

No. 693,033.

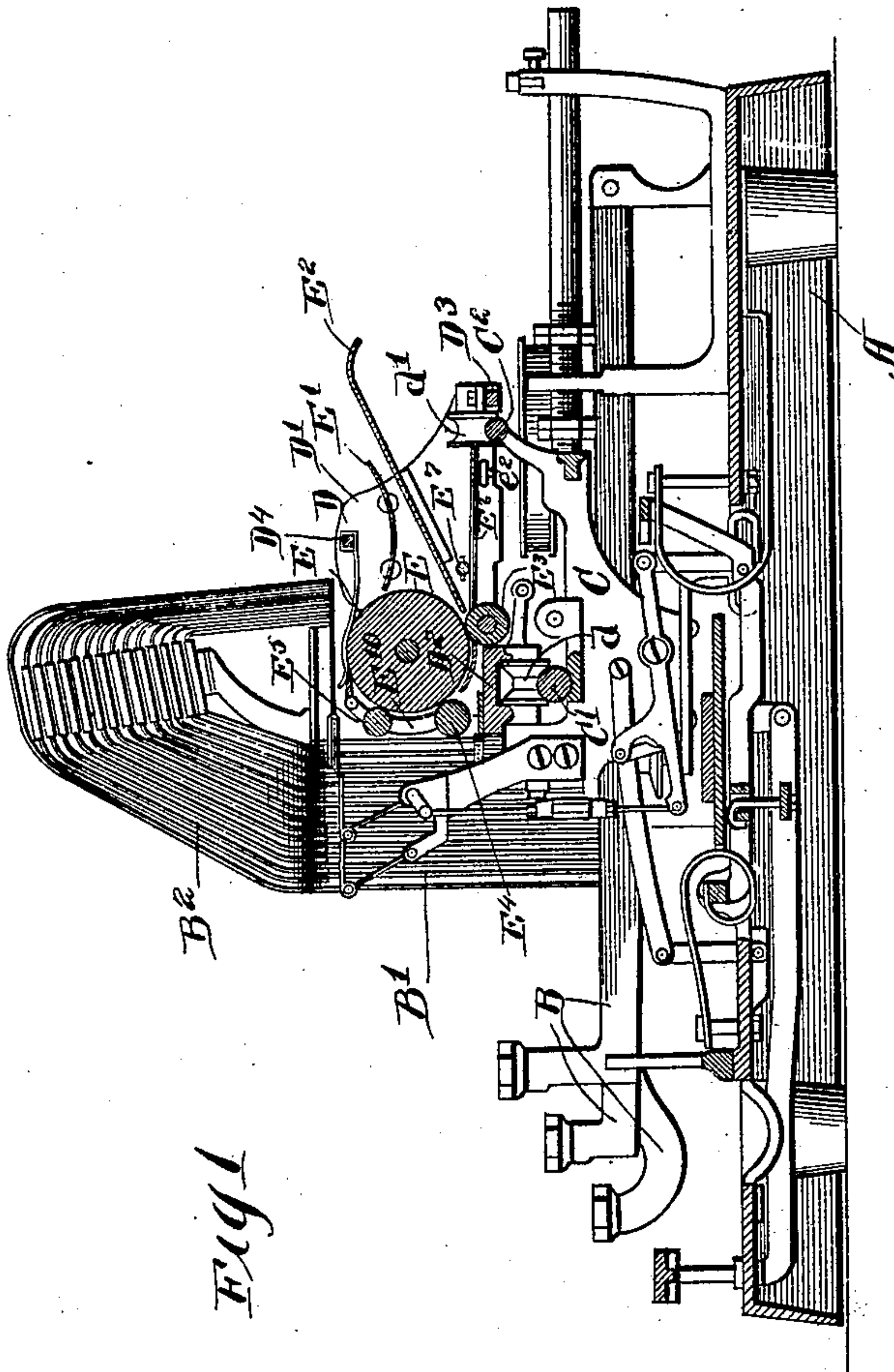
Patented Feb. 11, 1902.

T. L. KNAPP.  
TYPE WRITING MACHINE.

(Application filed July 24, 1901.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses:  
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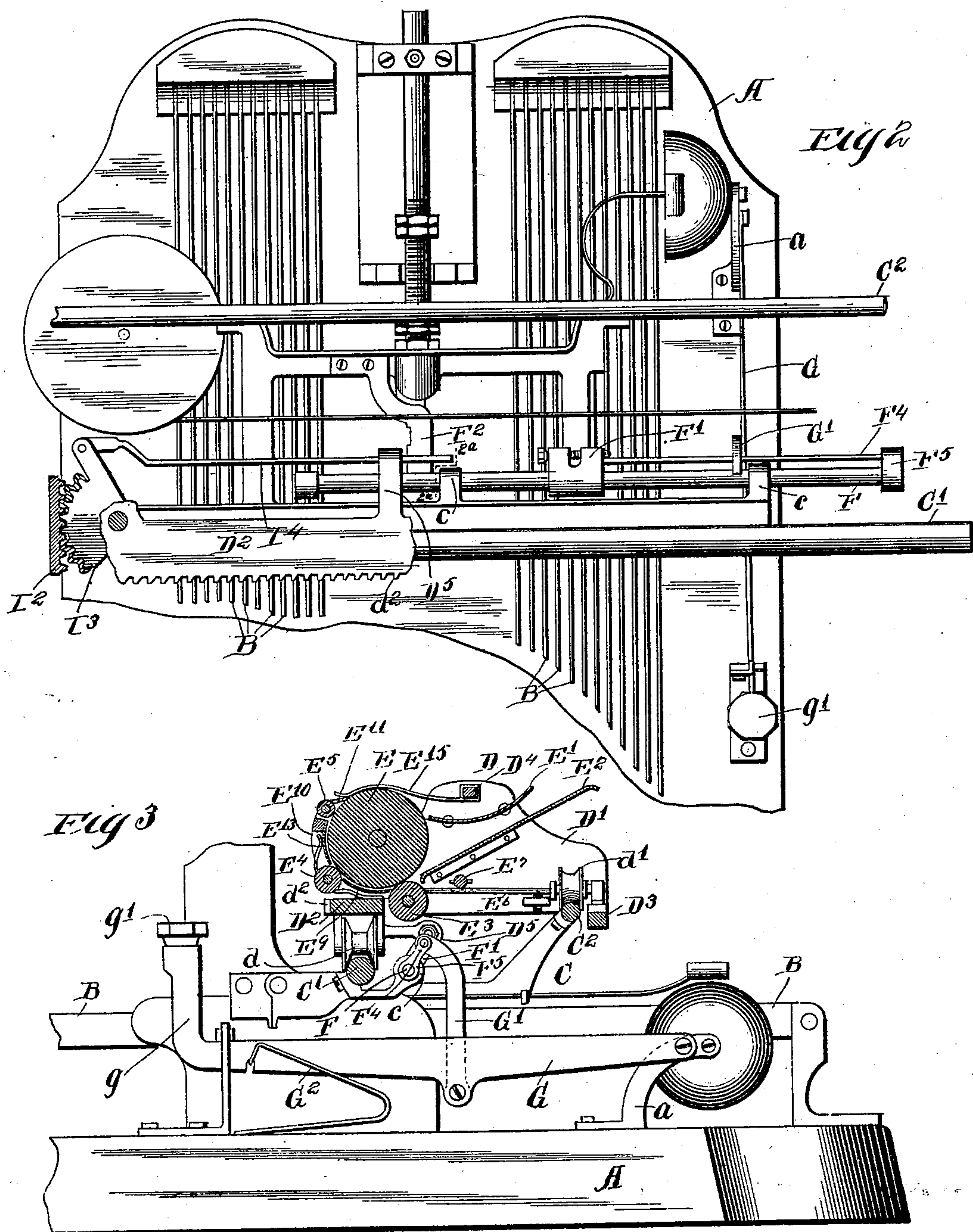
by Poole & Brown  
His Attorneys

