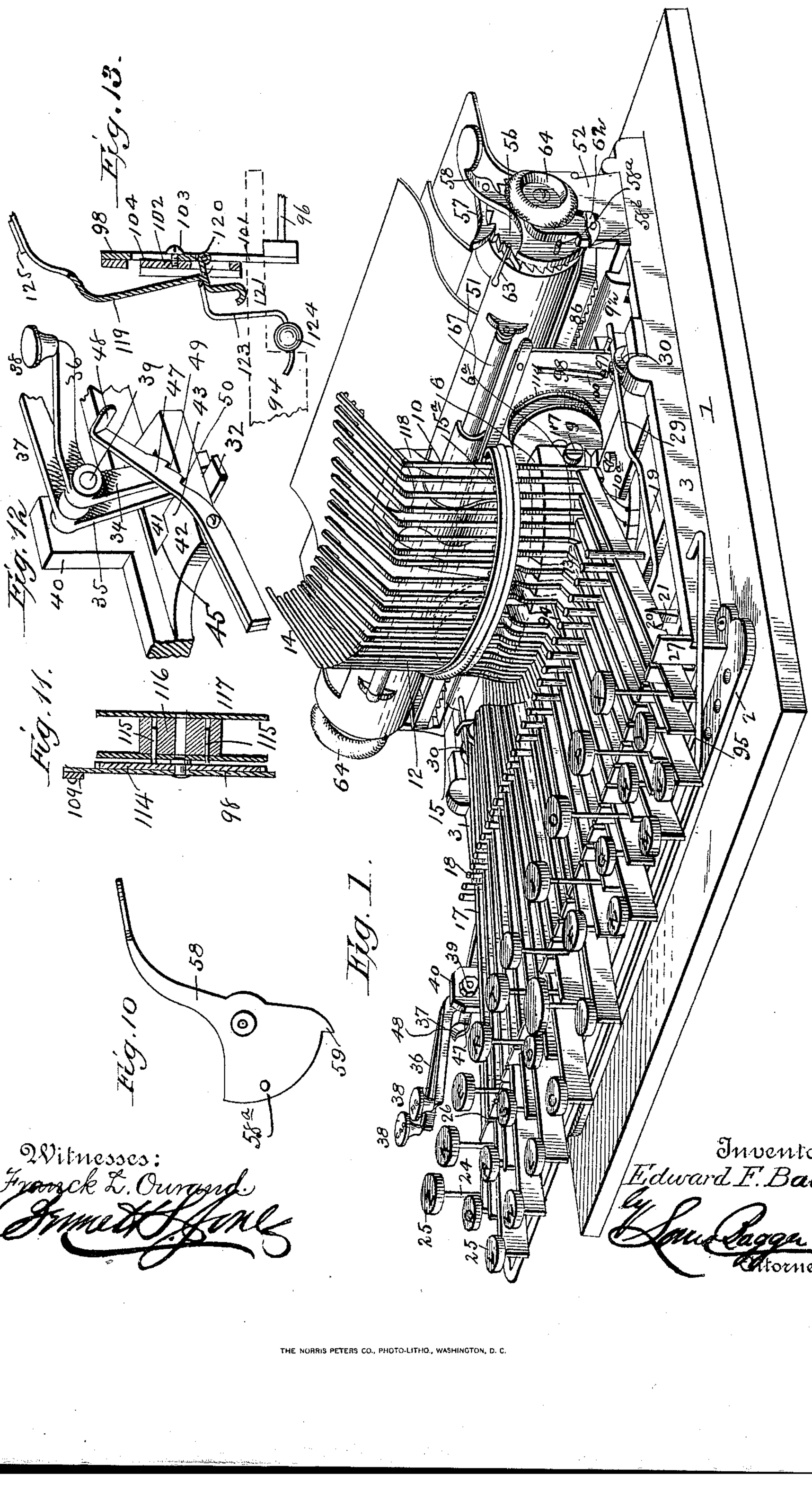
No. 640,172. Patented Jan. 2, 1900.

E. F. BAUM.

TYPE WRITING MACHINE.

(Application filed Oct. 18, 1897.)

(No Model.) 4 Sheets--Sheet 1



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E. F. BAUM.

TYPE WRITING MACHINE.

(Application filed Oct. 18, 1897.)

(No Model.) 4 Sheets—Sheet 2.

Fig. 1.

