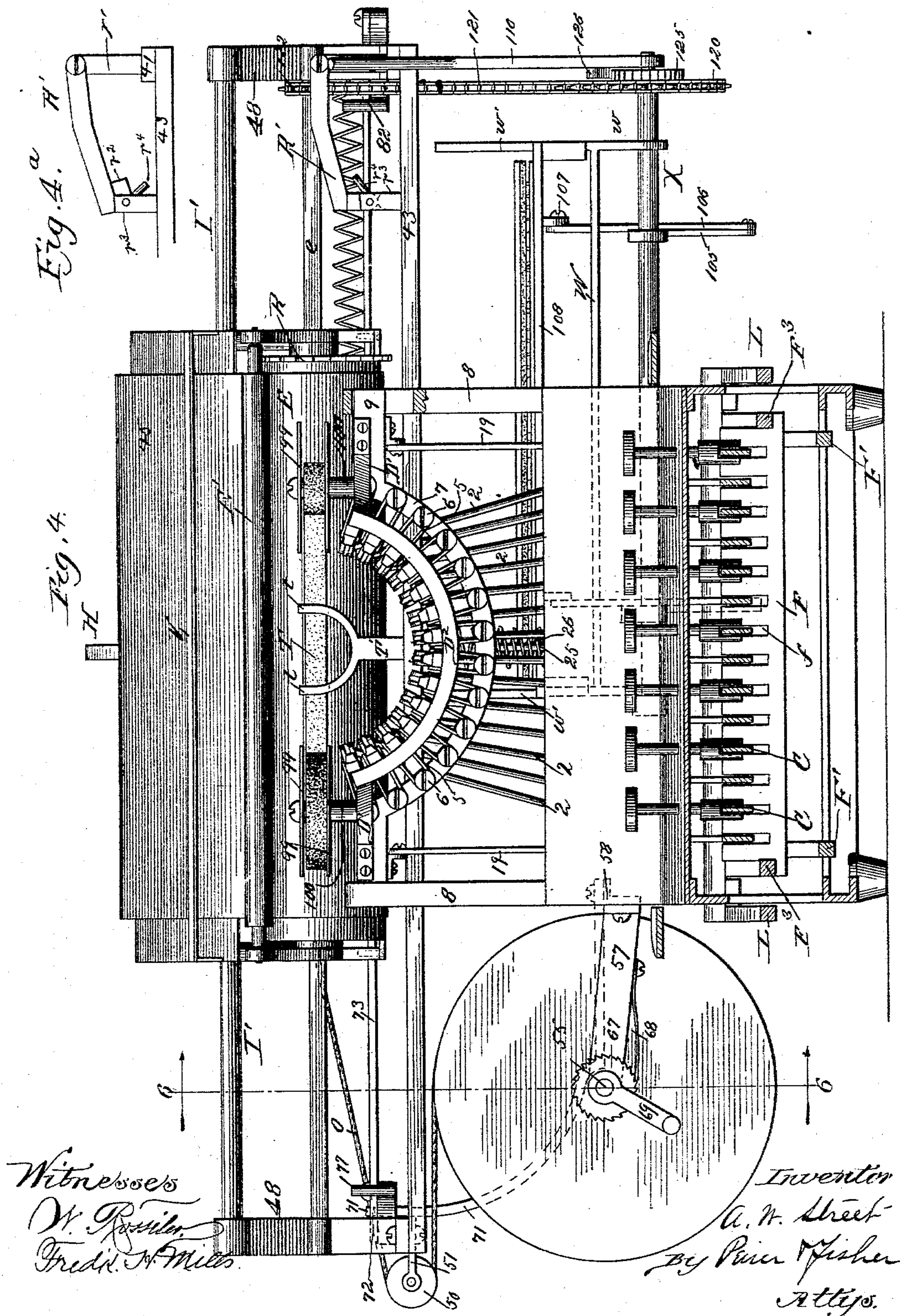
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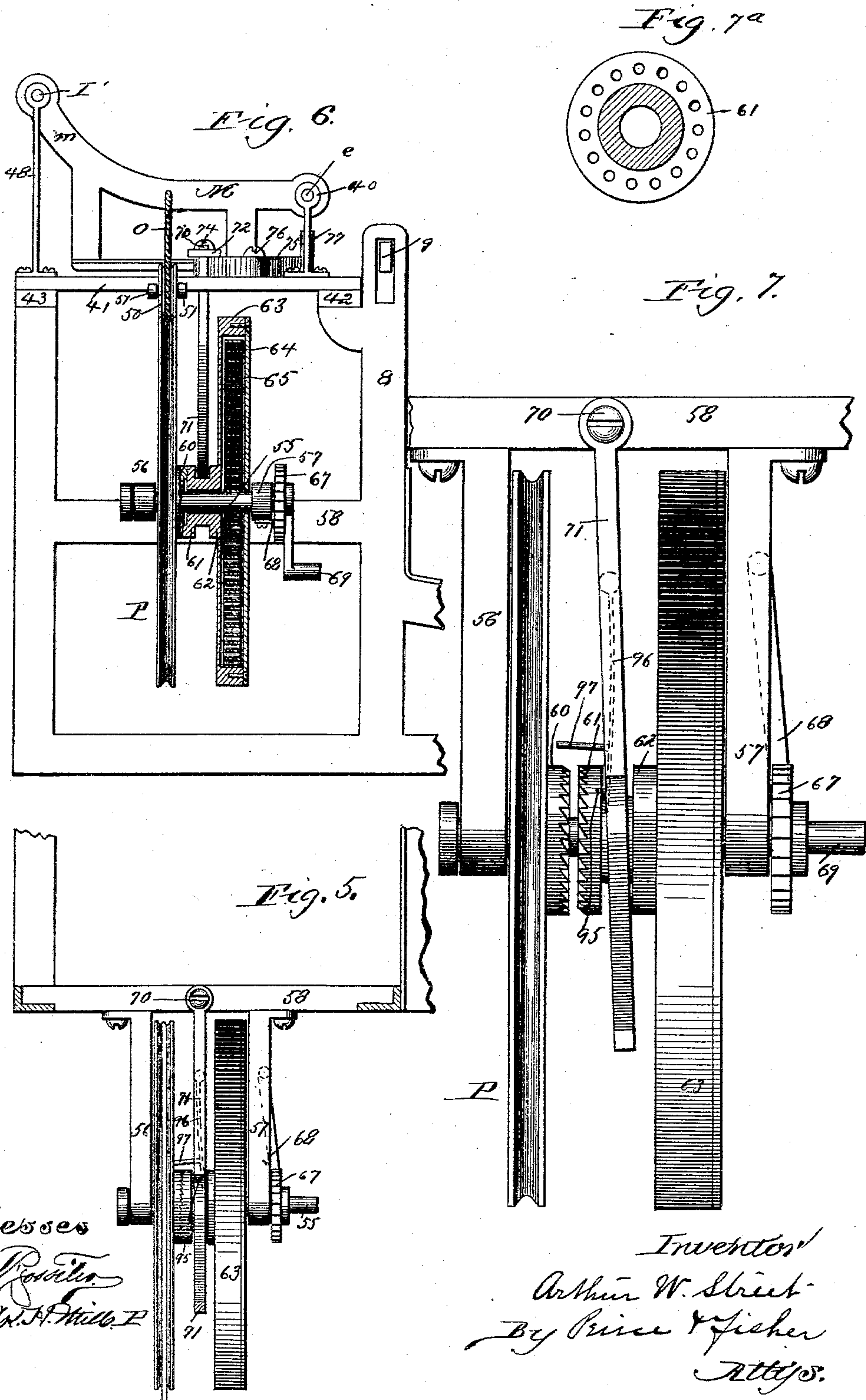
(No Model.)