**T. L. KNAPP.**  
**TYPE WRITING MACHINE.**

(Application filed July 24, 1901.)

(No Model.)

**4 Sheets—Sheet 2.**



*Witnesses:*

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Fig 2b

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4 Sheets—Sheet 3.

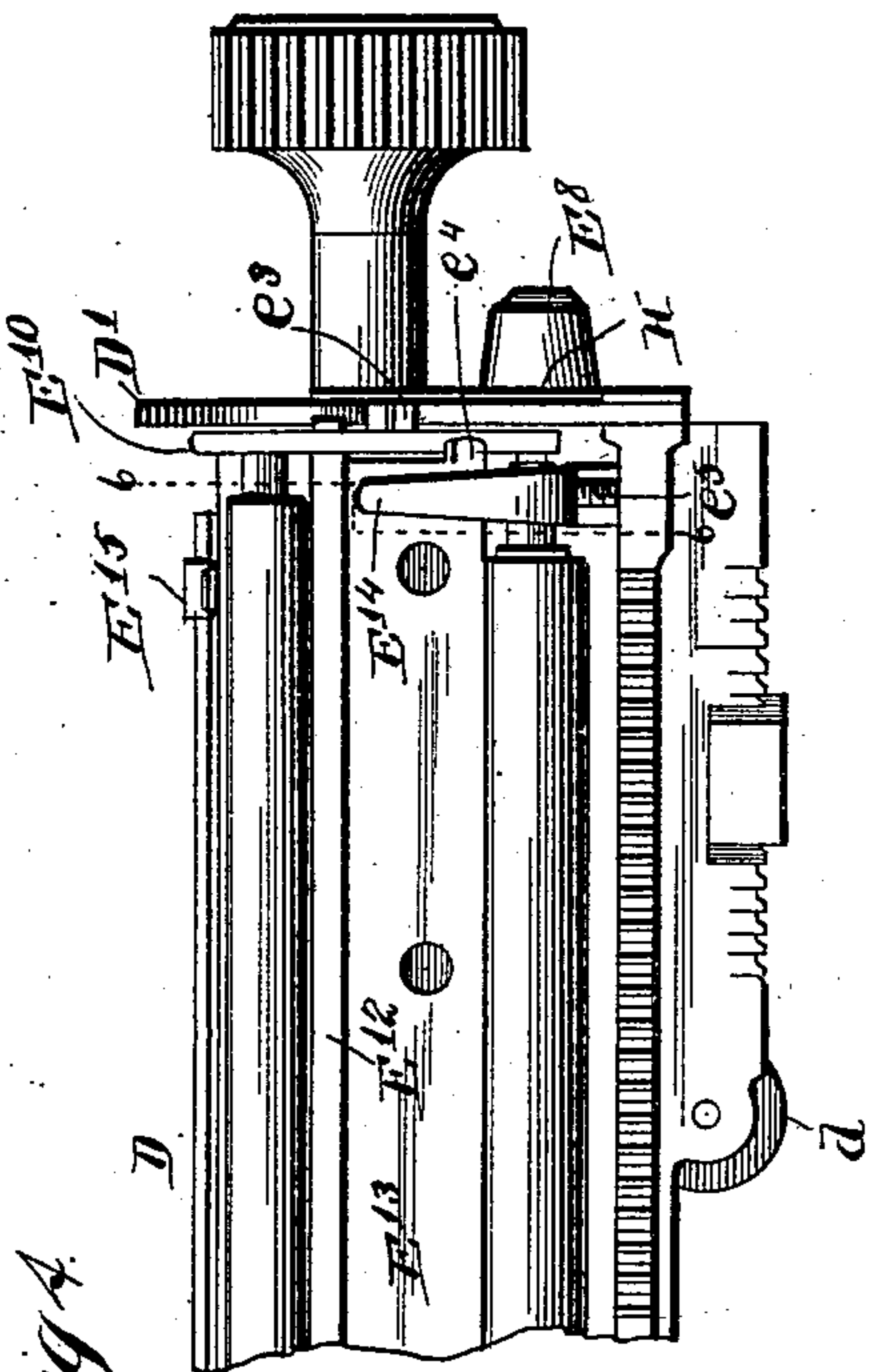


Fig. 4.