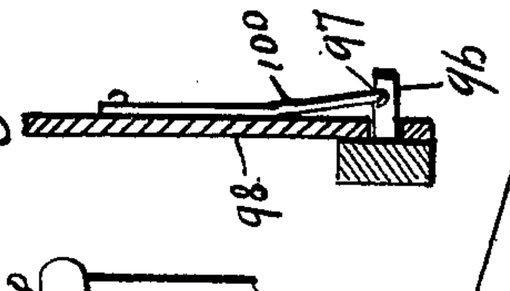

Fig. 7.

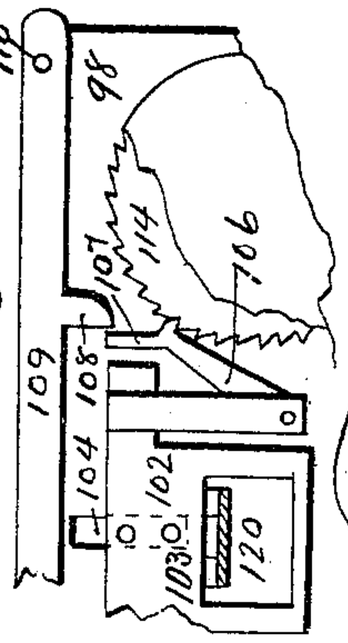

Fig. 6

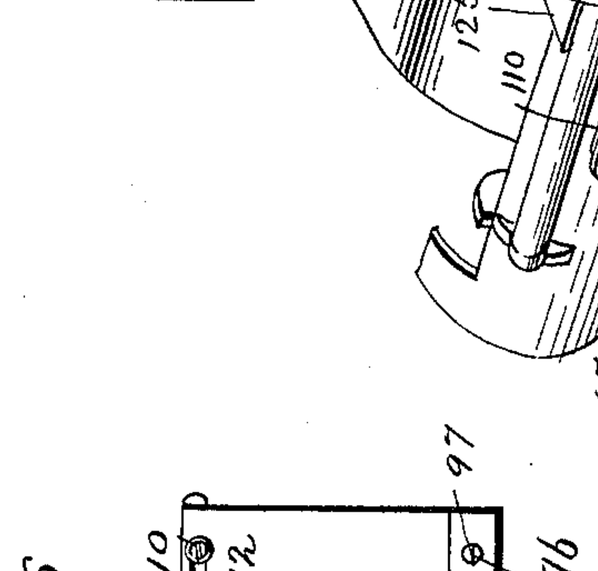

Fig. 9.

Fig. 2.

Witnesses:
Frayck L. Ozzard.
Emmett L. Ford

Inventor:
Edward F. Baum,
by Louis Bagger & Co.
Attorneys

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(No Model.) 4 Sheets—Sheet 3.