5 Sheets—Sheet 5.

A. W. STREET.  
TYPE WRITING MACHINE.

No. 561,834.

Patented June 9, 1896.



Witnesses  
W. P. R. [Signature]  
Fred. S. [Signature]

Inventor  
Arthur W. Street  
By Price & Fisher  
Attys.



# UNITED STATES PATENT OFFICE.

ARTHUR W. STREET, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-THIRD TO  
SANFORD C. MCKNIGHT, OF SAME PLACE.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 561,834, dated June 9, 1896.

Application filed March 22, 1890. Serial No. 344,882. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR W. STREET, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Type-Writing Machines, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

Figure 1 is a view in side elevation of a type-writer embodying my improvements. Fig. 2 is a plan view. Fig. 3 is a view in vertical cross-section on line 3 3 of Fig. 2. Fig. 4 is a view in vertical section on line 4 4 of Fig. 1. Fig. 4<sup>a</sup> is an enlarged detail view of the inclined bar R for effecting the line-space and its adjacent parts. Fig. 5 is a view in horizontal section through the frame at one end of the machine, showing in elevation the casing of the carriage-actuating spring and the clutch mechanism and adjacent parts. Fig. 6 is a view in vertical section on line 6 6 of Fig. 4, parts being shown in elevation. Fig. 7 is a view in elevation of the parts shown in Fig. 6, but on an enlarged scale and in different position. Fig. 7<sup>a</sup> is a detail view, in vertical section, through the clutch-collar 62, showing the inner side of the section 61 of the clutch.

A designates the main frame of the machine, the front portion of which is provided with a keyboard A', through suitable perforations in which project the stems b of the finger-keys B, B', and B<sup>2</sup>. Beneath the keys B, B', and B<sup>2</sup> extend a series of key-levers C, each of these key-levers C being connected by a divided rod 2 with the short end 3 of a type-bar D, this type-bar being pivoted, as at 4, to a bracket 5, that is fastened, as by a set-screw 6, to a circular frame 7, that is sustained by the uprights 8 of the main frame. The divided sections of the rod 2 are united by means of a turnbuckle 2<sup>a</sup>, screwed to the lower end of the upper section of the rod, the upper end of the lower section of the rod passing through the lower part of the turnbuckle and being provided with a head, as seen in Fig. 3. The purpose of thus forming the connecting-rods 2 of divided sections is to permit the type-bar-carrying frame to be shifted by any one of the key-levers without thereby

causing the movement of the remaining type-key levers. Hence it will be seen that whenever a key-lever C is depressed by the operation of a key B it will cause the corresponding type-bar D to swing about its pivot-point 4, in order to throw the type-carrying end of the type-bar D against the paper-carrying roll E, as will hereinafter be more fully explained.