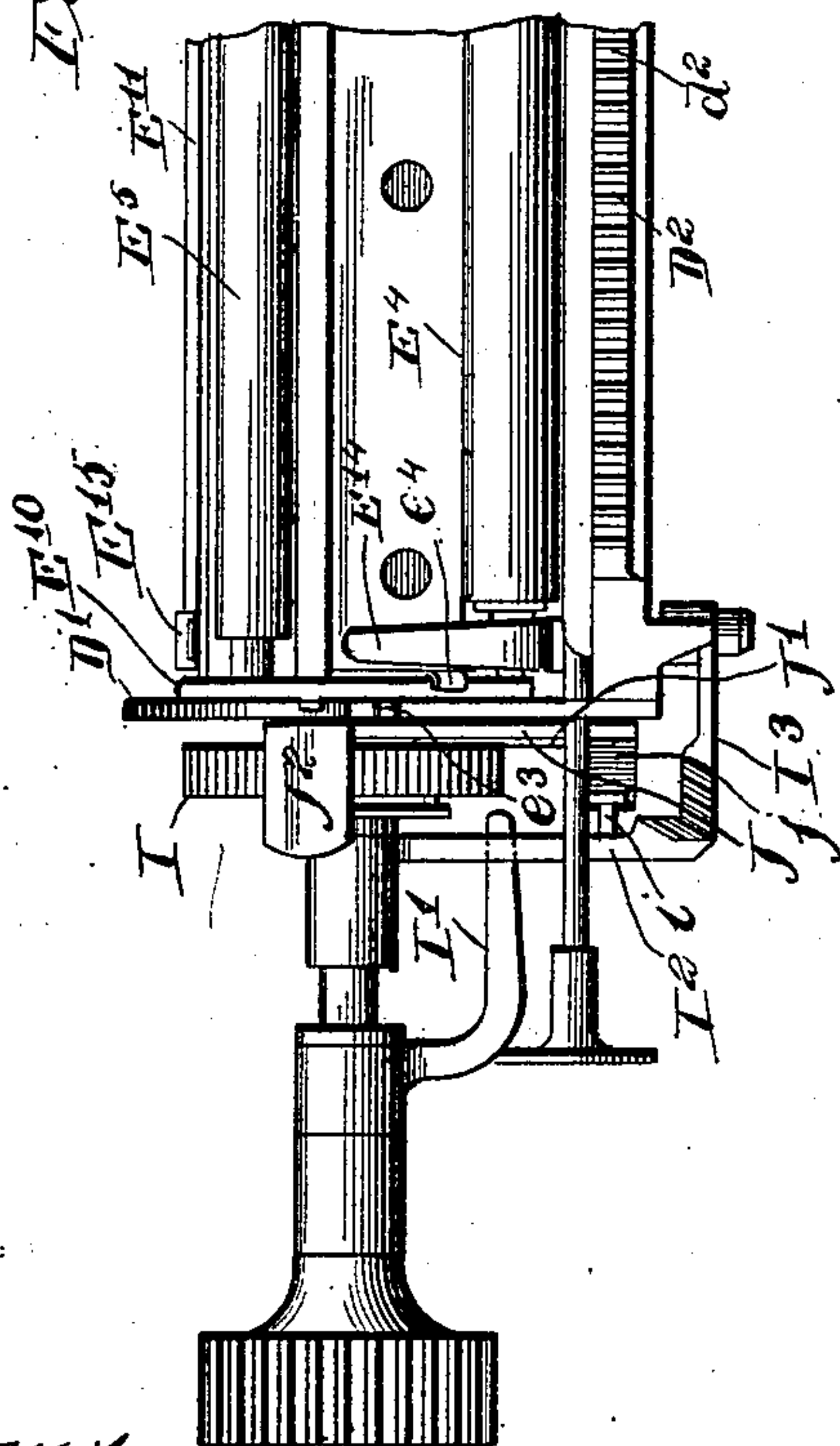


Fig. 5.

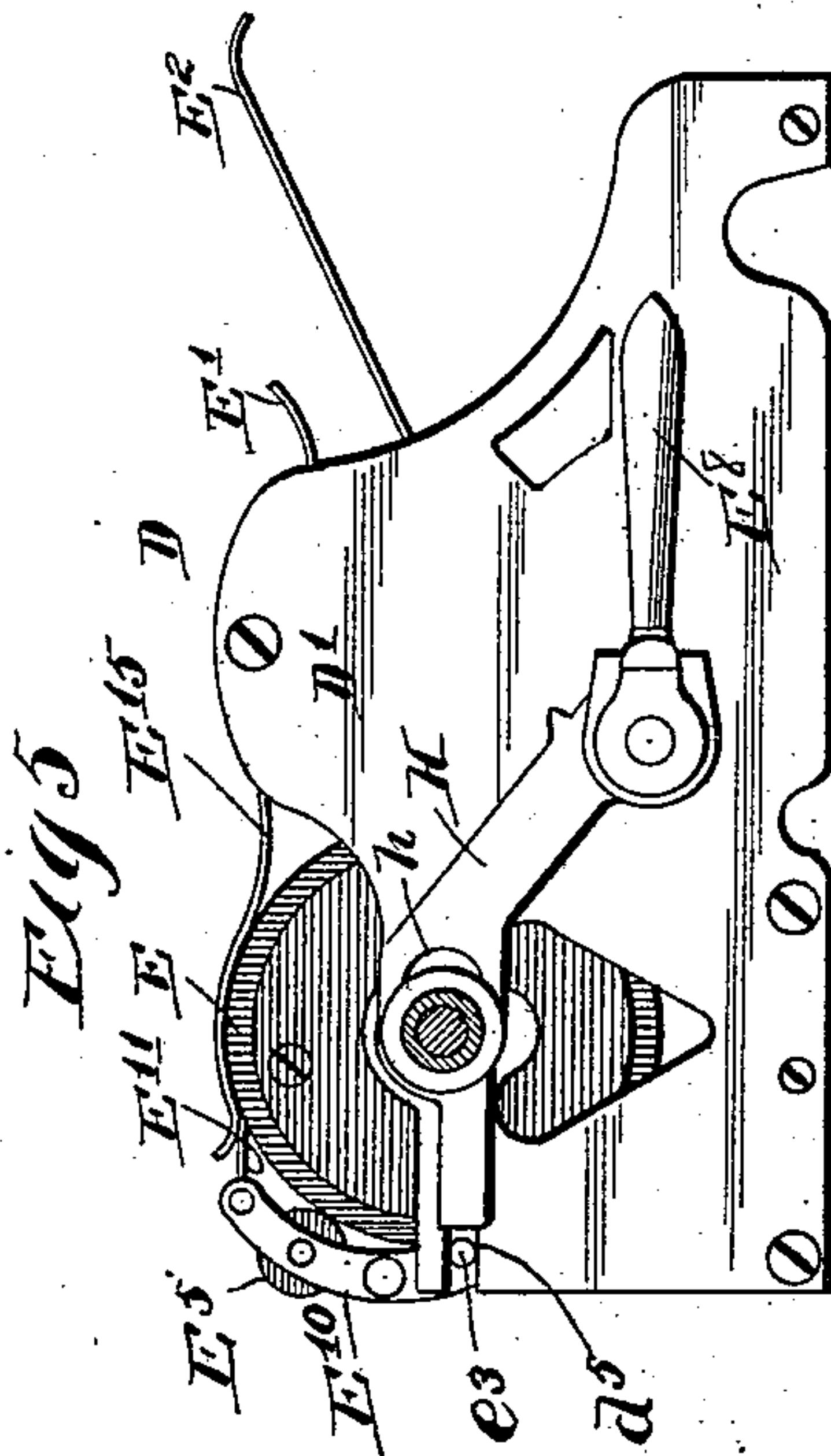
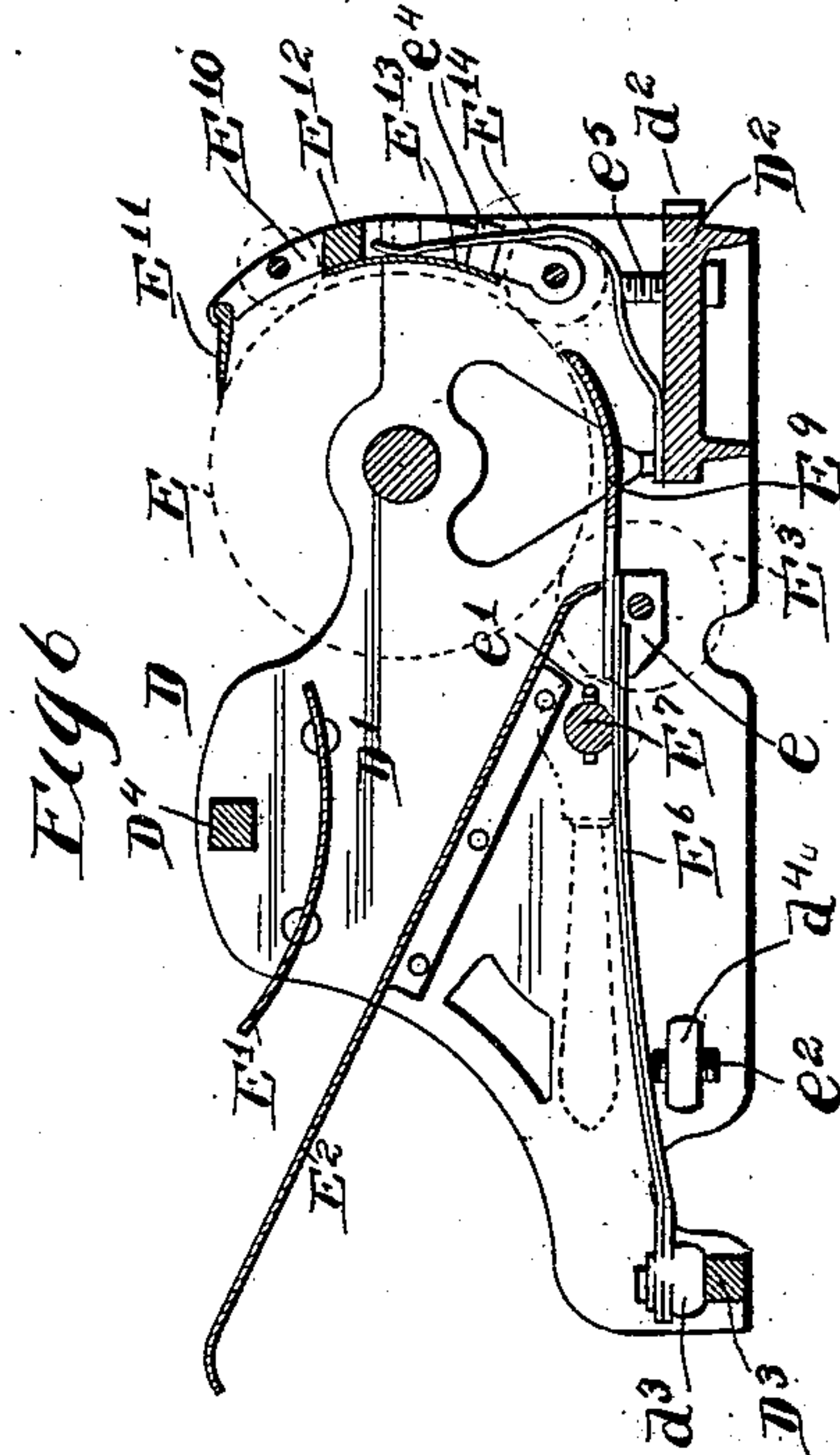


