

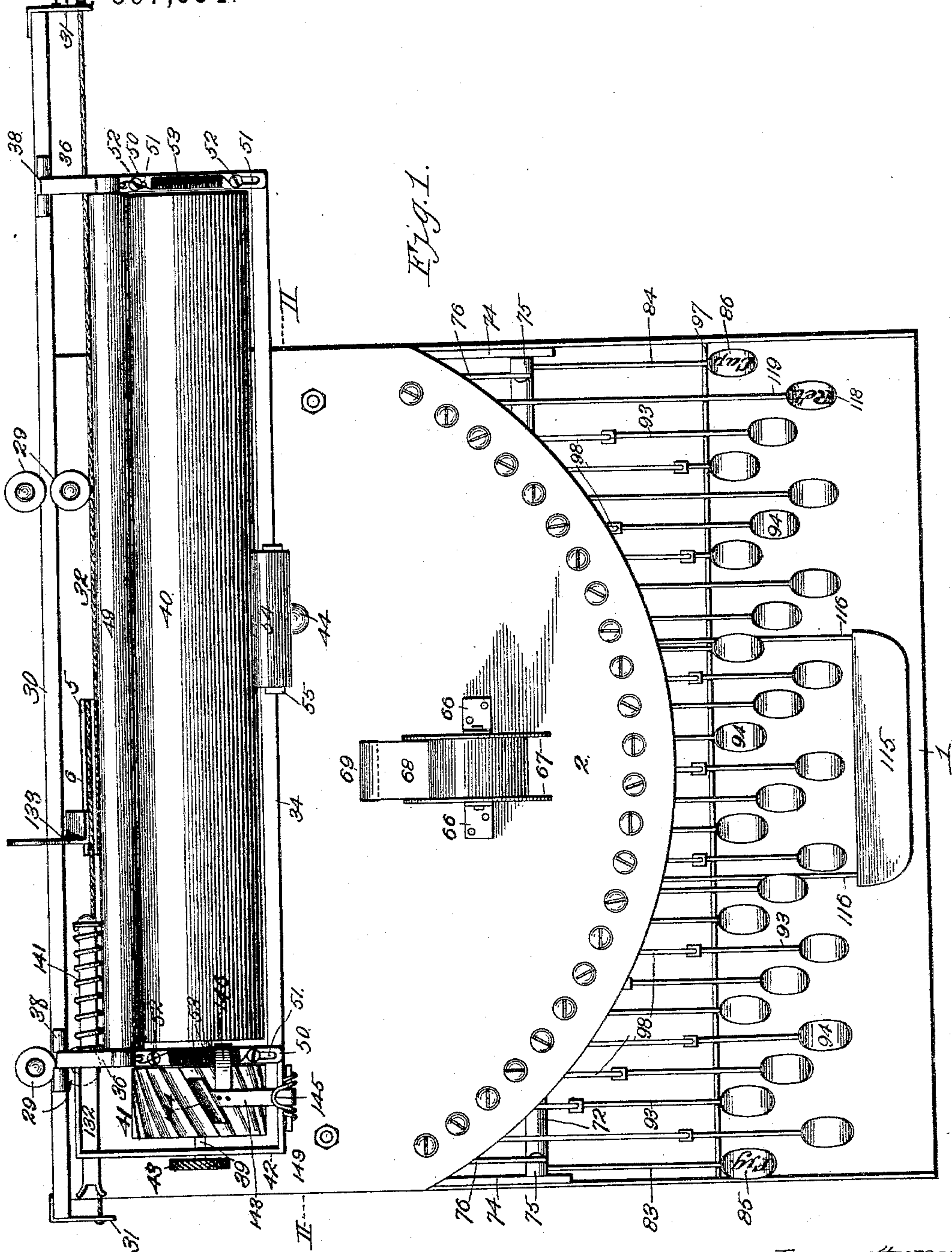
(No Model.)

5 Sheets—Sheet 1.

F. F. ANDERSON & T. KRAUSS.  
TYPE WRITING MACHINE.

No. 597,664.

Patented Jan. 18, 1898.



Witnesses:

M. Remley.  
L. R. Proctor

Inventors:

F. F. Anderson & T. Krauss:

by Higdon & Higdon  
attys



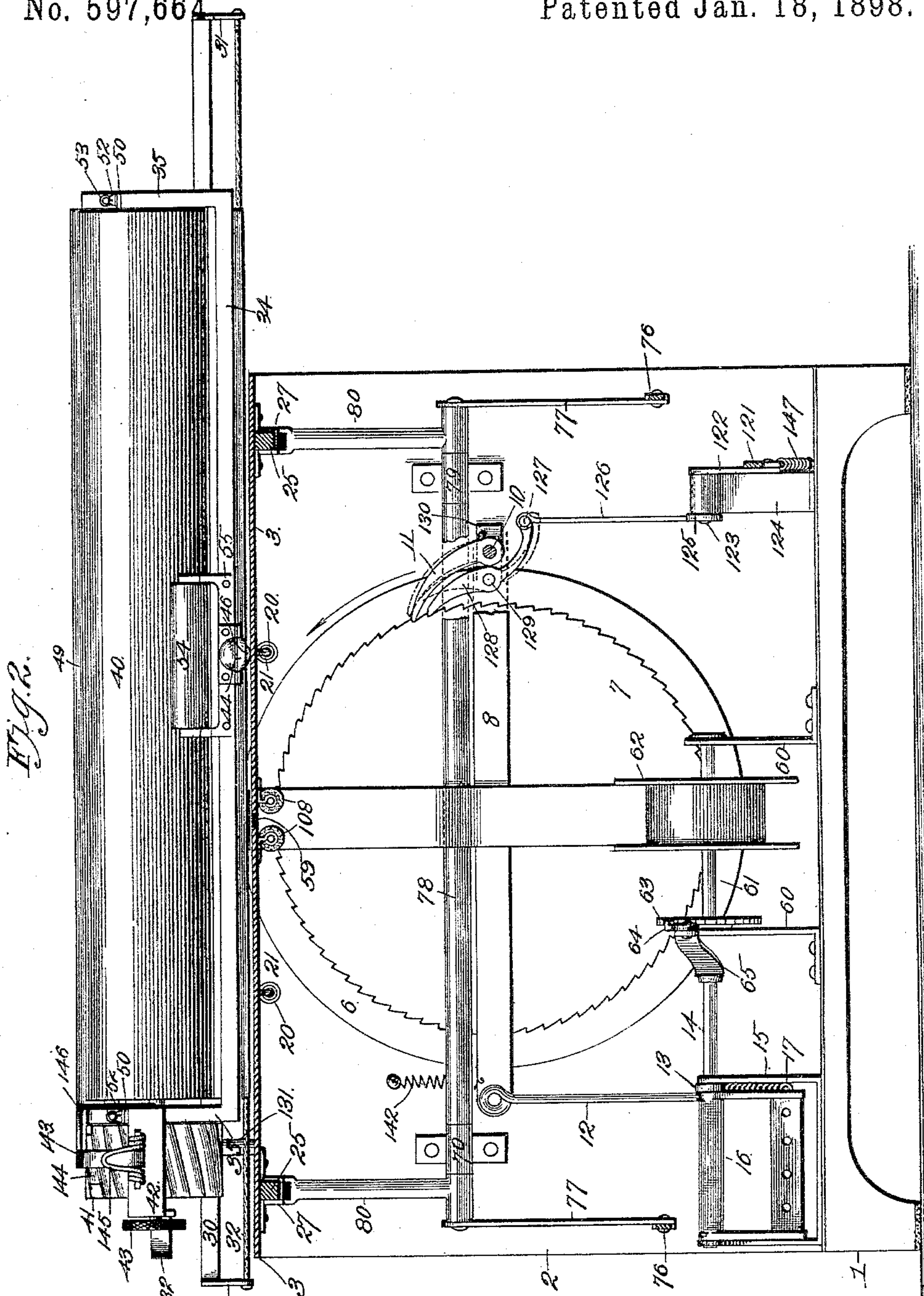
(No Model.)