Fig. 3

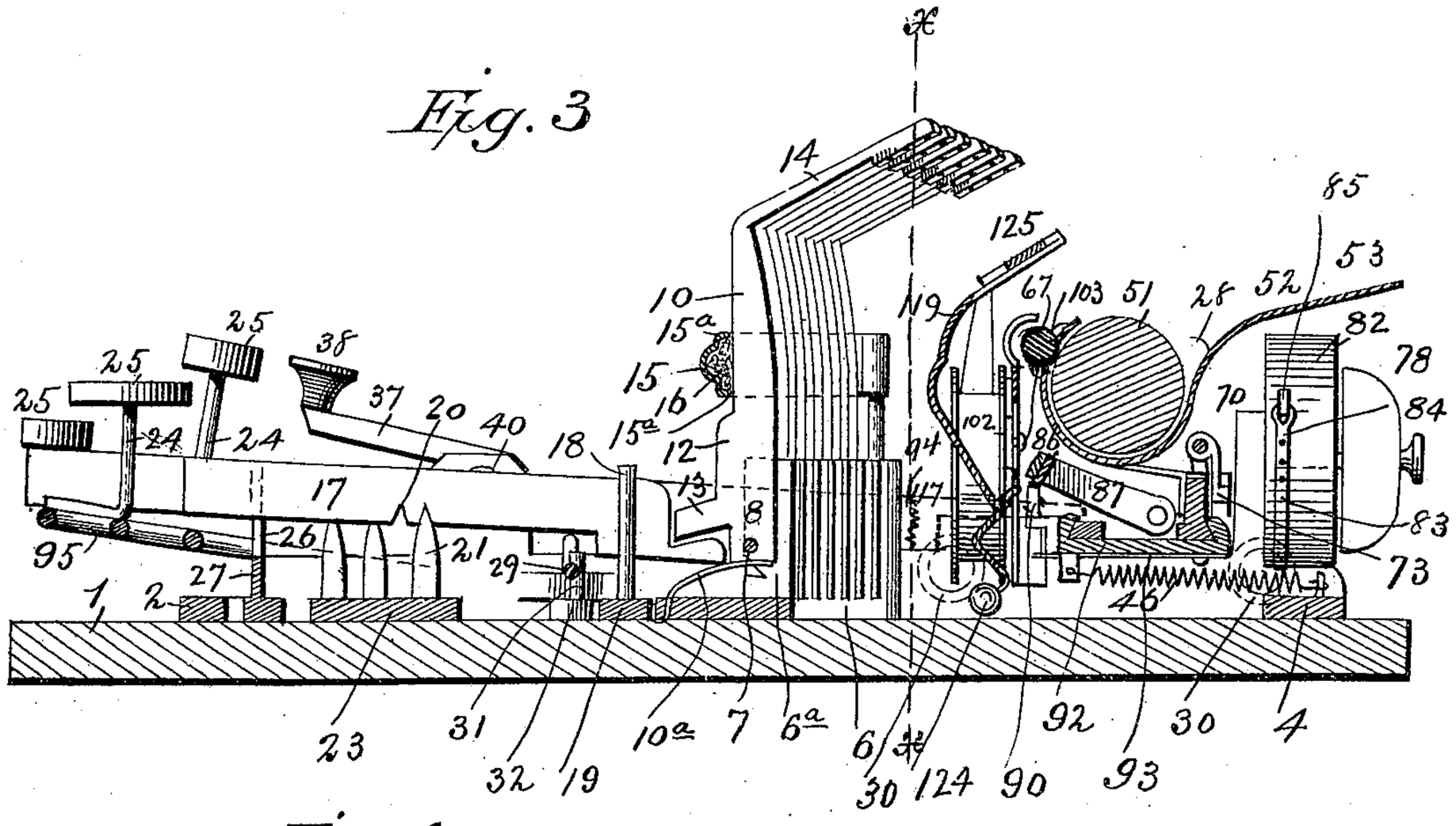


Fig. 4.