Fig. 6.



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# UNITED STATES PATENT OFFICE.

THERON L. KNAPP, OF WOODSTOCK, ILLINOIS, ASSIGNOR TO THE OLIVER TYPEWRITER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 693,033, dated February 11, 1902.

Application filed July 24, 1901. Serial No. 69,473. (No model.)

*To all whom it may concern:*

Be it known that I, THERON L. KNAPP, of Woodstock, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Type-Writing Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in type-writing machines, and embraces, first, an improved left-hand-margin stop mechanism for determining the width of margin at the left-hand side of the type-written page; secondly, improvements in the presser-rollers for the carriage by which the paper is held in contact with or pressed against the platen while passing around the same, and, thirdly, an improved device for effecting automatic line-spacing at the end of the travel of the carriage.

The several improvements are shown as applied to the Oliver type-writing machine; but it will be obvious from the foregoing that some of the improvements or modifications thereof may be applied to other types of machines.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

Figure 1 is a vertical longitudinal section of an Oliver type-writing machine, showing the principal parts of the operative mechanism thereof. Fig. 2 is a plan view of parts of the machine located directly under the carriage and showing a fragment of the carriage thereon, said parts illustrating the application of my improved left-hand-margin stop mechanism to the machine. Fig. 2<sup>a</sup> is a detail section taken on the line 2<sup>a</sup> 2<sup>a</sup> of Fig. 2. Fig. 2<sup>b</sup> is a view from beneath the rod shown in Fig. 2<sup>a</sup>. Fig. 3 is a transverse vertical section taken near one end of the machine and illustrating the parts of my improved stop mechanism and also certain features of the improvement in the carriage. Fig. 4 is a front elevation of the carriage, partly broken away. Fig. 5 is an end view of the carriage, showing the platen-shaft in section. Fig. 6

is a transverse section on line 6 6 of Fig. 4. Fig. 7 is a top plan view of the carriage-frame with the platen and some of the presser-rollers removed. Fig. 8 is a detail section on line 8 8 of Fig. 7. Fig. 9 is an inside view of the lever shown at the left-hand side in Fig. 7. Fig. 10 is a longitudinal section on line 10 10 of Fig. 9. Fig. 11 is a transverse section on line 11 11 of Fig. 7. Fig. 12 is a fragmentary section on line 12 12 of Fig. 11. Fig. 13 is a fragmentary section on line 13 13 of Fig. 11. Fig. 14 is an end elevation of the left-hand end of the carriage, showing the mechanism for producing variable line-spacing, certain of the parts nearest thereto being removed and others broken away to more clearly show the parts required.

As before stated, my improvements are shown as applied to an Oliver type-writing machine, and only such parts of said machine are shown and referred to as are necessary to an explanation of the construction and application of the several improvements constituting my invention.

I will first refer briefly to the general construction of such parts of the machine herein illustrated as is necessary to an understanding of the application of my improvements to the machine and thereafter describe the several improvements constituting the present invention.

A designates the base-plate of the machine, and B key-levers which extend from front to rear of the machine and which are pivoted at their rear ends upon standards rising from the machine-base. Said levers are connected by links B' with type-bars B<sup>2</sup> of the form employed in said Oliver type-writing machine.

C designates, as a whole, a shifting frame, which moves backwardly and forwardly from a central position, whereby the platen may be brought under the striking-point of three sets of types on the type-bars. Said shifting frame embraces front and rear horizontal guide-bars C' C<sup>2</sup>, on which the carriage rests and travels transversely of the machine.

D designates, as a whole, the carriage, which is supported, by means of rollers *d d'*, on the guide-rails C' C<sup>2</sup>. The carriage-frame consists of two end plates D' D', Fig. 6, a front longitudinal frame-piece D<sup>2</sup>, on which



is formed the rack-bar  $d^2$  of the carriage, a rear longitudinal bar  $D^3$ , and a second longitudinal bar  $D^4$ , extending between the end plates near the upper margins thereof, as indicated in Figs. 1 and 2.