5 Sheets—Sheet 2.

F. F. ANDERSON & T. KRAUSS.  
TYPE WRITING MACHINE.

No. 597,664

Patented Jan. 18, 1898.



Witnesses:

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G. P. Thorpe.

Inventors:

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5 Sheets—Sheet 3.

Patented Jan. 18, 1898.





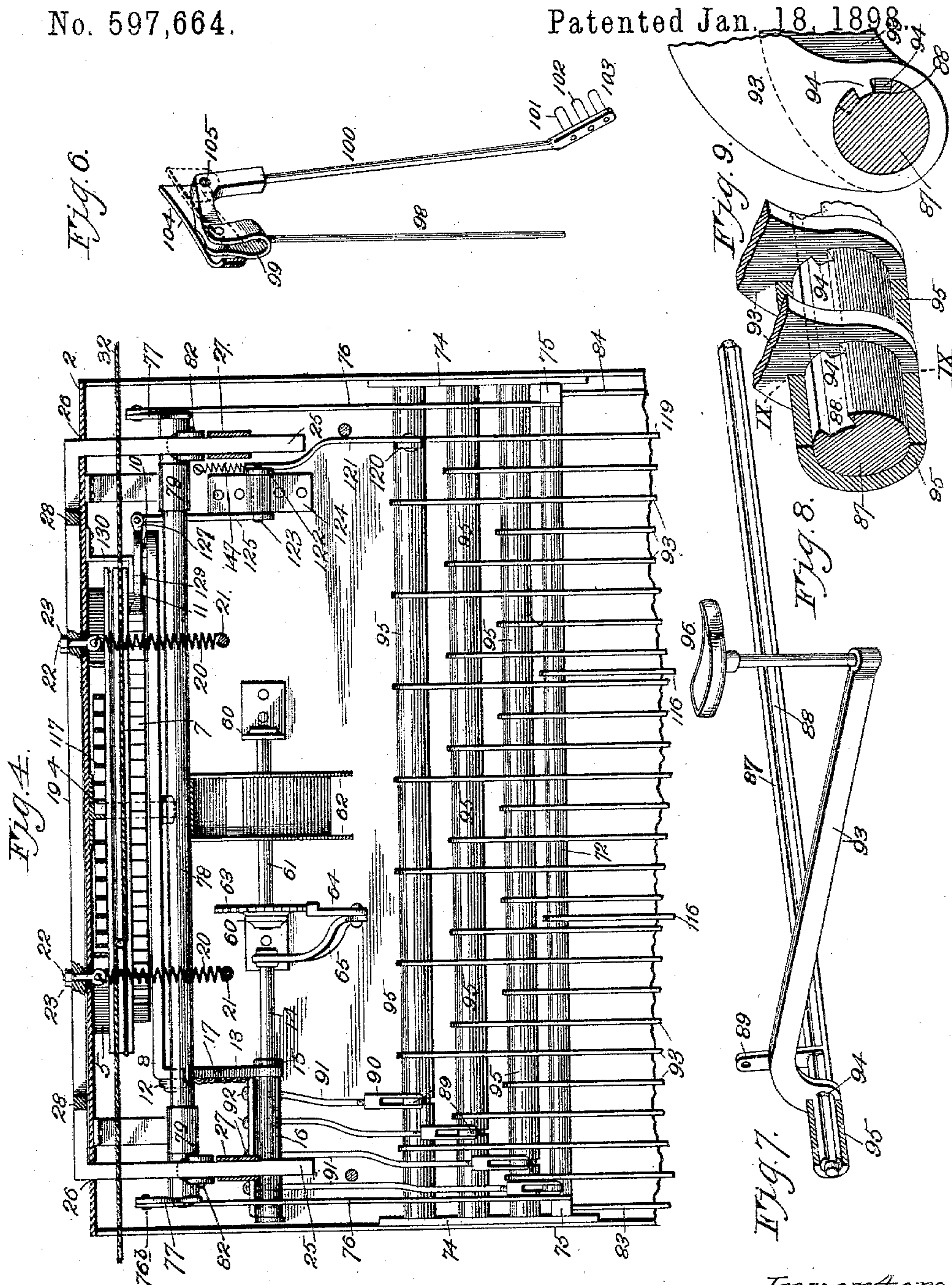
(No Model.)

5 Sheets—Sheet 4.

F. F. ANDERSON & T. KRAUSS.  
TYPE WRITING MACHINE.

No. 597,664.

Patented Jan. 18, 1898.