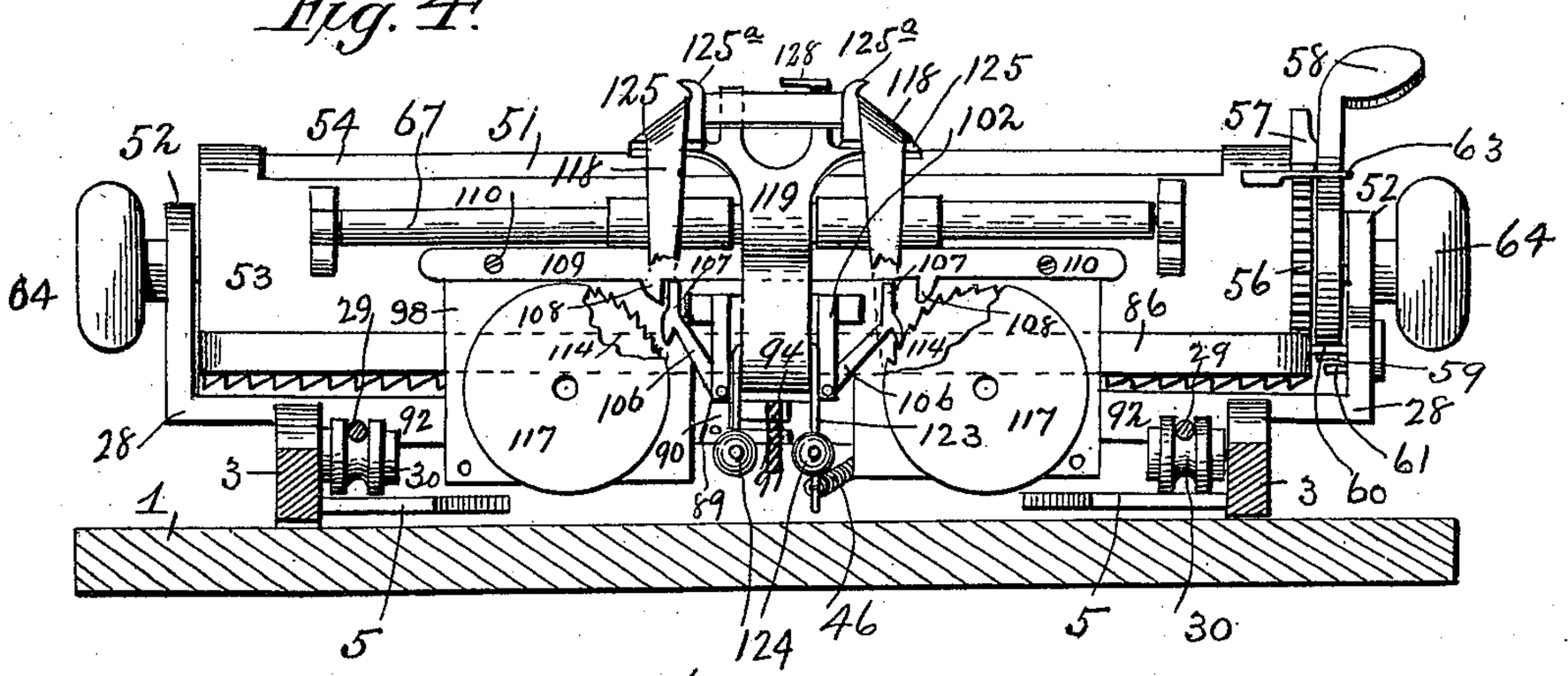
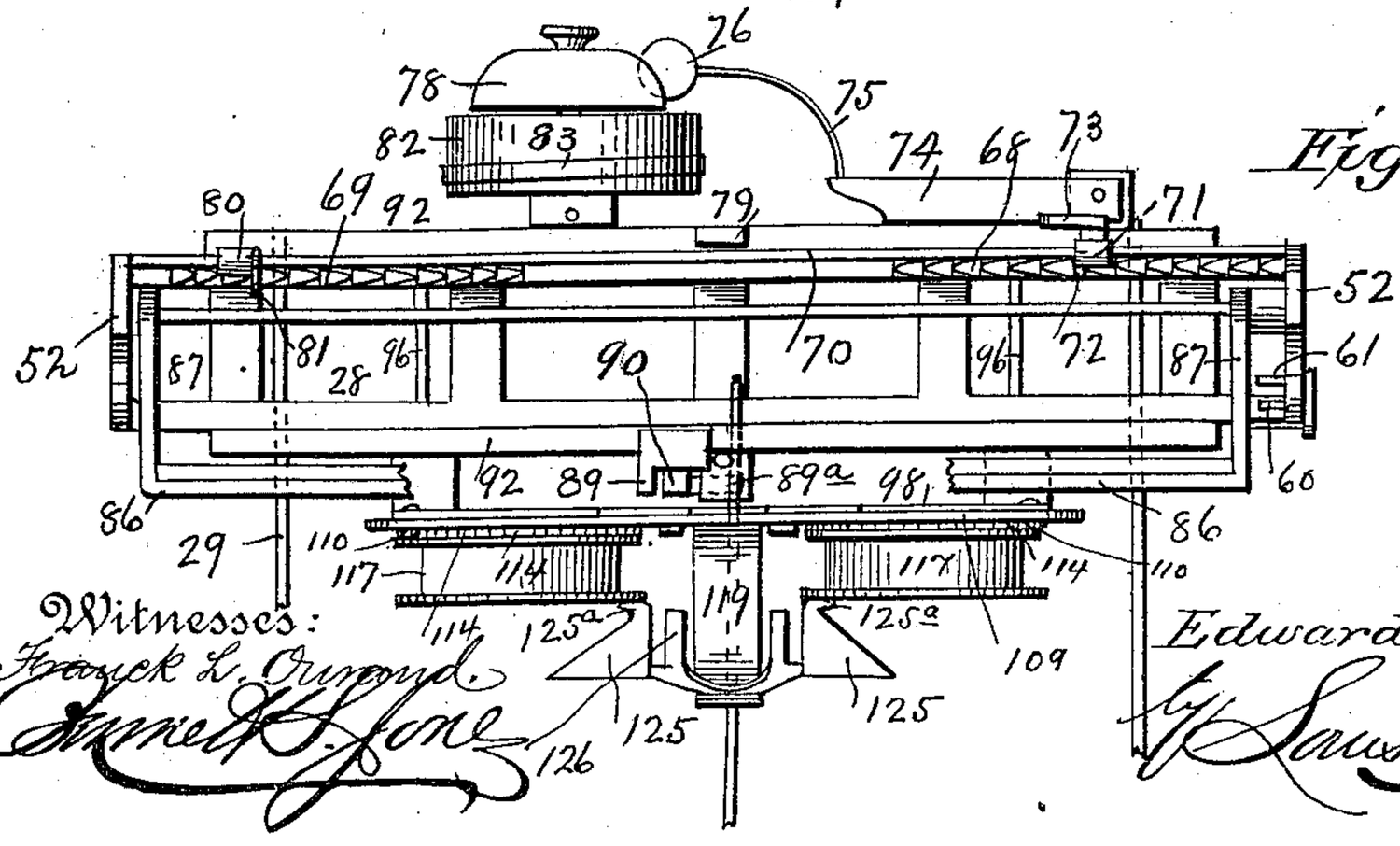


Fig. 5



Witnesses:
Franck L. Durand.
Emmett L. Jones

Inventor:
Edward F. Baum,
by Louis Bagger & Co.
Attorneys.