$E$  designates a platen, the shaft of which is rotatively mounted in the end plates  $D'$ .

$E'$   $E^2$  designate upper and lower sheet-metal paper-guides, which are attached at their ends to the end plates of the carriage-frame.

$E^3$  designates a presser-roller located below the center of the platen and adapted to press the paper against the platen.

$E^4$   $E^5$  designate two other presser-rollers located at the front of the platen, one below the center thereof and one above said center, and which are normally pressed against the platen to hold a sheet of paper in frictional contact therewith as it passes upwardly at the front surface of the same toward the striking-point of the type.

The parts of the machine thus briefly described and other parts to be hereinafter referred to are generally like the corresponding parts shown in the prior United States Letters Patent to Oliver, No. 599,863, granted March 1, 1898.

Referring now to the construction of the left-hand-margin stop mechanism, the same is made as follows:

$F$  is a horizontally-arranged rod, which is mounted in lugs  $c$  on the shifting or carriage-supporting frame at the right-hand side of the machine and at the rear of the carriage-supporting guide-bar  $C'$  and parallel with said guide-bar. Said rod is adapted to be moved endwise with respect to the shifting frame and also to rock or rotate in the lugs  $c$ .

The rod  $F$  carries a rearwardly-projecting stop-arm  $F'$ , which is adapted for contact with a stop arm or lug  $D^5$  on the bottom of the carriage-frame, said lug being herein shown as cast integral with the lower frame-bar  $D^2$  of the carriage and extending rearwardly therefrom. The rod  $F$  is adjustably held in place by a spring-actuated pawl  $F^2$ , which projects forwardly from the shifting frame and which engages a series of teeth or notches  $f$  at one side of the rod  $F$ , as shown in Figs. 2<sup>a</sup> and 2<sup>b</sup>. Said pawl bears upwardly against the notched side of the rod when the stop-arm  $F'$  is in operative position—that is to say, when it is in the path of the lug  $D^5$ —and said pawl at this time prevents endwise movement of the rod. When the rod is partially rotated, the pawl is brought into contact with the smooth part of the rod, thereby permitting said rod to be moved endwise to adjust the stop-arm  $F'$  with respect to the travel of the carriage in a manner to vary the width of the margin.

The construction of the left-hand-margin stop thus far described is substantially like the stop shown in the said prior patent to Oliver, No. 599,863. My improvements in this feature of the invention embrace fea-

tures as follows: Said rod is adapted to be rotated in the bearing-lugs  $c$  through the medium of a lever  $G$ , which is pivoted at its rear end upon a standard  $a$ , rising from the base-plate  $A$ , and which lever is connected between its ends with the rod  $F$  in a manner to rock or partially rotate the same. The connection herein shown between said lever and the rod consists of a link  $G'$ , which is pivoted at its lower end to the lever  $G$  and is pivotally connected at its upper end with a rod  $F^4$ , which latter rod is arranged parallel with the rod  $F$  and rigidly connected therewith, being attached at one end to the stop-arm  $F'$  and at its other end to an arm  $F^5$ , parallel with the stop-arm  $F'$  and extending rearwardly from the outer end of the rod  $F$ . The link  $G'$  is provided at its upper end with an aperture, through which said rod  $F^4$  passes, and said rod fits loosely within said aperture, so as to enable the same to slip endwise there-through when the rod  $F$  is moved endwise to adjust the position of the stop-lug  $F'$ . The lever  $G$  extends forwardly from the link  $G'$  and is provided at its forward end with an upright arm  $g$ , surmounted by a key  $g'$ , by which the lever is adapted to be depressed. The lever  $G$  is pressed upwardly by a lifting-spring  $G^2$ , located between the lever and the base  $A$  of the machine, and said spring when the lever is released acts to return the lever to its uppermost position, and thereby rocks the rod  $F$  to its normal position and swings the stop-arm  $F'$  thereof upwardly into the path of the stop-lug  $D^5$  of the carriage. When a given width of margin is desired, said rod is adjusted to bring the stop-arm  $F'$  thereof in position to stop the carriage at the proper point in its travel to produce this width of margin. So long as no writing is to be done upon the margin the stop-arm  $F'$  will not be disturbed. If, however, it is desired to print a letter or word upon the determined margin, the stop-arm  $F'$  is swung downwardly out of the way of the stop-lug  $D^5$  of the carriage by depressing the lever  $G$  in the manner described, after which the carriage may pass beyond the limit of movement before determined by the stop-lug and stop-arm.

I will next describe the improvements in the carriage, which relate more particularly to the manner of mounting the presser-rollers  $E^3$   $E^4$   $E^5$  therein, whereby the same may be moved toward and from the platen. The manner of mounting the presser-roller  $E^3$  in the carriage-frame is substantially like that shown in the prior patent to Oliver, before mentioned. The shaft of said roller is mounted at its ends in blocks  $e$ , (indicated in dotted lines in Fig. 7 and shown in full lines in Fig. 6,) which blocks are attached to the forward and free extremities of horizontal spring-arms  $E^6$   $E^6$ , arranged one at each end of the carriage-frame, as shown in Fig. 7. Said spring-arms are attached at their rear ends to inwardly-projecting lugs  $d^3$  on the end plates of the carriage-frame and project forwardly



toward the platen parallel with said end plates. The action of said spring-arms is to press the roller toward the platen and to hold the paper which is between the roller and the platen in contact with the latter. The roller is released from contact with the platen as may be necessary for adjusting the paper after insertion and in some cases for convenience of inserting the advanced edge of the paper by means of a rock-shaft  $E^7$ , which is mounted in the end plates of the carriage and extends longitudinally thereof above the spring-arms. Said rock-shaft is provided near its ends with the cam arms or projections  $e'$ , which are located over and adapted to act upon the spring-arms in a manner to depress the same when the rock-shaft is turned in a direction to carry the cam projections against said spring-arms. Said rock-shaft is provided at one end with a handle-lever  $E^8$ , by which it may conveniently be rotated when desired. The tension of said spring-arms is varied by means of adjusting-screws  $e^2$ , Fig. 6, which pass upwardly through lugs  $d^4$  on the end plates of the carriage and engage the underfaces of said arms. A guide-plate  $E^9$ , Figs. 3 and 6, is attached to the free ends of said spring-arms, said guide-plate extending forwardly and upwardly from the presser-roller  $E^3$ . The advance edge of said guide-plate is located adjacent to the roller  $E^4$ , and said guide-plate guides the advance edge of the paper so that it will enter between said roller and platen after it leaves the roller  $E^3$ .