The circular bar 7 is provided with laterally-projecting portions 9, that are held in a manner free to move in vertical direction by the standards 8 of the main frame, my purpose in thus mounting the circular frame 7, which carries the type-bars in such manner that it can be moved up and down, being to enable the type-bars to be shifted in order to cause either one of the several type *d* upon their ends to be brought to proper position to make its impression upon the paper-carrying roll E.

Each of the type-bars D in the construction shown is illustrated as provided with the three type *d*, and it is obvious that in order to bring each of these type into position for effecting its impression upon the paper two shifts or movements of the frame 7 must be effected—that is to say, if it be assumed that the innermost types *d* of the type-levers D are in position to print when the frame 7 is in its extreme vertical position, (illustrated in the drawings,) then in order to enable the middle type *d* to print it will be necessary to move the frame 7 that carries the type-bars D downward a sufficient distance to insure the accurate striking of these middle type at a proper point upon the paper-carrying roll; and so, also, when it is desired to cause the outermost type *d* of the series to print it is necessary to move downward the frame 7 a still greater distance. Thus, for example, if there be fourteen type-bars D, each carrying three type *d*, the machine will be capable of printing forty-two different characters; but while fourteen of the finger-keys B can operate the type-bars D without the necessity of shifting the frame 7, by which these type-bars are sustained, it will be necessary that fourteen of the remaining finger-keys shall be provided with suitable means whereby the frame 7 shall be shifted to such position as to enable the middle type *d* of the type-bars to



print, and that fourteen other keys shall be provided with suitable mechanism whereby the shifting of the frame 7 shall be effected to permit the outermost type *d* of the type-bars to make their impressions. Hence it is that fourteen of the keys (designated as B) have their stems *b* connected simply to the key-levers C, these levers being pivoted at their front ends to a transverse rod *c*, and being pressed normally in upward direction by suitable springs *c'*. Thus it will be seen, by reference more particularly to Fig. 3 of the drawings, that if one of the keys B be depressed it will simply cause the depression of the corresponding key-levers C, the downward movement of the key-lever causing the connecting-rod 2 to force the type-bar D to swing about its pivot-point 4 and cause its innermost type *d* to effect its impression against the paper-carrying roll E. It will be observed, however, that each of the key-levers C has attached thereto not merely the key B, by which the impression from the innermost type *d* of the type-bar is effected, but has connected thereto also the keys B' and B<sup>2</sup>, by which the impressions of the middle and outermost type *d* of the type-bar D are effected, and the mechanism by which the shifting of the type-bar-carrying frame 7 is effected by the movement of these keys B' and B<sup>2</sup> will next be described.

The stem of the key B' has its lower portion provided with intersecting grooves, through one of which extends the key-lever C and through the other of which extends the transverse shifting-bar F, this bar being provided with suitable slots *f*, (see Fig. 4,) through which pass the key-levers C. The shifting-bar F has its outer ends attached to the shifting-levers F', preferably one at each side of the machine, these levers being pivotally connected, as at 15, to the rear standards *a* of the machine, and each of these shifting-levers F is connected by means of a suitable divided connecting-rod 16 with the arms 17, that are pivotally attached, as at 18, to the hangers 19, that depend from the outer end portions 9 of the type-bar-carrying frame 7. Hence it will be seen that when one of the keys of the series B' is depressed it not only serves to effect the downward movement of the key-lever C, in order to cause the corresponding type-bar D to be moved about its pivot-point, but at the same time this depression of the key B', by forcing downward the shifting-bar F and the shifting-levers F', causes the rods 16 and arms 17, by their connection with the type-bar-carrying frame 7, to move this frame downward a sufficient distance to cause the middle type *d* of the type-bar to strike at the proper point upon the paper-carrying roll E, and the parts will be so adjusted that this downward movement of the type-bar-carrying frame 7 shall be completed just before the key-lever C has so far completed its movement as to cause the striking of the type to make its impression. It is obvious that by the

adjustment of the connecting-rods 16, by means of which the shifting-levers F are joined to the swinging arms 17, the extent of downward movement that shall be imparted by each to the type-bar-carrying frame 7 can be determined with exactness. The stem *b* of each of the keys B<sup>2</sup> is the same in construction as the stems *b* of the keys B' and the stems of the keys B<sup>2</sup>, and not only straddle the key-levers C, but also the shifting-bars F<sup>2</sup>, that are provided with slots *f* similar to the slots of the shifting-bars F beneath the keys B'. Each of the shifting-bars F<sup>2</sup> is connected at its outer ends to the shifting-levers F<sup>3</sup>, the front ends of these levers being pivoted upon the transverse rod *c* at the front of the machine, while the rear ends of these levers are suitably fastened, as at 20, to the space-bar 21, that extends across the back of the machine beneath the rear ends of the key-levers C. Each of the shifting-levers F<sup>3</sup> has attached thereto, as at *f'*, a divided connecting-rod 22, that serves to unite this shifting-lever to the swinging arm 17, by which the downward movement of the type-bar-carrying frame 7 is effected.