Witnesses:

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Inventors:

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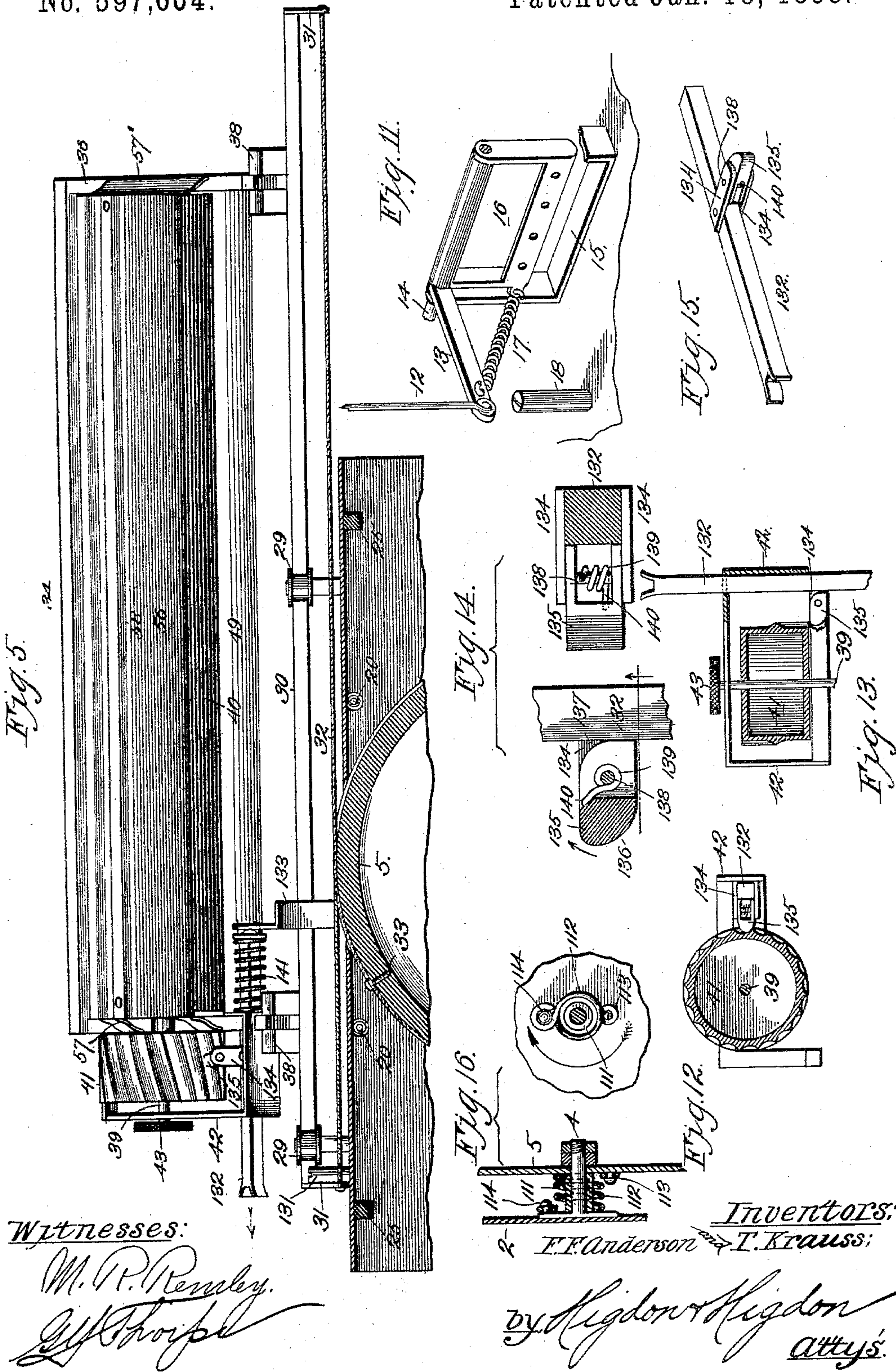
(No Model.)

5 Sheets—Sheet 5.

F. F. ANDERSON & T. KRAUSS.  
TYPE WRITING MACHINE.

No. 597,664.

Patented Jan. 18, 1898.





# UNITED STATES PATENT OFFICE.

FREDERICK F. ANDERSON, OF KANSAS CITY, MISSOURI, AND THEODORE KRAUSS, OF ARGENTINE, KANSAS, ASSIGNORS OF ONE-EIGHTH TO VALENTINE SEESER, OF KANSAS CITY, MISSOURI.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 597,664, dated January 18, 1898.

Application filed November 2, 1896. Serial No. 610,889. (No model.)

*To all whom it may concern:*

Be it known that we, FREDERICK F. ANDERSON, of Kansas City, Jackson county, Missouri, and THEODORE KRAUSS, of Argentine, Wyandotte county, Kansas, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part thereof.

Our invention relates to type-writing machines; and our object is to produce a machine of this character by which a greater amount of work can be done than with the type-writing machines in general use in the same length of time and which is positive and reliable in operation.

A further object of the invention is to produce a type-writing machine which is simple, durable, and can be manufactured and sold for much less than any other standard machine on the market.

To these ends the invention consists in certain novel and peculiar features of construction and combinations of parts, as will be hereinafter described and claimed.

In order that the invention may be fully understood, we will proceed to describe it with reference to the said accompanying drawings, in which—

Figure 1 represents a plan view of a type-writing machine embodying our invention. Fig. 2 represents a vertical section of the same, taken on the line II II of Fig. 1 and partly broken away. Fig. 3 represents a vertical cross-section taken centrally of the machine. Fig. 4 represents a horizontal section taken just below the top plate of the machine. Fig. 5 represents a vertical section taken through the cable-wheel and also shows the carriage thrown back to the position it occupies when exposing the printed characters. Fig. 6 represents in detail a view of one of the type-levers and its operative connections and support. Fig. 7 is a perspective view of one of the shafts provided with one of our improved key-levers. Fig. 8 is a detail perspective view enlarged to show more clearly the construction and relation between said key-levers and shaft. Fig. 9 is a cross-section of the same, taken on the line IX IX of

Fig. 8. Fig. 10 is a detail view of the ball-bearing support for the front side of the carriage. Figs. 11, 12, 13, 14, and 15 are detail views. Fig. 16 is a detail sectional view to illustrate clearly the spring for returning the carriage back to its starting-point at the proper time. Fig. 17 is a detail perspective of the carriage-frame.