The shafts of the rollers  $E^4$   $E^5$  are journaled in the lower and upper parts, respectively, of a floating frame consisting of end pieces or bars  $E^{10}$ , which are preferably curved to correspond to the curvature of the platen, located just inside the end plates of the carriage-frame, and a longitudinal connecting-bar  $E^{12}$ , attached to said pieces between the ends thereof. A scale-strip  $E^{11}$  is pivoted at its ends to the upper ends of the bars  $E^{10}$  and is graduated on its upper surface to form a letter-space scale. The scale-bar is pivoted at its outer ends to the said bars, and its inner edge overhangs the platen and rests thereon. To the bar  $E^{12}$  is attached a depending guide plate or apron  $E^{13}$ , which extends between the rollers  $E^4$  and  $E^5$  and serves to guide the paper after it leaves the presser-roller  $E^4$  and until it comes into contact with the presser-roller  $E^5$ . The floating frame, carrying the presser-rollers  $E^4$   $E^5$ , is movably mounted in the end plates of the carriage-frame by means of lugs  $e^3$ , projecting outwardly from the curved end pieces of said floating frame and engaging forwardly-opening slots  $d^5$  in the front margins of said end plates, as shown in Figs. 5 and 14. The presser-rollers  $E^4$   $E^5$  are held yieldingly against the platen by means of springs  $E^{14}$ , which are attached to the carriage at their lower ends and the upper free ends of which bear inwardly against the floating frame. In the particular

construction illustrated said free ends of the springs  $E^{14}$  bear against the guide-plate  $E^{13}$ , which, being attached to the bar  $E^{12}$ , transmits the pressure of the springs to the floating frame. The said guide-plate is shown as unattached at its ends to the end bars  $E^{10}$ , and when this construction is employed the said guide-plate will, as shown, be provided at its ends adjacent to its lower edge with lips or lugs  $e^4$ , which overlap the end pieces  $E^{10}$  of the floating frame, so that the pressure of the springs will be communicated through the guide-plate to both the lower and upper parts of the end pieces and therethrough to the rollers to hold the latter yieldingly against the platen. The parts of the springs  $E^{14}$  which extend over the rack-bar are generally horizontal, as shown in Fig. 6, and are engaged by set-screws  $e^5$ , passing upwardly through the rack-bar. By raising or lowering the set-screws the pressure of the free ends of the springs may be increased or diminished, so that the presser-rollers may be made to bear against the platen with greater or less pressure, as desired.

Means are provided for moving the floating frame and presser-rollers carried thereby away from the platen at the time the paper is inserted in the machine to facilitate the insertion of the paper and the adjustment thereof on the platen as may be necessary to bring the printed lines parallel with the top edge of the sheets and the margins in proper relation to the ends of the platen. Such devices are, as herein shown, adapted to be actuated through the same parts which are moved to shift the lower roller  $E^3$  away from the platen. The construction illustrated in these parts is as follows:

$H$   $H'$  designate two endwise-movable push-bars, the former located outside the end plate at the right-hand side of the carriage and the latter located just inside the end plate at the left-hand side thereof. Said push-bars are provided with circular openings at their rear ends, which fit over circular eccentric cam-disks  $e^6$   $e^7$ , which rotate with the shaft  $E^7$ . The cam-disk  $e^6$ , Figs. 9 and 10, is located on the base of the lever  $E^8$ , by which the rod  $E^7$  is rotated, and between the same and the adjacent end plate of the carriage, while the disk  $e^7$  is formed on the shaft  $E^7$  adjacent to the other end plate of the carriage, said disk having a flange which extends radially beyond the margin of said cam and the rear end of the push-bar  $H'$  being located between the flange and the adjacent end plate of the carriage, as clearly shown in Fig. 13. The forward end of the push-bar  $H$  engages the bearing-stud  $e^2$ , by which the floating frame is supported in the end plate of the carriage-frame, said stud projecting outwardly beyond the end plate a sufficient distance to engage said push-bar. The forward end of the push-bar  $H'$  is bifurcated and engages the adjacent end piece of the floating frame above and below its supporting-stud  $e^3$ , as shown in Fig.



11. Said push-bars H H' are provided with guide-slots  $h$   $h'$ , respectively, through which the platen-shaft passes, as clearly shown in Figs. 8 and 11, said shaft, with the guide-slots, constituting guides for holding the push-bars in proper lateral position. The cam-disks  $e^6$   $e^7$  are so arranged with respect to the cam projections  $e'$  on the rods  $E^7$  that their parts of greatest eccentricity will be thrown forward toward the end pieces of the floating frame, and thereby move said push-rods toward said end pieces at the time the projections  $e'$  are carried against the spring-arms  $E^6$ . The same rotation of the shaft  $E^7$ , therefore, which throws the spring-arms downwardly and the presser-roller  $E^3$ , connected therewith, away from the platen also projects the push-bars H H' forwardly, and there-through moves the floating frame and presser-rollers carried thereby away from the platen. The cam projections  $e'$  and cam-disks  $e^6$   $e^7$  are thrown past their centers of movement by the lever  $E^8$  when the presser-rollers are to be thrown outwardly from the platen and remain in this position until the shaft  $E^7$  is partially rotated backwardly, and the springs  $E^6$  thereafter serve to return said presser-rollers to their normal positions. The push-bar H is provided with a stop projection  $e^9$ , which is adapted for engagement by a stop  $e^{10}$ , carried by the lever  $E^8$ , at the limit of the throw of said lever in each direction to arrest the movement thereof, as clearly shown in Figs. 8 and 9. The graduated rocking bar  $E'$  at the top of the platen is held yieldingly against the platen by means of spring-guides  $E^{15}$ , said guides pressing at their ends against the bar, as shown in Fig. 5.

Next referring to the devices for effecting variable line-spacing, these parts are shown in Figs. 4 and 14 and are made as follows:

I designates a ratchet-wheel affixed to the platen-shaft, by which the platen is turned for line-spacing and by which it is held from turning when a line is being printed. Said ratchet-wheel is located outside the end plate of the carriage-frame at the left side of the machine. An oscillating arm I' is loosely mounted on the platen-spindle and is curved at the end to engage the teeth of said ratchet-wheel I. The extremity of said arm is held normally outside of the plane of the ratchet-wheel by a suitable spring, (not shown,) but may be moved inwardly toward the wheel to engage the teeth thereof in the same manner as described in the said Oliver patent, above referred to. A gear-segment  $I^2$  is also mounted on the platen-shaft and is provided with an aperture, through which the end of the oscillating arm extends. Another gear-segment  $I^3$  is mounted to swing horizontally in the lower part of the carriage-frame, said segment being herein shown as supported upon a pivot-stud secured to the rack-bar adjacent to the end plate of the carriage. The platen-spindle turns freely in the hubs of the arm I' and gear-segment  $I^2$ , so that the platen may be