The sections of the divided connecting-rods 22 and of the divided connecting-rods 16 above described are united by turnbuckles in the same manner as the sections of the type-lever-connecting rods 2, heretofore described, in order to allow the type-bar-carrying frame to be shifted by one of the shifting-levers without thereby disturbing the other shifting-levers. Suitable springs *f'* serve to hold the shifting-levers normally elevated.

Through the type-bar-carrying frame 7 loosely passes the upper end of a guide-rod 25, upon which is held a coiled spring 26, the upper end of which bears against the under side of the frame 7, while the lower end of this spring bears upon a nut 27 upon the rod 25, the lower end of this rod being conveniently held in a transverse bar 28, that extends from side to side of the machine. Hence it will be seen that when either of the keys B<sup>2</sup> is depressed it will serve not only to depress its corresponding key-lever C but will also effect the downward movement of the shifting-bar F<sup>2</sup>, the shifting-levers F<sup>3</sup>, and, through the medium of the connecting-rods 22, arms 17, and hangers 19, will insure the downward movement of the type-bar-carrying frame 7 to such extent as to cause the outermost type *d* of the type-bar D to make its impression. It will thus be seen that by the employment of comparatively few key-levers and type-bars a very large number of characters can be printed, and it is obvious that the type-bars may be furnished with two or more type as in practice may be found most expedient. From the ends of the shifting-frame 7 project suitable arms D', carrying the semicircular bar D<sup>2</sup>, whereon the outer ends of the type-bars D will bear when at rest.

The mechanism whereby the movement of



the paper-carrying roll E is effected to produce the proper space between letters and words will next be described.

To the center of the space-bar 21 is attached the pawl-carrier bar H, held normally in elevated position by the coiled spring H', this bar being suitably formed—for example, as shown in Figs. 1 and 3—so that it will clear the roll I, whereon is carried the paper to be printed or written upon. The upper end of the bar H has an outwardly-bent portion  $h$ , adjacent which project the lugs  $h^1$ , through which pass the set-screws  $h^2$ , and from the upper portion of the bar H extends a lug  $h^3$ , through which passes a screw-bolt 30, carrying a coiled spring 31, this spring having its upper end attached to the lug  $h^3$ , while its lower end is attached to the vibrating pawl 32, that is held in place in a manner free to vibrate by means of the screw-rod 30, that passes through its rear. From the rear end of this pawl 32 project the lugs or arms 35, that will contact with the ends of the set-screws  $h^2$ , by means of which the vibratory movement of the pawl 32 is determined. The end  $h$  of the bar H is shaped to correspond with the free end of the pawl 32, the free end of this pawl being preferably formed of a separate plate 33, suitably screwed, as at 34, to the body of the pawl 32, and the end  $h$  of the bar H forms, with the pawl 32, an escapement adapted to engage with the teeth of the rack-bar K, attached to the frame that sustains the paper-carrying roll E. This paper-carrying roll E and its frame is drawn from right to left of the machine by means of a spring, as will hereinafter more fully appear.

From the construction of parts as thus far defined it will be seen that when either of the key-levers C is depressed it will cause the downward movement of the space-bar 21 and a consequent downward movement of the pawl-carrier bar H. This downward movement of the pawl-carrier bar H will cause the end  $h$  of this bar to pass from out of engagement with the rack-bar K, but will bring the end 33 of the vibrating pawl 32 into engagement with the teeth of this rack-bar. At the same time the spring, by means of which the paper-carriage is drawn toward the left of the machine, will cause the vibrating pawl 32 to swing against the force of the spring 31 the limit of its movement, which will be the distance necessary to advance the machine properly for the next impression of a type, or the distance to effect the proper space between words. To the outer ends of the space-bar 21 are attached the spacing-levers L and L', one at each side of the machine, and provided with the striking-plate L<sup>2</sup>, so that by the depression of these levers L and L' the movement of the escapement mechanism sufficient to permit the advancing of the paper-carriage the proper distance to effect the space between words can be readily secured. The paper-carrying roll E is keyed upon a shaft  $e$ , that extends from side to side of the machine, and

is journaled in the brackets 40, that rise from the transverse bars 41, that extend between the longitudinal bars 42 and 43, that extend from side to side of the machine and are sustained by the standards  $a$  and  $a'$  of the main frame. The paper-carriage comprises the end plates or bars M, that are connected by the rack-bar K and by the transverse plate  $m'$ , to the under side of which is preferably fastened a platen-bed  $m^2$ , beneath and against which passes the paper strip 45 as it is unwound from the paper-carrying roll I, this paper strip passing over the roll E and beneath the presser-roll E' and over the guide-plate E<sup>2</sup> and beneath a tearing-bar V. The paper-carrying roll I is mounted in a manner free to slide and rotate upon a shaft I', that is journaled in the standards 48, that rise from the transverse bars 41 at the back of the machine, and from the end plates M of the paper-carriage extend the arms  $m$  that loosely encircle the shaft I' at each side of the paper-carrying roll I and serve to insure the lateral movement of this roll from side to side of the machine.