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E. F. BAUM.

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(Application filed Oct. 18, 1897.)

(No Model.) 4 Sheets—Sheet 4.

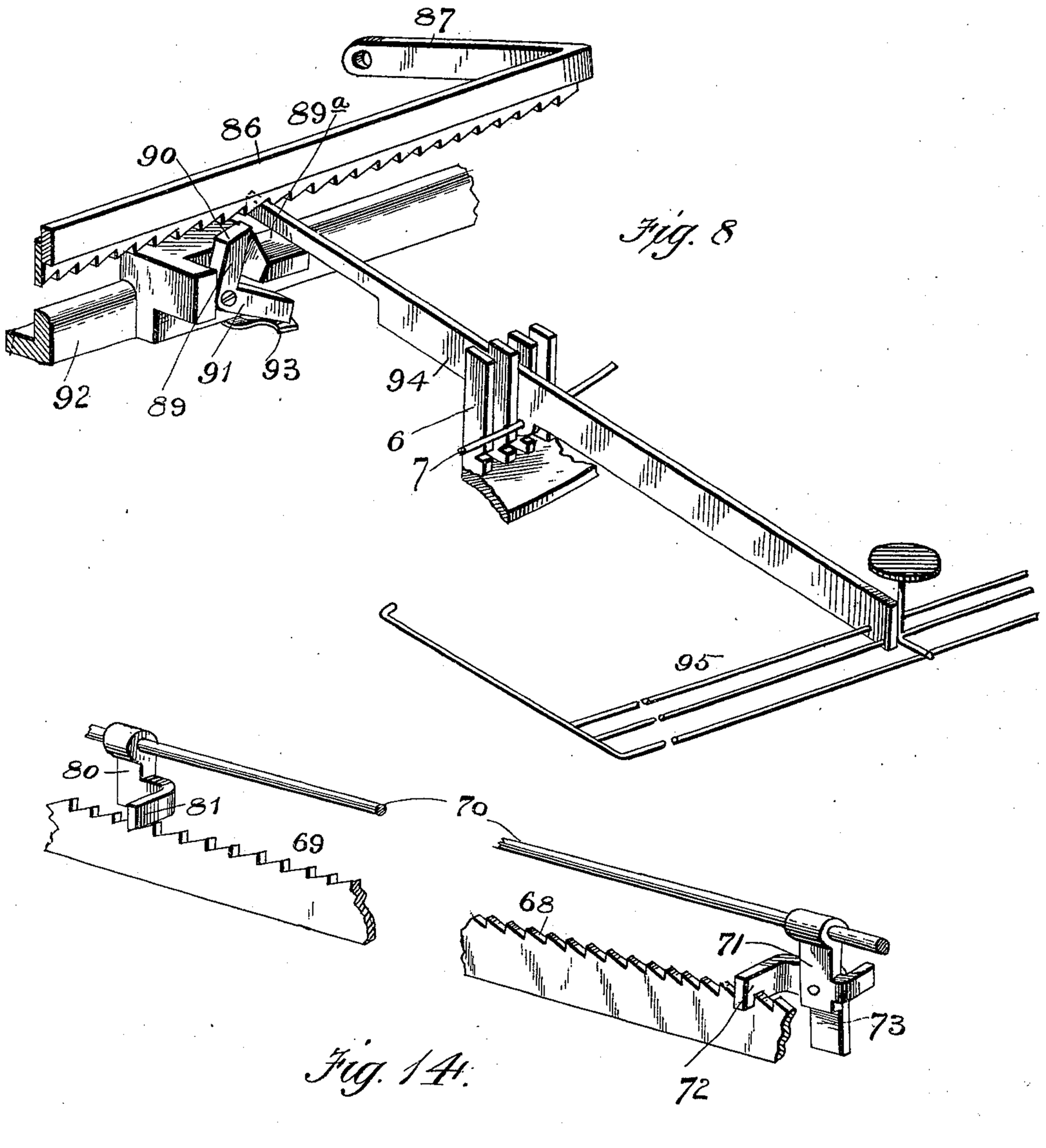

Fig. 8.