Like numerals designate corresponding parts in all of the figures.

1 designates the bed or bottom, 2 the back, and 3 the top plate of a type-writing machine.

4 designates a forwardly-projecting horizontal shaft, which is secured in any suitable manner centrally to the back plate, and mounted rotatably thereon is a belt or cable wheel 5, preferably curved, as shown, and projecting upwardly a slight distance through a slot 6 in the top plate. Said wheel is provided or formed integrally with a ratchet-wheel member 7. Mounted pivotally upon said shaft at the front side of the said wheel is a walking-beam 8 and it is held reliably in place by means of a retaining-nut 9. Said walking-beam at one end is provided with a pin 10, on which is pivotally mounted a gravity-pawl 11, engaging the ratchet member of said wheel. The opposite end of said walking-beam is pivotally connected by a pull-rod 12 to the front end of the arm 13 of a shaft 14. Said shaft is journaled in the upper end of a U-shaped bearing-bracket 15, secured to the bed-plate of the framework. A swinging frame 16 is mounted pivotally upon said shaft and is connected by means of a comparatively stiff spring 17 at its lower end with the free end of the arm 13. By this means it is obvious that by moving forward the lower end of the pendent frame 16 the shaft 14 is rotated and the arm 13 moved downwardly until it comes in contact with the stop-pin 18. Further movement of said shaft and arm is thereby arrested; but the pendent frame continues to move forwardly until the type-lever has come in contact with and made the required impression upon the paper. The object of the arrangement of the mechanism just described will be explained hereinafter and also the means for causing such movement of the swinging frame.

The carriage-support and transverse ad-



juster are constructed as follows—that is to say, 19 designates a bar which is normally held by means of the springs 20 against the rear side of the back plate of the machine, 5 said springs, as illustrated clearly in Figs. 2 and 4, being attached at their front ends to pins 21, depending from the top plate, and at their rear ends to eyebolts 22, projecting through the back wall of the frame and secured by retaining-nuts 23 to said bar 19. At 10 its opposite ends said bar is provided with the arms 25, which project forwardly through openings 26 in the back wall and extend through guide-clips 27, secured to the under 15 side of the top plate, as shown most clearly in Fig. 2. A short distance inward from each arm 25 the bar 19 is provided with an upward T-shaped extension 28, which extends transversely of and overlaps the top plate at one 20 end, preferably, and journaled vertically upon said T-shaped extensions or arms are flanged guide-rollers 29. 30 designates a bar which extends longitudinally of the machine and is supported by and between said guide-rollers, 25 and is provided at its opposite ends with the forwardly-projecting and depending arms 31, to which are attached the opposite ends of the belt or cable 32, extending around the 30 rigidly at a suitable point, as shown at 33, to prevent any slipping movement that might otherwise take place.

The carriage-frame comprises the longitudinal bar 34, arranged just above the top 35 plate and a suitable distance in advance of and parallel with the bar 30, the upwardly-projecting arms 35 at its opposite ends and the rearwardly-projecting inverted-L-shaped arms 36, which are hinged, as shown at 37, to 40 the arms 38, projecting rigidly upward from the bar 30. A shaft 39 is journaled in said transverse arms 36 of the frame, and mounted rigidly thereon is the paper-cylinder 40. Mounted rigidly also on said shaft at the end 45 of the cylinder toward which the carriage travels in printing operation is a spirally-toothed cam-wheel 41, and said wheel is preferably incased in a frame 42, carried by the carriage-frame. The corresponding end of 50 the shaft is also provided, preferably, with a head in the form of a milled disk or wheel 43, whereby the paper may be adjusted, if desired.

The carriage-frame is provided with a ball-bearing at its front side in order that it may 55 freely move back and forth or longitudinally. This ball-bearing comprises the hemispherical cap 44, provided with an angle-arm 45, the ball 46, which fits into said hemispherical 60 cap or socket and upon the top plate of the framework, and the annular band 47, provided with a horizontal arm 48, said band encircling said ball snugly below its center and having its arm 48 fitting against the horizon- 65 tal arm of the angle-arm 45 and secured permanently thereto and to the middle of the bar 34 of the carriage by rivets (not shown)

or in any other suitable manner. By this arrangement it is obvious that when the carriage is elevated in order to expose the work 70 or for any other reason the ball-bearing is elevated from the top plate of the machine without danger of the ball dropping out of position.

In order to maintain the paper in the proper 75 position with relation to the cylinder or feed-roller 40, the roller 49 is arranged at the rear and upper side of said cylinder and is journaled at its opposite ends in bearings formed at the rear ends of the plates 50, resting upon 80 the arms 36 of the carriage-frame, said plates being provided with slots 51, which engage guide screws or pins 52, projecting upwardly from said arms. In order to hold said roller toward the cylinder with a yielding pressure, 85 a pair of retractile springs 53 are employed, said springs being attached at their front ends to the foremost bolts or guide-pins 52 and at rear ends to lugs projecting from the bearings of said rollers, as shown clearly in 90 Fig. 1. At the front side of the cylinder and below its center is arranged a second guide-roller 54, said guide-roller being journaled in a bracket 55, secured to the bar 34 of the carriage. 95

Arranged longitudinally and below the center of the cylinder is a segmental platen or 100 plate 56, and said platen is held rigidly in such position by means of the arms 57 57', which connect its opposite ends with the arms 36 of the carriage, as shown most clearly in Figs. 3 and 5. Said platen may be of any suitable material which provides the requisite stiffness, and preferably at its center is provided with a longitudinal rib 58, which forms 105 the platen or printing-surface proper. This rib will preferably be of rubber and of width only to cover a single type at a time, so that it will be impossible for two impressions to be made upon the paper at one key depression. When the carriage is in its normal 110 position—that is, in the position it occupies when the small letters are being printed—the platen is over the front end of the transverse slot or elongated opening 59 in the top plate, as shown clearly in Fig. 3. When 115 capital letters are to be impressed upon the paper, the carriage is moved, in the manner and by the mechanism hereinafter described, rearward until said platen is vertically over 120 the middle of the slot, and when figures and punctuation-marks are to be printed the carriage is moved rearwardly until said platen is over the rear end of said slot, as will be hereinafter more fully explained. 125