To the left-hand end of the paper-carriage is attached a traction-cord O, this cord passing over a suitable idler 50, sustained by arms 51 projecting from one of the transverse bars 41, and thence over the drum or pulley P, this drum or pulley being formed either as a circle or as a segment of a circle, mounted loosely upon a shaft 55, that is journaled within the arms 56 and 57 projecting from a transverse bar 58 at the left-hand side of the machine.

The pulley P, to which the cord O is attached, has connected thereto one section 60 of a clutch, the corresponding section 61 of this clutch being attached to a collar 62, that is mounted loosely upon the shaft 55 in a manner permitting it to slide and rotate thereon, as well understood in the art. The sections 60 and 61 are provided with the usual teeth upon their opposite faces, so that when the sections are brought together they will be caused to move in unison. To the collar 62 is affixed or formed in piece therewith the casing 63, wherein is held the coiled spring 64, a cap or plate 65 serving as a cover for the casing to exclude the dust. One end of the coiled spring 64 is fastened in any convenient manner to the shaft 55, while the opposite end of this spring is suitably attached to the casing 63. Upon a shaft 55 is keyed a ratchet-wheel 67, the backward movement of which is checked by a pawl 68, and to the end of this shaft 55 is fastened a crank-handle 69, whereby the turning of the shaft may be effected to secure the winding of the coiled spring 64.

From the foregoing construction it will be seen that when the coiled spring 64 is wound and the sections 60 and 61 of the clutch are in engagement, as seen in Figs. 5 and 6 of the drawings, the drum P will be subject to the force of the coiled spring 64, which will tend



to turn the casing 63, and consequently the collar 62, the clutch, and the drum P, in such manner as to cause the cord O to exert the force of the spring upon the paper-carriage and tend to move this carriage from right to left of the machine. When, however, the sections 60 and 61 of the clutch, by which the drum P is connected with the collar 62, are thrown out of engagement, the paper-carriage can be drawn backward to the right-hand side of the machine, since at such time the drum P is free to turn upon the shaft 55. In order to permit and effect the automatic retraction of the paper-carriage from the left to the right hand side of the machine, I provide the mechanism next to be described, whereby the automatic disengagement of the sections 60 and 61 of the clutch mechanism will be effected, the paper-carriage will be withdrawn to the left-hand side of the machine, and the automatic reengagement of the sections 60 and 61 of the clutch will be effected in order to again advance the carriage from right to left of the machine. To the transverse bar 58, at the left-hand side of the main frame of the machine, is pivotally connected, as at 70, the lower end of the clutch-bar 71, that extends through the reduced annular portion of the collar 62 (see Figs. 5, 6, and 7) and extends upwardly to a point slightly above the cross-bar 41 at the left of the machine and through the perforated end 72 of the shifting-rod 73, that extends from side to side of the machine. To this shifting-rod 73, adjacent its left-hand end, is pivotally connected, as at 74, one end of the elbow-lever 75, that is pivotally mounted, as at 76, upon the transverse bar 41, and the other end of this elbow-lever 75 is provided with a vertical arm 77, that extends into position to be struck by the end of the paper-carrying roll when this carriage has reached the extreme of its movement toward the left. The right-hand end of the shifting-rod 73 is pivotally connected to an elbow-lever 80, that is pivotally mounted, as at 81, upon the transverse bar 41, this lever 80 being furnished with a vertical arm 82, that extends into position to be struck by the right-hand end plate M of the paper-carriage, after this carriage has been retracted in order to effect the reengagement of the sections 60 and 61 of the clutch mechanism, as will presently more fully appear. To the bed-plate *m'* of the carriage is fastened a suitable standard 90, to which will be connected one end of a coiled spring 91, the opposite end of this spring being connected to a standard 92, that rises from the transverse bar 41 at the right-hand side of the machine.

From the construction as last above defined it will be seen that when the paper-carriage has reached the extreme of its travel toward the left of the machine one of its end plates M will strike the upwardly-extending arm 77 of the elbow-lever 75, causing this lever to rock about its pivot-point 76, thereby forcing the shifting-rod 73 to move toward the