Fig. 14.

Witnesses:
F. L. Ourand.
Jos. L. Coombs

Inventor:
Edward F. Baum,
by Louis Bagger & Co.,
Attorneys.

UNITED STATES PATENT OFFICE.

EDWARD F. BAUM, OF HARRISBURG, PENNSYLVANIA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 640,172, dated January 2, 1900.

Application filed October 18, 1897. Serial No. 655,576. (No model.)

To all whom it may concern:

Be it known that I, EDWARD F. BAUM, a citizen of the United States, and a resident of Harrisburg, in the county of Dauphin and State of Pennsylvania, 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 of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to type-writing machines of that class or description for which I made application for Letters Patent on the 17th day of May, 1897, Serial No. 636,862, and in which the type-bars project up above the paper-carriage and the impression is made by a downward movement of the type when the key is depressed.

The object of the invention is to provide a machine of the above character which shall possess superior advantages with respect to efficiency in use; and it consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a type-writing machine constructed in accordance with my invention. Fig. 2 is a perspective view of the same, the type and key bars being removed. Fig. 3 is a central longitudinal section. Fig. 4 is a cross-section on the line *x x*, Fig. 3. Fig. 5 is a detail plan view. Fig. 6 is a detail view of the plate carrying the ribbon-spools. Fig. 7 is a detail view showing the slide and one of the dogs for operating the ribbon-spools. Fig. 8 is a detail perspective view of the spacer-dog and spacer-rack and the bar for elevating the latter. Fig. 9 is a detail view showing the means for ringing the bell. Fig. 10 is a view of the line-space lever. Fig. 11 is a sectional view of one of the ribbon-spools. Fig. 12 is a detail perspective view showing the means for changing from small letters to capitals or other characters. Fig. 13 is a central vertical section of the ribbon-holder and connections. Fig. 14 is a detail perspective view showing the carriage-stop mechanism. Fig. 15 is a detail sectional view of the plate which carries the slide by which the ribbon-spools are operated, showing the means for holding said plate in place.

In the said drawings the reference-numeral 1 designates the base of the machine, upon which is mounted the frame carrying the working parts. This frame comprises the front plate 2, side rails 3, rear cross-bar 4, and inwardly-extending lugs 5, to which is secured the segment 6, with which the type-bars, hereinafter described, are pivotally connected. This segment is formed with a number of slots 6^a, one for each type-bar, and one also in the center for the passage of the space-bar, by which the feed of the paper-carriage is effected. Formed in the front side of said segment, near the lower end, is a groove 7, in which is seated a wire 8, held in place by screws 9 at each end. This wire passes through a hole in each of the type-bars and forms the fulcrum or journal for the same.

The numeral 10 designates the type-bars, comprising the vertical portions 12, formed with forwardly-extending lugs 13, near the lower ends, and the upwardly and rearwardly inclined portions 14, provided at the ends with two or more type, (three being shown in the present instance,) as is usual in this class of machines. These portions are bent at such an angle to the vertical portions 12 that when said type-bars are operated the type at the end thereof will strike at a common point, as is well understood, provision being made, as hereinafter described, for shifting the paper-carriage forward for bringing the other type on the type-bar into operative position when required. The numeral 15 designates a curved bar secured to the said segment and provided with a lining of felt 16 or other suitable material on the inner side, forming a buffer or cushion for the type-bars on their return movement after having been depressed. This bar or plate is provided at the upper and lower edges with inwardly-turned fingers 15^a, which engage with the edges of the felt and hold it in place.

The numeral 10^a designates springs for returning the type-bars to normal position after being actuated.

The numeral 17 designates the key-bars, one for each type-bar, passing between guide-pins 18, secured to a cross-bar 19. These key-bars are formed with beveled notches 20

in their under sides, which engage with upwardly-extending beveled pins 21, which form the fulcra for the bars. These pins are secured to a plate 23, secured to the side rails 3 of the machine-frame, and they are arranged in concentric segmental rows, the number of which rows correspond with the number of banks of keys, and there being three banks of keys in the present case there will consequently be three of such rows. The said key-bars, at the front ends, are provided with vertical pins 24, provided with keys or buttons 25, each having characters thereon corresponding with the type or characters of the type-bar operated thereby. Said key-bars, near the front ends, pass through guide-slots 26 in a transverse plate 27.