Referring now to the ribbon-feeding mechanism, 60 designates a pair of brackets which are secured to the bed-plate of the machine in advance of the belt or cable wheel, and 61 a shaft journaled therein and carrying a reel 130 62 and ratchet-wheel 63, which ratchet-wheel is engaged by a gravity-pawl 64, pivotally mounted on an arm 65, projecting rigidly from the extension of the shaft 14, hereinbe-



fore described, as shown clearly in Figs. 2 and 4. A pair of brackets 66 are secured upon the top plate 2, and journaled upon a shaft therein is a reel 67. The opposite ends of the ribbon 68 are attached to said reels, said ribbon extending from the top reel through an opening 69 in said top plate and rearwardly beneath the same to a point just in advance of the slot 59. At such point it extends upwardly through an opening 70 in the top plate, thence rearwardly through the opening 59, and down again through an opening 71 in the top plate to the reel 62, as shown clearly in Fig. 3. By this arrangement it is obvious that each forward movement of the frame 16, and consequent oscillation of the shaft 14, causes, through the medium of the pawl 64 and the ratchet-wheel 63, a rotatable movement of the reel 62 and a longitudinal movement of the ribbon.

It is obvious from the peculiar arrangement of the ribbon—that is, from its frictional contact in several places with the frame—that it will be unnecessary to provide a brake to check the movement of the reel 67, as said reel never acquires sufficient momentum to loosen the ribbon thereon.

72 designates a shaft which extends transversely of and a slight distance above the bed-plate and is journaled at its opposite ends in bearing-plates 74 or their equivalents. Mounted pivotally upon said shaft are the arms 75, and said arms are pivotally connected by means of the links 76 with the depending arms 77 of the shaft 78, said link 76 being provided with longitudinal slots 76<sup>a</sup>, which fit loosely upon pins 76<sup>b</sup> of said depending arms. The shaft 78 is journaled in bearing brackets or sleeves 79, secured to and projecting forwardly from the back wall 2 of the frame, and said shaft is also provided with the upwardly-projecting arms 80, having longitudinal slots 81 in their upper ends, which pivotally engage pins 82, projecting laterally from the forwardly-projecting arms 25 of the bar 19. Projecting forwardly from said arm 75 are levers 83 and 84, and carried thereby at their outer ends are the keys 85 and 86, respectively. By depressing the key 85 the corresponding arm 75 is pivotally operated and through the medium of its connecting-link 76 rotates the shaft 78 and, overcoming the resistance of the springs 20, moves the bar 19, and consequently the carriage, rearwardly until the platen 58 occupies a position over the rear end of the slot 59. When in this position, which is maintained as long as said key is depressed, figures, punctuation-marks, and other symbols may be printed upon the paper, which extends between the cylinder and the rollers 49 and 54 and against the face of said platen, as shown clearly in Fig. 3. When said key is released, the springs 20 return the carriage, said key, and the connected parts to their original positions. It will be observed in this connection that, owing

to the fact that the links 76 are provided with the slots 76<sup>a</sup>, the operation of the key 85, and consequently the depending arms of said rock-shaft, does not affect the position of the key 86, as the pin of the arm engaging the same slides inoperatively in its slot. The same is true of the key 85 when the key 86 is depressed. The only difference in operation between the said keys is a difference of degree—that is to say, the depression of the key 85 throws the carriage back twice as far as the depression of the key 86. The depression of the latter key throws the platen over the center of said slot 59, in order to receive impressions of capital letters, as will be readily understood.

Arranged rearwardly, preferably, of the shaft 72 and journaled, preferably, in the same bearing-plate are shafts 87, and each is provided for its full length with a longitudinal slot 88 and with an upwardly-projecting arm 89, and said arms are connected, through the medium of the adjustable clips 90 and the rods 91, with the swinging frame 16, hereinbefore referred to. Said rods extend through apertures in said frame and are provided with heads or enlargements at their rear ends, as shown at 92. Mounted upon said shafts are the requisite number of forwardly-projecting key-levers 93. Said key-levers loosely encircle said shafts and are each provided with a tooth or lug 94, which projects into the slot 88 of its corresponding shaft, said teeth or lugs being narrower than said slots and normally resting upon or against the shoulder at the lower side of the slot in order that when one key is depressed the shaft may be operated the requisite distance to cause its corresponding arm 89 to operate the swinging frame 16 without affecting the position of any of the other key-levers upon said shaft. In other words, the depression of one of said keys causes the shaft to rotate until the shoulder at the upper side of the slot reaches the tooth of the remaining levers, which consequently are not moved, and as the key is released said swinging frame rotates the shaft back to its original position and consequently reelevates the key. The operative relation between said shafts and keys will be more readily understood by reference to Fig. 9. In perspective view it will be noticed that the keys occupy their normal positions relative to the shaft—that is, the keys rest upon the shoulder at the lower side of the slot. In sectional view it will be noticed that one key is depressed and the shaft rotated until the upper shoulder of said slot comes against the tooth of the other key, which has not been moved. Immediately the depressed key is released the shaft moves back to the positions shown in dotted lines and its lower shoulder or wall comes against the under side of said tooth, the depressed key, of course, being reelevated. The relative distance between said keys is maintained



continuously by the spacing sleeves or cylinders 95, which encircle the shafts, as shown clearly.

The key-levers carry at their outer ends 5 vertical rods provided with keys 96 at their upper ends. Said keys, like the keys 85 and 86, already referred to, are of elongated form from front to rear in order that each key may have inscribed thereon three characters or 10 symbols—viz., a small letter, a capital letter, and a figure or punctuation-mark—and that more space may be left between said keys than is provided when circular keys are used, and consequently there is less opportunity 15 for an operator in rapidly operating a machine to strike two keys simultaneously. By elongating said keys their width obviously may be lessened, and in order to provide a more natural bearing for one's fingers said 20 keys are preferably concaved slightly, as shown. The key-levers are guided in the vertically-slotted guide-bar 97, extending transversely of the bed-plate, and are each connected by a rod 98 to a U-shaped clip 99, 25 preferably of spring metal. Said clip embraces and is pivotally connected to the heels of the type-levers 100, which levers are provided each with three type 101, 102, and 103, respectively, for printing small letters, capitals, and figures or punctuation-marks. Said 30 type-levers 100 are embraced at their opposite sides by spring-clips 104 and are pivotally mounted on pins 105, carried by said clips. The clips are fitted up against the bot- 35 tom of the top plate and are so secured by means of screw-bolts 106 and clamping-nuts 107, said clips being arranged in a curved line, as shown.