right-hand side of the machine and at the same time to swing toward the front of the machine. As the end of the shifting-rod 73 is thus swung toward the front of the machine it will carry with it the upper end of the clutch-bar 71. (see Figs. 2, 4, and 7,) and will cause this clutch-bar to withdraw the section 61 of the clutch from engagement with the section 60 of the clutch, thereby permitting the drum P to freely revolve upon the shaft 55, and freeing it from the force of the coiled spring 64. When the drum P is thus released from the effect of the coiled spring by the disengagement of the sections 60 and 61 of the clutch, the retracting-spring 91 will withdraw the paper-carriage from the left to the right hand side of the machine. The coiled spring 64 must be rewound from time to time, but in order to prevent the unwinding of this spring when the sections 60 and 61 of the clutch are separated I have provided the face of the section 61 of the clutch with a series of pinholes (see lines, Fig. 7<sup>a</sup>) to receive the check-pin 95 that is carried by the spring-arm 96 attached to the under side of the clutch-bar 71, as shown by dotted lines in Fig. 7. Hence it will be seen that as soon as the section 61 of the clutch is withdrawn from engagement with the section 60, the pin 95 will enter one of the pinholes in the face of the section 61, and thus dog the section against movement so long as the sections 60 and 61 of the clutch are disengaged. When, however, the clutch-bar 71 is moved to effect the reengagement of the sections 60 and 61 of the clutch, as will presently appear, the long pin 97 that projects laterally from the spring-arm 96 will contact with the side of the drum P and force the pin 95 out of engagement with the pinholes of the sections 61 of the clutch. The reengagement of the sections 60 and 61 of the clutch mechanism, in order to bring the spring 64 into action to again advance the paper-carriage, is automatically effected when the paper-carriage has been withdrawn to the right-hand side of the machine by the striking of the end plate M of the paper-carriage against the vertical arm 82 of the elbow-lever 80, thereby causing this elbow-lever to rock about its pivot-point 81 and force the shifting-rod 73 to move toward the left and at the same time cause the left-hand end of this rod to move in backward direction, carrying with it the clutch-bar 71. From what has been seen it is obvious that the backward movement of the clutch-bar will cause the reengagement of the sections 60 and 61 of the clutch and will connect the drum P with the coiled spring 64 to again effect the advancement of the paper-carriage.

In order to move the paper strip a sufficient distance to give the desired space between the succeeding lines of writing, I have provided the right-hand end of the paper-carrying roll E with a ratchet-wheel R, the teeth *r* of which will engage with the upper face of the inclined bar R', that is pivotally fas-



tened to a bracket  $r'$ , rising from the transverse bar 41. The bar  $R'$  is shifted to vary the space between lines by a pivoted block  $r^2$ , mounted within a slotted standard  $r^3$  and furnished with a handle  $r^4$ , so that when the handle is in position shown in Fig. 4 the bar  $R'$  will effect a single space, and when the handle is in the position shown in Fig. 4<sup>a</sup> a double space will be effected. The backward movement of the paper-carrying roll E is guarded against by means of a suitable pawl S, that is held by the spring  $s$  in engagement with the teeth  $r$  of the ratchet-wheel  $R'$ . Hence it will be seen that each time the paper-carriage is completely withdrawn to the right-hand side of the machine in order to write a new line the paper-carrying roll E will have a partial revolution imparted thereto sufficient to advance the paper strip 45 the distance between the lines. The paper strip 45 will thus be unwound from the roll I, so that a sheet or strip of any desired length can be printed, and when the printing of the sheet is completed it may be severed from the main body of the strip by means of a tearing-knife V, preferably of flexible metal to permit it to be pressed against the paper, this strip V having its ends  $v$  attached to the upright arms  $V'$ , that project from the end plates M of the paper-carriage.

An inking-ribbon T, passing between the ends  $t$  of a guard  $T'$ , may be employed, this ribbon being carried upon suitable rolls 99, journaled upon the studs 100, bolted to the arms  $D'$ , attached to the ends 9 of the shifting-frame 7. Any convenient automatic feed mechanism may be used for advancing the ribbon; but as such mechanism forms no part of my present invention I have not deemed it necessary to illustrate the same in the drawings.

In order to permit the paper strip 45 to be printed with suitable permanent reading-matter—such, for example, as letter-headings, invoice-headings, or the like—I provide the printing mechanism next to be described.

To the cross-bar  $A^1$  of the main frame is bolted a transverse bar or table W, from the ends of which depend the hanger-arms  $w$  and from the ends of which rise also the guide-arms  $w'$ . In these hanger-arms  $w$  is journaled a rock-shaft X, having fixed thereto the arms 105, that are pivotally connected to the links 106, which in turn are pivotally connected, as at 107, to the die-plate 108, the ends of this plate being cut away to straddle the guide-arms  $w'$  to insure its accurate vertical movement. To the outer end of the rock-shaft X is keyed an operating-handle 110, and by the turning of this handle and consequent rocking of the shaft X the die-plate 108 will be raised and lowered. From one of the back standards  $a$  of the main frame projects a lug 112, to which is pivotally connected, as at 113, the inking-pad 114, this pad resting normally upon the face of the die that is carried by the die-plate 108 and serving to apply the ink to