The numeral 28 designates the paper-carriage, provided with a forwardly-extending bail 29, which travels on grooved rollers 30, journaled to the side rails. A pin 31 on the inner end of a pivoted arm 32 engages with the front or transverse portion of the bail to move the same forward when operated. Against the outer end of this arm bear the lower arms 34 and 35 of two elbow-levers 36 and 37, the other arms of which are provided with buttons or disks 38. These levers are journaled to a stud-shaft 39, carried by a post 40, and the portion or arms project through an opening 41 in a plate 42, secured to one of the side rails 3. This plate is formed with an offset 43, which forms a stop for the arm 34 of lever 36, while the end of the opening at 45 forms a stop for the end 35 of the other lever 37. It will thus be seen that lever 37, marked "Fig.," can travel twice as far as the other lever 36, marked "Cap." When lever 36 is depressed, it will move the paper-carriage forward, so that the second type on the type-bars will be brought into operative position to change from small letters to capitals, while by depressing lever 37 the third type will be brought into operation to change the figures, punctuation-marks, and other characters, as is well understood. A coiled spring 46 returns the paper-carriage to normal position when said keys are released. For the purpose of holding said keys when depressed I provide the following means: Pivoted to the plate 42 is a lever 47, weighted at the rear end and at the front end bent to form a finger-hold 48. Upon the under side this lever is formed with two notches 49 and 50, which are adapted to engage, respectively, with the outer end of the pivoted arm 32 when depressed. This lever and the notches are so arranged that when either of said keys is depressed the end of the arm 32 will travel slightly beyond the notch with which it is to be engaged, and will fly back to engage with the notch when the lever is depressed, so as to hold said arm in place. This movement of the arm with respect to the notches is very slight, being inappreciable, in fact, and only sufficient to allow the arm to engage with the notch. To release the lever, it is only necessary to slightly depress the key which has operated the said arm, when the pressure of the latter against the vertical portion of the notch will be relieved and allow said arm and the paper-carriage to be returned to normal position by the coiled spring.

The numeral 51 designates the paper-roll, journaled to brackets 52 of the paper-carriage, and 53 the paper-apron, extending almost entirely around the paper-roll and formed with a longitudinal recess 54 in the upper side. Secured to one end of said paper-roll is a ratchet-wheel 56, with which engages a beveled pawl 57, pivotally connected with a counterbalanced line-spacer lever 58, journaled on one end of the paper-roll shaft. This lever is provided at its lower end with a lug 59, adapted to strike a fixed pin 60 on one of the brackets 52 or a movable pin 61, carried by an arm 62, pivoted to the outer side of said bracket, as the case may be. The pin 61 projects through a slot or opening in said bracket, and by moving said pivoted arm it may be thrown into the path of the lug 59. The object of this construction is to change the line-spacing. When the pin 61 is thrown out of line with the lug 59 by actuating the lever 58, the pawl 57 will engage with the ratchet-wheel 56 and rotate the paper-roll to bring a new line into position for the type, the pin 60 limiting the movement of said lever. To vary the distance between the lines, the arm 62 is turned so that the lug 59 will strike pin 61, whereby its movement is limited and the paper-roll be moved only half the distance. Secured to the end of the paper-apron is a pin 63, with which the pawl is adapted to engage, as hereinafter described. The paper-roll shaft, at each end, is provided with a turning-wheel 64, by which it may be rotated to insert a sheet of paper. The lever 58 is also provided with a pin 58^a, which is adapted to strike a shoulder 58^b of one of the brackets 52 when the paper-roll is moved backward and limit the movement of said lever. To turn the paper-roll backward or in a reverse direction to that in which it is turned to insert the paper, the roll is turned by the wheels 64, and the pawl engaging with the ratchet will carry or turn the lever 58 backward or in the direction of the pin 63. When the beveled end of the pawl strikes the pin 63, it will be thrown upward and out of engagement with the ratchet-wheel, thereby allowing the latter and the paper-roll to turn backward. At the same time the pin 58^a will come in contact with the shoulder 58^b, whereby the movement of the lever will be limited and the pawl be prevented from riding over the pin 63.

The numeral 67 designates the paper-feed roll.