In order to insure that the type will strike 40 the ribbon at the proper point, a pair of guide-rollers 108 are arranged below and at opposite sides of the slot 59 in the top plate, as shown clearly in Figs. 2 and 3. By this arrangement it is obvious that the letters im- 45 printed upon the paper will all be in perfect alinement, as the type will be guided accurately to its proper point by means of said rollers. The type-levers are limited as to downward movement by the usual stop-bar 50 109, which is secured at its opposite ends in any suitable manner in the vertical standards 110, forming part of the framework.

In order to return the carriage back to its proper position for the beginning of a new 55 line, we preferably arrange around the shaft or axle 4 and around the hub 111 of the wheel 5, as shown in Fig. 16, a stiff spiral spring 112 and secure its opposite ends to pins 113 and 114, secured, respectively, to said 60 wheel and to the back wall of the framework. As the carriage is moved forward with each depression of a key or of a spacing-bar 115, provided with levers 116, secured rigidly to the shaft 72, the rotation of the wheel 5 winds 65 up said spring, but owing to the fact that it is of greater diameter than the hub which it encircles it is obvious that there is no fric-

tional contact between it and said hub, and consequently the keys may be depressed more easily and rapidly than in any machine which 70 employs an ordinary barrel or clock spring for this purpose, though it is understood, of course, that we may employ an ordinary clock-spring in lieu of the spring 112, if de- 75 sired. Such a spring we have illustrated in Figs. 3 and 4 and numbered it 117. Said spring is secured at one end, preferably, to the stationary shaft 4 (the hub of the wheel 5 being dispensed with) and at its opposite 80 end to said wheel 5.

To return the carriage to its original posi- 85 tion at any time, we have provided a special key 118, mounted at the free end of a lever 119, which lever is pivotally connected to an arm 120, projecting rigidly from one of the 85 shafts 87, as shown clearly in Fig. 4. Said arm is also pivotally connected by a link 121 to the depending arm 122 of the shaft 123, said shaft being mounted in a bearing-bracket 124, secured to the bed-plate, and having a 90 horizontal rearwardly-projecting arm 125, connected by a rod 126 to the arm 127 of a pawl or dog 128. Said dog is pivotally mounted, as at 129, upon a bracket 130, secured to the back wall of the casing, and engages the 95 ratchet-section 7 of the wheel 5 just below and in the vertical plane of the pawl 11, so that by the operation of said return-key 118 the dog 128 trips the pawl 111 and permits 100 the spring 112 or 117, as the case may be, to rotate the wheel backward, and consequently return the carriage to its original position, the carriage being arrested at the proper point by means of the stop-pin 131.

In order to automatically rotate the cylin- 105 der and consequently space for each new line, a sliding bar 132 extends through the frame 42 and in longitudinal alinement with a bracket 133, secured upon the top plate of the machine and adapted to be shifted lon- 110 gitudinally thereon for a purpose which will presently appear. Said bar is provided with a pair of ears 134 at a suitable point, and between them is pivotally mounted the dog 135. Said dog is rounded at its front end, as shown 115 at 136 at one corner, and diagonally opposite said corner it is rounded at its rear end, as shown at 137. It is pivotally mounted near its middle upon a pin 138, carried by the ears 134, and is bifurcated, and spirally encircling 120 said pin and secured thereto at one end is a spring 139, which bears at its opposite end with a yielding pressure against the dog forward of its pivot, so as to hold its rear end pressed yieldingly against the bar 132, which 125 limits its operation in the direction opposite to that indicated by the arrow, Fig. 14. When the bar 132 is in its normal or retracted position—that is, when the spring 141, which encircles it and bears at its opposite ends 130 against the frame 42, and the head or enlargement at the rear end of said bar is expanded—said dog is just rearward of the cam-wheel 41, so that when the bar is moved or



slid in the direction indicated by the arrow, Fig. 5, it engages one of the spiral flanges or ribs of said wheel and causes the cylinder to rotate a certain distance, the distance being determined by the length of movement of said bar. For instance, when it is desired to space only a single line the stop-bracket 133 occupies a point upon the top plate, which bears such relation to the stop-pin 131 that the spring 141 will be compressed only sufficient to force the dog to engage one spiral flange or rib of the cam-wheel for half its length, and consequently turn the cylinder only the distance mentioned. When it is desired to leave a double space between the lines, said bracket 133 is shifted upon the top plate to a point nearer said stop-pin 131, so that when the carriage returns and the head of said sliding bar strikes the bracket the spring 141 will be compressed as before, and the bar slid forward a distance equal to or slightly exceeding the width of the cam-wheel 41, and consequently by engaging one of its spiral flanges or ribs for its full length will turn the carriage and therefore feed the paper sufficiently for double-spaced writing, as will be readily understood. As the new line is printed and the carriage advances, the pressure on the spring is ultimately removed to permit it to return the dog to its original position at the inner side of the cam-wheel, that it may rotate the cylinder another step when the carriage recedes under the action of its returning spring. This backward-sliding movement of the bar 132 is more particularly described hereinafter.

In order that the walking-beam may be returned to its original position after each depression, we employ the retractile spring 142, secured at its opposite ends to said beam and to a pin projecting from the back wall of the framework, as shown clearly in Fig. 2; but it is to be understood that the spring 17, which connects the frame 16 and the arm 13 of the shaft 14, is of such strength that when said swinging frame is operated it instantaneously imparts a corresponding movement to the rock-shaft and the walking-beam, overcoming the resistance of the spring 142 and the springs 112 and 117, as the case may be, for returning the carriage to its original position, and at the same time adjusts the ribbon. Immediately the arm 13, however, strikes the pin 18 the movement of said shaft and said walking-beam is arrested, while that of the swinging frame continues, owing to the stretching of the spring 17. This arrangement is provided in order to insure that the carriage and the ribbon have come to a full stop before the key strikes the latter and makes the required impression upon the paper, thereby insuring against blurred work. In practice, by the time the type-lever has completed three-fourths of its upward stroke the carriage and ribbon have come to a full stop and are prepared to receive the stroke of said type-lever.