the face of its type. From this construction it will be seen that when the operating-handle 110 is moved downward it will cause the upward movement of the die-plate 108, thereby throwing the inking-pad 114 backward and forcing the die or type upon the plate 108 to print against that part of the paper strip beneath the platen-bed  $m^2$  that is attached to the under side of the transverse plate  $m'$ , and by this means the desired letter-headings or like matter may be impressed upon the strip of paper 45. In order to enable the paper-carrying roll E to be rotated to advance the paper strip 45 after the strip has been thus printed with the desired letter-heading or the like, I provide the rock-shaft X with a sprocket-wheel 120, over which passes a chain 121, that passes around a sprocket-wheel 122, that is keyed to the shaft  $e$ , whereon the paper-carrying roll E is sustained. The sprocket-wheel 120 is loosely mounted upon the rock-shaft X, but is provided with a ratchet-wheel 125, that is engaged by a feed-pawl 126, pivotally affixed to the lower portion of the operating-handle 110, this pawl 126 being held in normal engagement with the ratchet-wheel 125 by means of a spring 127. By reference more particularly to Fig. 1 of the drawings, it will be seen that when the operating-handle 110 is depressed the die-plate 108 will be lifted to make its impression upon the paper strip 45; but during this movement of the operating-handle the pawl 126 will ride freely over the teeth of the ratchet-wheel 125. When, however, the operating-handle 110 is moved upward on its return stroke, the end of the pawl 126 will engage with the teeth of the ratchet-wheel 125, thereby causing a partial rotation of this ratchet-wheel, and through the medium of the sprocket-wheel 120, chain 121, sprocket-wheel 122, and shaft  $e$  will effect a corresponding rotation of the paper-carrying roll E. It is plain also that this operating-handle will serve as a convenient means for effecting the rotation of the paper-carrying roll E to advance the paper strip, even when it is not desired to produce an impression from the die upon the plate 108, since it is only necessary to restrict the downward movement of the operating-handle 110, so that the die will not make an impression upon the paper.

The details of construction above set out may be varied in many instances without departing from the spirit of my invention, and features of the invention may be employed without its adoption as an entirety. Thus, for example, a weight may be substituted for the spring as a means for effecting the movement of the paper-carriage.

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

1. In a type-writer the combination with a series of type-bars provided with two or more type, of a vertically-shifting frame for sustaining said type-bars and upon which said type-bars are concentrically pivoted, and a



series of key-levers connected with said type-bars, certain of said key-levers being arranged to shift said frame, and a series of keys for operating said key-levers.

5 2. In a type-writer, the combination with a series of individual pivoted type-bars, provided with two or more type, of a frame for sustaining said type-bars, a series of operating-keys, and suitable connecting mechanism,  
10 between said keys and said individual type-bars and said shifting-frame, whereby the operation of the keys will cause the shifting of the frame and the movement of the corresponding individual type-bars to effect the  
15 impression of the type, substantially as described.

3. In a type-writer, the combination with a series of type-bars provided with two or more type, of a shifting-frame whereby said type-  
20 bars are sustained, said type-bars being arranged to project normally from the front of the machine, and being provided with rearwardly-projecting ends, a series of key-levers connected with the rearwardly-projecting  
25 ends of the type-bars, a series of keys for operating said key-levers, and suitable means whereby said keys may operate the shifting-frame that sustains the type-bars, substantially as described.

30 4. In a type-writer, the combination with a series of type-bars, provided with two or more type, a shifting-frame for sustaining said type-bars, a series of key-levers connected with said type-bars, a series of keys connected  
35 with said key-levers and adapted to operate the same independently of the shifting-frame, and a further series of keys connected with said key-levers and mechanism whereby said last-named series of keys can effect the move-  
40 ment of the shifting-frame that carries the type-bars, substantially as described.

5. In a type-writer the combination with a series of individual swinging type-bars provided with two or more type, a shifting-frame  
45 whereon said individual type-bars are concentrically pivoted, a series of key-levers connected with said type-bars, a suitable transverse shifting-bar connected with said shifting-frame, and keys for conjointly operating  
50 said keys and said shifting-bars, to effect the swinging movement of the type-bars necessary to cause the impression of said type and to secure the movement of the shifting-frame, substantially as described.

55 6. In a type-writer, the combination with a series of type-bars, provided with two or more type, of a vertically-shifting frame whereon said type-bars are concentrically pivoted, a series of keys, and connecting mechanism for  
60 operating said shifting-frame and said type-bars, and a spring for restoring said shifting-frame to its normal position, substantially as described.

7. In a type-writer, the combination with a  
65 series of type-bars provided with three type, of a shifting-frame for sustaining said type-

bars, a series of key-levers for operating said type-bars, a series of keys adapted to operate said key-levers independently of the shifting-frame, a shifting-bar connected with said  
70 shifting-frame to impart a partial movement to said frame, a second series of keys adapted to operate the key-levers and said shifting-bar, another shifting-bar connected with said shifting-frame to impart thereto its complete  
75 movement, and a third series of keys adapted to operate the key-levers and the shifting-bar whereby the complete movement of the shifting-frame is effected, substantially as described. 80

8. In a type-writer, the combination with the paper-carriage, a spring or equivalent device for moving said paper-carriage to produce the proper space between letters and words, and an escapement for controlling the  
85 action of said spring, of automatic shifting mechanism for throwing said spring out of action, and a spring or equivalent device for retracting the paper-carriage to begin a new line of writing, substantially as described. 90

9. In a type-writer, the combination with a paper-carriage, a spring or equivalent device for moving said paper-carriage to produce the proper space between letters and words, and an escapement for controlling the  
95 action of said spring, of a clutch for holding said spring in normal engagement with the paper-carriage and an automatic shifting device adapted to be struck by the paper-carriage to effect the release of the clutch to dis-  
100 engage the paper-carriage, from the spring, substantially as described.