turned by its actuating-knob without affecting the action of said arm or gear-segment. When pressure is exerted upon said knob inwardly, the spring by which the knob and arm I' are held outwardly is overcome and said arm I' is pushed into engagement with the ratchet-wheel I. If the gear-segment  $I^2$  be now swung on its axis, it will impart through said arm I' rotary motion to the ratchet-wheel, and thereby turn the platen a distance corresponding with the movement of said gear-segment. Means are provided for automatically turning the platen in the manner above stated as the carriage is returned to its starting-point to begin a new line. Said carriage is adapted to be returned to its starting-point by pressure on the knob of the platen-shaft, which acts to bring the arm I' into engagement with the ratchet-wheel in the manner stated, and thereafter the gear-segment  $I^2$  is automatically oscillated to turn the ratchet-wheel and platen. Said means for automatically turning the platen in the manner described consists of an endwise-reciprocating rod  $I^4$ , Fig. 2, which is pivoted to the gear-segment  $I^3$  and has sliding engagement with the stop-lug  $D^5$  on the carriage and projects a distance beyond said lug, so as to be engaged by the stop-arm  $F'$  on the rod F in advance of the engagement of said stop-arm with the lug  $D^5$ . With this construction when the carriage is moved back to its starting-point by pressure on the knob of the platen-shaft, which pressure causes the oscillatory arm I' to pass between two of the teeth of the ratchet-wheel I, the rod  $I^4$  comes in contact with the stop-arm  $F'$  and causes a partial rotation of the gear-segment  $I^3$ , which acts through the segment  $I^2$  and arm I' to rotate the ratchet-wheel I and the platen.

The improvements constituting a feature of the present invention consist of a stop-plate which is constructed to variably limit the movement of the gear-segment  $I^2$ , and thereby produce a greater or less line-space, according to the extent of movement of said segment. As herein shown, J designates the adjustable stop-plate referred to, which has both pivotal and sliding movement on the platen-shaft and is provided with a stop projection  $j$ , adapted to engage a stop-pin  $i$  on the gear-segment  $I^2$  to limit the movement of said gear-segment. Said stop-plate is held in one of three positions of adjustment by engagement of a pin  $j'$  on the end plate of the carriage-frame with one of three notches  $j^2$  on the lower end margin of the stop-plate. The bearing-aperture  $j^3$  of the stop-plate is slotted, so that said plate may be moved endwise to disengage either of the notches  $j^2$  from the stop-pin  $j'$ , after which it may be swung on its axis to bring one of the other notches  $j^2$  in line with the stop-pin  $j'$  and then moved endwise to effect reengagement of the stop-pin with the plate and lock said plate in a new position. The plate is held yieldingly in engagement with the stop-pin by means of a



spring J', engaged at one end with the platen-spindle and connected at its other end to the stop projection *j*, or otherwise suitably attached to the plate in a manner tending to thrust the stop-plate toward the stop-pin *j'*. Said stop-plate is provided at its upper end with a laterally-extending finger-piece *j*<sup>2</sup>, by which the plate may readily be manipulated to change the adjustment of the plate. As shown in Fig. 14, the stop-plate is in position to limit the movement of the gear-segment I<sup>2</sup> after the platen has been rotated through one line-space. The two other notches provided in the lower margin of the plate enables the plate to be set to permit the platen to rotate through either two or three spaces, as desired.

The ratchet-wheel I and platen are held from turning by means of a holding-pawl K, pivoted on a stud *k*, projecting outwardly from the end plate of the carriage, said pawl being held against the ratchet-wheel by means of a spring K', attached at one end to the end plate of the carriage and engaging at its other end a tailpiece *k'* of the pawl K. A lever L is pivoted to the machine-frame and provided with a cam projection *l*, adapted to engage said tailpiece to throw said holding-pawl out of engagement with the ratchet-wheel I when desired.

I claim as my invention—

1. The combination with an endwise-movable paper-carriage and a frame supporting the same provided with guides for the carriage, of a margin-stop consisting of a rod mounted to rotate and slide endwise in said frame, a stop-arm on the rod for contact with the carriage and means for rotating said rod to swing the stop-arm out of the path of the carriage comprising a second rod arranged parallel with and rigidly attached to said rotative rod, and a key-lever having endwise-sliding connection with said second rod.

2. The combination with an endwise-movable paper-carriage and a frame supporting the same provided with guides for the carriage, of a margin-stop consisting of a rod mounted to slide endwise and rotate in said frame, a stop-arm on the rod adapted for contact with the carriage, and means for rotating said rod to swing the stop-arm out of the path of the carriage comprising a second rod arranged parallel with and rigidly attached to said rotative rod, a key-lever and a link connecting with said lever and said second rod, said link being connected with the second rod in a manner permitting the rod to slide endwise with respect to the link.

3. The combination with an endwise-movable paper-carriage and a frame supporting the same provided with guides for the carriage, of a margin-stop consisting of a rod mounted to slide endwise and rotate in said frame, a stop-arm on the rod adapted for contact with the carriage, and means for rotating said rod to swing the stop-arm out of the path of the carriage comprising parallel arms on said rotative rod, a second rod parallel

with the rotative rod mounted in said arms, an oscillatory lever, and a link pivoted at its lower end to said lever and provided at its upper end with an aperture through which said second rod loosely passes.

4. The combination with an endwise-movable paper-carriage and a frame supporting the same provided with guides for the carriage, of a margin-stop consisting of a rod mounted to rotate and slide endwise in said frame, a stop-arm on the rod for contact with the carriage and means for rotating said rod to swing the stop-arm out of the path of the carriage, comprising a second rod arranged parallel with and rigidly attached to said rotative rod, a key-lever, a link connecting said lever with the second rod having endwise-sliding connection with the latter, and a spring against the action of which said lever is depressed, said spring returning said arm into the path of the carriage when pressure on the lever is released.

5. The combination with an endwise-movable paper-carriage and a frame supporting the same provided with guides for the carriage, of a rod mounted to rotate in said frame, a stop-arm on the rod adapted for contact with a stop-lug on the carriage, a key-lever connected with the rod and adapted to rotate said rod to swing said stop-arm out of the path of said lug, a rotative platen on the carriage, a ratchet-wheel on the platen-shaft, an oscillatory gear-segment mounted concentrically with respect to the platen-shaft, a second oscillatory gear-segment mounted on the carriage and having intermeshing engagement with the first gear-segment, means for connecting said first gear-segment with the ratchet-wheel to rotate the latter when the gear-segment is oscillated, and an endwise-movable rod attached at one end to said second gear-segment and having sliding engagement with said lug and adapted for contact with said stop-arm in advance of the lug.