In order to limit the rotatable movement of

the cylinder to the exact distance required, we provide a friction mechanism which engages the cam-wheel and which is constructed as follows: 149 designates a pin suitably supported at the front side of the frame 42, and 143 a curved arm which terminates in a shoe 144 at its free and upper end, adapted to engage successively the grooves formed between each pair of the spiral flanges or ribs of the cam-wheel. In order to hold this brake-shoe with a yielding pressure in such position, we employ a spring 145, which bears at its middle against said arm above its pivot and has its ends coiled around the pin 149 and secured thereto or to the frame, at its ends. To assist said spring in holding said brake-shoe in place, though principally to prevent any lateral or twisting movement of the brake-shoe, the spring-arm 146 is connected at its opposite ends to the arm 143 and to the adjacent arm 36 of the carriage.

In case it is necessary or desirable after a line has been printed to return the carriage for only half its distance or any distance short of the full distance the curved outer or front end of the bar 132 is grasped and at the same time the return-key 118 is depressed. The depression of said key causes the operation of the dog 128 and throws it and also the pawl 11 out of engagement with the ratchet-section of the wheel 5. Immediately this takes place the spring 112 or 117, as the case may be, rotates said wheel backward, and overcoming the pressure of the spring 141 causes the dog 135 to rotate the cylinder and feed the paper to space for a new line. The grip upon the said bar 132 retards the return movement of the carriage, so that it can be stopped just at the required point, the return-key of course being released, so as to permit the spring 147 to cause the reengagement of the dog 128 with the ratchet-wheel, the gravity or spring-actuated dog 11 automatically reengaging said wheel also, as will be readily understood, and holding the carriage at such point. The bar 132 then being released, the spring 141 slides it back to its original position, the dog 135 of course yielding pivotally as it engages the cam-wheel on its back motion to accommodate or permit this return movement. The rounded shoulder 137 makes this pivotal movement possible, and the shoulder 136 facilitates such movement when the dog is arranged as shown. It will be understood, of course, that the wheel 43 may be grasped in order to retard the return movement of the carriage, so that it can be stopped at any intermediate point; but it is equally obvious that it will require an additional movement of the hand in order to rotate said wheel and thereby space for a new line. This operation of course would require a little more time than is occupied by grasping the bar 132.

One particular feature of this machine which possesses great advantages over those in general use is the platen or printing-surface carried rigidly by the carriage and en-



tirely independent of the cylinder or feed-roller for the paper. By employing a platen or printing-surface of this character it is obvious than an absolutely square face or surface is always presented for the impact of the type, and consequently the latter will make at all times, provided they are kept clean, a perfect impression upon the paper, because the platen provides a resistance for the entire surface of the type, and consequently the impression made is clear and perfectly defined.

With machines employing a cylindrical feed-roller also, as the platen or printing-surface, it is obvious that when the bearings of the type-levers become slightly worn they do not always strike squarely against the paper, owing to the fact that the printing-surface is slightly rounded. With the flat platen or printing-surface we employ it does not affect the quality of the work, whether the type-lever bearings are absolutely perfect or not, as the type when arrested by said surface will be caused to impinge squarely thereagainst. This action, however, is made more positive and reliable by the use of guide-rollers. This flat platen also is an improvement over the calligraph-cylinder, as the flat surfaces of the latter, after the bearings of the cylinder and other parts of the machine have become somewhat worn, are not always presented squarely to receive the type-impression, and consequently ragged work is the result.

Another feature to be noted is the spring-clips 104, which embrace the type-levers, as shown most clearly in Fig. 6. Said clips at their free ends provide a continuous but yielding pressure at opposite sides of the type-levers, and as the clips themselves are fixed rigidly to the top plate of the machine it is obvious that the wearing of the bearings or pivots of said type-levers does not affect their alinement. The connection between the pull or link rods 98 and said type-levers is of the same character.

A recapitulation of the entire operation is not believed to be necessary, and it is to be understood, of course, that various changes in the form, proportion, and detail construction of the parts will be made and that mechanical equivalents may be substituted for the different parts without departing from the spirit and scope or sacrificing any of the advantages of our invention.

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

1. A type-writing machine, comprising a suitable frame, a traveling carriage thereon, a wheel having a ratchet-section, mounted in the frame, a belt or cable engaging said wheel and attached at its ends to said carriage, a walking-beam carrying a pawl engaging said ratchet-section, a shaft provided with an arm connected to said walking-beam, a swinging frame mounted on said shaft, a spring con-

necting said shaft-arm and swinging frame, and means to operate said frame, for the purpose set forth.

2. A type-writing machine, comprising a suitable frame, a traveling carriage thereon, a wheel having a ratchet-section mounted in the frame, a belt or cable engaging said wheel and attached at its ends to said carriage, a walking-beam carrying a pawl engaging said ratchet-section, a shaft provided with an arm connected to said walking-beam, a swinging frame mounted on said shaft, a spring connecting said shaft-arm and swinging frame, and depressible keys to operate said swinging frame, substantially as described.

3. A type-writing machine, comprising a suitable frame, a traveling carriage thereon, a wheel having a ratchet-section, mounted in said frame, a belt or cable engaging said wheel and attached at its ends to said carriage, a walking-beam carrying a pawl engaging said ratchet-section, a shaft provided with an arm connected to said walking-beam, a swinging frame mounted on said shaft, a spring connecting said shaft-arm and swinging frame, a series of rock-shafts connected to said swinging frame, and depressible key-levers mounted on said rock-shafts, substantially as described.

4. A type-writing machine, comprising a suitable frame, a traveling carriage thereon, a wheel having a ratchet-section, mounted in the frame, a belt or cable engaging said wheel and attached at its ends to said carriage, a walking-beam carrying a pawl engaging said ratchet-section, a shaft provided with an arm connected to said walking-beam, a swinging frame mounted on said shaft, a spring connecting said shaft-arm and swinging frame, a key-shaft connected to said swinging frame, a depressible key-lever mounted thereon, a type-lever pivotally linked to said key-lever, and a stop-pin below the arm of said shaft, substantially as described.