10. In a type-writer, the combination with the paper-carriage, and a spring or equivalent device for moving said paper-carriage to produce the proper space between letters and words and an escapement for controlling the  
105 action of said spring, of a clutch for holding said paper-carriage in normal engagement with said spring, a releasing device adapted to be operated by the paper-carriage to effect the disengagement of the clutch and a suitable restoring device adapted to be operated  
110 by the paper-carriage to effect the movement of the clutch to throw the paper-carriage in engagement with the spring, substantially as described. 115

11. In a type-writer, the combination with the paper-carriage, and a spring or equivalent device for moving said paper-carriage to produce the proper space between letters and words and an escapement for controlling the  
120 action of said spring, of a clutch mechanism for holding said paper-carriage in normal engagement with said spring, a releasing mechanism adapted to be struck by the paper-carriage for automatically throwing the paper-carriage out of engagement with the spring, a suitable spring for retracting the paper-carriage to begin a new line, of writing, and a  
125 restoring mechanism adapted to be operated by the paper-carriage to effect the reengage- 130



ment of the paper-carriage with the spring that serves to advance the carriage, substantially as described.

12. In a type-writer, the combination with the paper-carriage, and a spring or equivalent device for moving said paper-carriage to produce the proper space between letters and words and an escapement for controlling the action of said spring, of a clutch mechanism for holding said paper-carriage in normal engagement with said spring, a releasing device adapted to be operated by the paper-carriage to effect the movement of the clutch for disengaging the paper-carriage from the spring, a restoring mechanism at the opposite side of the machine, adapted to be operated by the paper-carriage, and a suitable bar connecting said releasing and restoring mechanism, substantially as described.

13. In a type-writer, the combination with the paper-carriage, and a spring or equivalent device for moving said paper-carriage to produce the proper space between letters and words, of a clutch mechanism comprising sections 60 and 61, the collar 62, the coiled spring 65 suitably connected with said collar, the drum P, the cord O connected with said drum and with the paper-carriage, the clutch-bar 71, and the vertical arm 77, suitably connected with said clutch-bar, and projecting into position to be operated by the paper-carriage, substantially as described.

14. In a type-writer, the combination with the paper-carriage, and a spring or equivalent device for moving said paper-carriage to produce the proper space between letters and words, of a clutch mechanism for holding the paper-carriage in normal engagement with said spring, said clutch mechanism comprising the sections 60 and 61, the clutch-bar 71, the collar 62 suitably connected with the coiled spring, and an arm 96 provided with pin 95, to check the movement of the section 61 of the clutch, and the long pin 97 for throwing said pin 95 out of engagement with the section 61 of the clutch substantially as described.

15. In a type-writer, the combination with the paper-carriage, and a spring or equivalent device for moving said paper-carriage to produce the proper space between letters and words of a clutch mechanism for holding said paper-carriage in normal engagement with

said spring, suitable releasing mechanism for operating said clutch mechanism to effect the disengagement of the paper-carriage from the spring, and a shaft and crank-handle for rewinding the spring, substantially as described.

16. In a type-writer, the combination with the paper-carriage, and a spring or equivalent device for moving said paper-carriage to produce the proper space between letters and words, of a clutch mechanism for holding the paper-carriage in normal engagement with said spring, said clutch mechanism having a clutch-bar 71, the elbow-lever 75, the bar 73 connected with said elbow-lever, and with said clutch-bar, and extending from side to side of the machine, a restoring-lever 80 connected with said bar 73, and adapted to be operated by the paper-carriage, when retracted, substantially as described.

17. In a type-writer the combination with a movable paper-carriage provided with a paper-carrying roll forming a printing-bed for the type-bars, of a transverse plate separate from said paper-carrying roll, but attached to and movable with said paper-carriage, to form a printing-bed for the paper, and a movable die-carrier arranged to print the paper against said bed, substantially as described.

18. In a type-writer comprising a paper-carrying roll, a series of type for printing the paper upon said roll, of a suitable roll for holding the strip of paper to be printed, a platen-bed intermediate the paper-carrying roll, and the roll for the paper strip, and a movable die-plate sustained beneath said platen-bed whereby the strip of paper may be printed by the die before it passes onto the paper-carrying roll, substantially as described.

19. In a type-writer, the combination with a paper-carriage, provided with a paper-carrying roll, of a platen-bed at the rear of said paper-carrying roll, and sustained by said paper-carriage, a die-plate sustained beneath said platen-bed, a movable ink-pad for inking the die of said die-plate, an operating-handle and connecting mechanism for imparting movement to said die-plate, substantially as described.

ARTHUR W. STREET.

Witnesses:

GEO. P. FISHER, Jr.,

I. B. CARPENTER.