6. The combination with an endwise-movable paper-carriage and a frame supporting the same provided with guides for the carriage, of a rod mounted to rotate in said frame, a stop-arm on the rod adapted for contact with a stop-lug on the carriage, a key-lever connected with said rod and adapted to rotate the same to swing said stop-arm out of the path of said lug, a rotative platen on the carriage, a ratchet-wheel on the platen-shaft, an oscillatory, endwise-movable, spring-actuated, actuating-arm, a sliding knob on the platen-shaft by which the actuating-arm is given endwise movement, an oscillatory gear-segment mounted concentrically with respect to the platen-shaft, and with which the actuating-arm has endwise-sliding engagement, a second oscillatory gear-segment mounted on the carriage and intermeshing with the first gear-segment, and an endwise-movable rod attached to said gear-segment and having sliding engagement with said lug and



adapted for contact with said stop-arm in advance of the lug to oscillate the second gear-segment.

7. The combination with a carriage and a platen, of two presser-rollers acting to press the paper against the platen, a floating frame embracing two end bars in which said rollers are journaled, said end bars being loosely connected with the carriage, springs applied to said end bars to press said end bars toward the platen, and means acting on both of said end bars to throw said rollers away from the platen.

8. The combination with a carriage and a platen, of two presser-rollers acting to press the paper against the platen, a frame in which said rollers are mounted, said frame being loosely connected at its ends with the carriage, springs applied to press said frame toward the platen, a horizontally-arranged actuating-shaft mounted on the carriage, and operative connections between said shaft and both ends of the said frame constructed to throw the frame away from the platen when the shaft is turned.

9. The combination with a carriage and a platen, of two presser-rollers acting to press the paper against the platen, a frame in which said rollers are mounted, said frame being loosely connected at its ends with the carriage, springs applied to press the said frame toward the platen, a longitudinally-arranged actuating-shaft provided with eccentrics, and push-bars at the ends of the carriage which are engaged with said eccentrics and act on the ends of said frame.

10. The combination with a carriage and a platen, of two presser-rollers, a floating frame embracing two end bars in which the said rollers are journaled, and a longitudinal bar connecting said end bars, said frame having sliding connection at its ends with the carriage enabling it to move toward and from the platen, a longitudinally-arranged actuating-shaft provided with eccentrics and push-bars which engage the eccentrics and act against both ends of said floating frame.

11. The combination with a carriage and a platen, of a presser-roller located below the platen and held by spring-pressure in contact therewith, two presser-rollers located between said first-mentioned roller and the printing-line, a floating frame embracing two end bars in which the two last-mentioned rollers are mounted, springs acting on said end bars to hold the two last-mentioned rollers against the platen, and means for simultaneously moving all of said rollers away from the platen embracing parts which act on both ends of said lower roller and on both of said end bars of the floating frame.

12. The combination with a carriage and a platen, of a presser-roller located below the platen, spring-arms attached to the carriage upon the free end of which said roller is mounted, two rollers for holding the paper against the platen as it approaches the striking-point

of the type, a floating frame in which said two rollers are mounted, a rock-shaft mounted in the carriage above said spring-arms and provided with cam projections which act upon the spring-arms to depress the lower roller away from the platen, and endwise-movable push-bars which are acted upon by said rock-shaft to throw said floating frame and the rollers carried thereby away from the platen when the latter is rocked to depress the lower roller.

13. The combination with a paper-carriage and a platen mounted therein, of two presser-rollers for holding the paper against the platen as it approaches the striking-point of the type, a floating frame for supporting said rollers embracing two end bars in which the rollers are journaled, a rock-shaft mounted in the carriage, two endwise-movable push-bars actuated by said rock-shaft and engaging the ends of the floating frame to move the latter and the rollers carried thereby away from the platen when the shaft is rotated.

14. The combination with a paper-carriage provided with end plates and a platen mounted thereon, of two presser-rollers for holding the paper against the platen as it approaches the striking-point of the type, a floating frame for supporting said rollers, embracing two end bars in which the rollers are journaled, a rock-shaft mounted in the end plates of the carriage and provided with eccentrics and endwise-movable push-bars mounted on said carriage end plates engaging said eccentrics, said push-bars being adapted to act at their outer ends against the ends of the floating frame.

15. The combination with a carriage having end plates and a platen, of two presser-rollers, a floating frame embracing two end bars in which the rollers are journaled and a longitudinal bar connecting said end bars, said frame being movably supported on the carriage by means of slots in the end plates thereof and outwardly-projecting pins on said end bars which engage said slots, and springs applied to throw said frame toward the platen.

16. The combination with a paper-carriage and a platen mounted therein, of two presser-rollers for holding the paper against the platen as it approaches the striking-point of the type, a floating frame, embracing end bars and a longitudinal bar connecting said end bars, said rollers being journaled in said end bars and a guide-plate attached to said frame between said rollers, pivotal and sliding connection between the ends of the floating frame and the carriage and springs attached to the carriage and bearing against said frame to press the rollers against the platen.

17. The combination with a paper-carriage provided with end plates and a platen mounted therein, of two presser-rollers for holding the paper against the platen as it approaches the striking-point of the type, a floating frame embracing end bars in which the rollers are



journalled, and a longitudinal bar connecting said end bars being provided with outwardly-extending pins which engage slots in the end plates of the carriage and afford pivotal and sliding connection of the floating frame with the carriage.

18. The combination with a paper-carriage and a rotative platen thereon, of an automatic line-spacing mechanism comprising a radial arm which is adapted to be locked to the platen to rotate with the same, a spring-pressed stop-plate which has sliding and pivotal movement on the carriage-frame and is provided with a stop-arm which limits the throw of said radial arm, said stop-plate being provided with a plurality of notches or recesses which are severally adapted for engagement with a stationary stop-pin on the carriage-frame, whereby the throw of the radial arm may be varied.

19. The combination with a paper-carriage and a rotative platen thereon, of an automatic line-spacing mechanism comprising a radial arm which is adapted to be locked to the platen to rotate with the same, a stop-plate provided with a slot through which the platen-shaft passes and with a stop-arm which limits the throw of said radial arm, said stop-plate being provided on its end margin with a plurality of notches adapted to engage a stationary stop-pin on the carriage, and a spring for yieldingly holding said plate engaged with said stop-pin.

20. The combination with a paper-carriage and a revolving platen thereon, of an automatic line-spacing mechanism comprising a ratchet-wheel on the platen-shaft, an oscillatory, endwise-movable, platen-actuating arm, a sliding knob on said shaft by which the actuating-arm is given movement, an oscillatory gear-segment mounted concentrically on the platen-shaft and with which said actuating-arm has endwise-sliding engagement, a second oscillatory gear-segment mounted on the carriage and intermeshing with the gear-segment first mentioned, means acting on said second gear-segment in the endwise movement of the carriage, operating to turn the gear-segments and a spring-pressed stop-plate which has sliding and pivotal connection with the carriage and is provided with a stop-arm which limits the throw of said first-mentioned gear-segment, said stop-plate being provided with a plurality of notches or recesses which are severally adapted for engagement with a stationary stop-pin on the carriage, whereby the throw of said first-mentioned gear-segment may be varied.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 20th day of July, A. D. 1901.

THERON L. KNAPP.

Witnesses:

D. R. JOSLYN,  
EMIL ARNOLD.