5. A type-writing machine, comprising a suitable frame, a carriage thereon, a pair of reels, a ribbon connecting the same and arranged adjacent to and below the platen-surface of the carriage, a shaft suitably journaled and adapted to operate one of said reels and wind the ribbon thereon, an arm projecting from said shaft, a swinging frame upon said shaft, a spring connecting said arm and said frame, a key-shaft suitably journaled, and connected to said swinging frame, a key-lever upon said shaft, a type-lever suitably mounted and linked to said key-lever, and a stop-pin below the arm of said shaft, so as to limit its movement and thereby arrest the movement of the ribbon before the type comes in contact with it, substantially as described.

6. A type-writing machine, comprising a suitable framework, a carriage thereon, a pair of reels, a ribbon connecting them and suitably guided adjacent to the platen-surface of the carriage, a ratchet-wheel upon the shaft of one of said reels, a shaft suitably journaled, a



dog carried thereby and engaging said ratchet-wheel, an arm projecting from said shaft, a swinging frame upon said shaft, a retractile spring connecting said arm and said frame, a key-shaft connected to said frame, a key-lever mounted upon said shaft, a type-lever suitably mounted and linked to said key-lever, and a stop-pin to limit the movement of the arm of the shaft connected to said swinging frame, substantially as described.

7. A type-writing machine, comprising a suitable framework, a traveling carriage thereon, a wheel mounted in the frame, and provided with a ratchet-section, a belt or cable engaging said wheel and attached at its opposite ends to said carriage, a pair of reels mounted in the frame, a ribbon connecting the same and guided adjacent to the platen-surface of the carriage, a walking-beam, a pawl mounted thereon and engaging said ratchet-section, a shaft adapted to impart motion to one of said reels and wind the ribbon thereon, an arm projecting from said shaft, a link connecting said arm with the walking-beam, a swinging frame mounted upon said shaft, a retractile spring connecting the same with the arm of said shaft, a key-shaft connected to said swinging frame, a key-lever mounted upon said shaft, a type-lever suitably mounted and linked to said key-lever, and a stop-pin arranged to limit the movement of said shaft-arm, and consequently arrest the carriage and the ribbon before the type comes in contact with the latter, substantially as described.

8. A type-writing machine, comprising a suitable framework, a traveling carriage thereon, a wheel mounted in the frame and provided with a ratchet-section, a belt or cable engaging said wheel and attached at its opposite ends to said carriage, a pair of reels mounted in the frame, a ribbon connecting the same and guided adjacent to the platen-surface of the carriage, a walking-beam, a pawl mounted thereon and engaging said ratchet-section, a shaft adapted to impart motion to one of said reels and wind the ribbon thereon, an arm projecting from said shaft, a link connecting said arm with the walking-beam, a swinging frame mounted upon said shaft, a retractile spring connecting the same with the arm of said shaft, a key-shaft connected to said swinging frame, a key-lever mounted upon said shaft, a type-lever suitably mounted and linked to said key-lever, a stop-pin arranged to limit the movement of said shaft-arm, and consequently arrest the carriage and the ribbon before the type comes in contact with the latter, means to return the wheel and carriage back to their original positions, and a spring to reelevate said walking-beam and consequently rock the shaft which also operates the ribbon mechanism back to its original position and return the swinging frame also to its original position with the assistance of said retractile spring, substantially as described.

9. In a type-writing machine, a suitable framework, a carriage support and adjuster thereon, and provided with guide-rollers, a bar mounted slidingly on and between said guide-rollers, a carriage-frame having a hinged connection with said bar and resting also upon the framework, and means to shift the carriage support and adjuster back and forth, substantially as and for the purpose described.

10. In a type-writing machine, a suitable framework, a carriage support and adjuster mounted thereon, and provided with flanged guide-rollers, a rectangular bar mounted slidingly on and between said guide-rollers, a carriage-frame having a roller bearing at its front side on the framework, and a hinged connection with the said rectangular bar, and means to move the carriage longitudinally or pivotally with respect to the support and adjuster, and means to move the latter back and forth substantially as described.

11. In a type-writing machine, the combination with a suitable frame, a bracket thereon, and a carriage, of a rotatable cylinder upon said carriage, a cam-wheel mounted to rotate with said cylinder and provided with a plurality of spiral flanges or ribs, a sliding bar mounted in the carriage, and a dog carried thereby and adapted under the impact of the bar against the bracket to engage one of said spiral flanges or ribs and rotatably operate said cam-wheel and said cylinder or feed-roller, substantially as described.

12. In a type-writing machine, the combination of a suitable frame, a carriage mounted thereon, a rotatable cylinder or feed-roller journaled in said carriage, a cam-wheel mounted to rotate with said cylinder and provided with a plurality of flanges or ribs, a sliding bar mounted upon the carriage, a spring holding the bar normally withdrawn, a dog carried by said bar, and a bracket mounted upon the machine-frame against which said bar strikes as the carriage returns to its initial position; and thereby causes the dog to engage and rotate the cam-wheel and cylinder and feed the paper for the printing of a new line, substantially as described.

13. In a type-writing machine, the combination with a suitable framework, and a bracket on the same, of a traveling carriage also on said framework, a rotatable cylinder thereon, a cam-wheel mounted to rotate with said cylinder, and provided with a plurality of flanges, a retracted sliding bar on said carriage, a dog carried thereby, a spring holding said dog at the limit of its movement in one direction, and means to return the carriage to its starting-point and cause said bar to strike against and be advanced by said bracket, and thereby rotate said cam-wheel and cylinder, substantially as described.

14. In a type-writing machine, a suitable frame, a traveling carriage thereon, a rotatable cylinder or feed-roller journaled therein, a cam-wheel mounted to rotate with said cyl-



inder or feed-roller and provided with a plurality of flanges or ribs, a retracted sliding bar in said carriage, a dog carried thereby, a spring holding said dog at the limit of its movement in one direction, a bracket upon the machine-frame in the path of said bar, means to return the carriage to its starting-point and cause said bar to strike against and be advanced by said bracket, and thereby rotate said cam-wheel and cylinder, and a spring to return or withdraw said sliding bar

to its original position after the carriage begins again its forward movement, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

FREDERICK F. ANDERSON.  
THEODORE KRAUSS.

Witnesses:

W. A. MACK,  
J. W. HAMBRICK.