The paper-carriage at the rear side is provided with a number of oppositely-disposed rack-teeth 68 and 69 at the ends thereof. Slidable on a transverse rod 70 is a rotatable dog 71, provided with a lip 72, which is adapted to engage with the teeth 68 and hold

the dog in any position to which it may be adjusted. Pivoted to this dog is an arm 73, adapted to engage with a spring 74, provided with a hammer-rod 75 and hammer 76. As the paper-carriage is fed forward the arm 73 will depress the spring 74 until the carriage is near the end of its movement, when it will ride off of the spring and the latter, by its resiliency, will spring upward and the hammer will strike a bell-gong 78. Upon the return movement of the carriage the arm will ride up on the spring. Said dog as the carriage is fed forward will come in contact with a stop 79, which limits the movement of the carriage. The dog 73 as the carriage moves forward or toward the left of the machine will be locked against movement; but on the return movement of the carriage the dog will be tripped to allow it to ride over the spring. Also journaled on said rod 70 is a dog 80, provided with a lip 81, adapted to engage with the teeth 69. The object of the dog is to limit the backward movement of the paper-carriage by coming in contact with the stop 79, so as to regulate the width of the margin at the left of the paper.

The numeral 82 designates a spring-barrel of any ordinary or suitable construction provided with a strap 83, the free end of which is formed with a number of holes 84, with which is adapted to engage a hook 85, secured to the said barrel. The other end of the strap is secured to the paper-carriage. Should the spring of the barrel become weakened by engaging the hook with one of the other holes, such weakening may be compensated for.

The numeral 86 designates a spacer-rack provided at each end with an arm 87, pivoted to the brackets 52 at the ends of the paper-carriage. Engaging with the teeth of this rack is a pivoted spacer-dog 89. This dog is in the form of an angle-bar, comprising the vertical arm 90 and a horizontal arm 91, and is pivoted at its center to the front side of the track 92, upon which the paper-carriage travels. The upper end of said dog is beveled so as to engage with the teeth of the rack, while the opposite or lower end rests on the free end of a spring 93. A stop 89ª limits the forward movement of the dog 89. Also engaging with said teeth is a spacer-bar 94, fulcrumed on the curved rod 7. The front end of this bar is secured to a bail 95, pivoted to the side rails 3 and bearing against the under side of the key-bars. Secured to the track 92 are two rods 96, the front ends of which are formed with notches 97 and pass through a vertical plate 98. Springs 100, secured to said plate, engage with said notches to hold the plate in place. This plate is formed with a central opening or cut-away portion 101, in which is located a vertically-movable slide 102, provided with a headed guide-pin 103, working in a slot 104, above said cut-away portion. To the lower end of this slide are attached the inner ends of two curved springs 105, the upper ends of which are secured to the rear side of the plate 98. The tension of these springs serves to retain the spacer-bar 94 in normal position, which bar passes under the sliding plate 102, and is consequently forced downward when said plate is lowered. Pivoted to said slide at opposite sides and at the front thereof is a pawl 106 for operating the ribbon-spools. These pawls at their upper ends are formed with extensions 107, adapted to engage with lugs 108 on a laterally-movable shifting bar 109. This bar is provided with headed pins 110, working in slots 112 in the plate 98. Said pawls engage, respectively, with ratchet-wheels 114, pivoted to plate 98, each of which wheels is provided with two pins 115, which pass through the hubs 116 of ribbon-spools 117, which are held thereon by frictional contact. The numeral 118 designates the ink-ribbon secured to said spools. This ribbon passes through a vibrating holder 119, located in front of and pivoted to a lug 120 of the plate 98. The lower end of this holder is formed with a lug or arm 121, which rests on the spacer-bar, and is also provided with rods 123, provided with counterbalance-weights 124. The upper end of the holder is provided with beveled ribbon-guides 125, formed at the ends with hooks 125ª to hold the ribbon in place thereon. The holder is also provided with straight guides 126. The ribbon passes between said guides 125 and 126.

The numeral 127 designates two curved plates at the upper end of plate 98, one of which is formed with a pointer 128.

The operation is as follows: When a key-bar is depressed, it will strike the bail 95, connected with the front end of the spacer-bar 94, causing the rear end of the latter to be elevated and throwing the vibrating holder forward, so that the ribbon will be over the paper at the point where the type will strike. The said spacer-bar will also elevate the spacer-rack 86, raising it out of contact with the spacer-dog 89, which will fall by gravity until its horizontal arm comes in contact with spring 93, which limits its movement. The spacer-rack will now be held in such elevated position until the key is released and the spacer-bar allowed to fall. As said spacer-bar is elevated by the depression of the key the slide 102 will be elevated, carrying with it the pawls 106. At the same time the type-bar corresponding with the key depressed is actuated by the key-bar, so that the type will strike the ink-ribbon and make an impression on the paper. When the key is released, the type-bar will be returned to normal position by its spring and the vibrating holder will be thrown back away from the paper-roll. At the same time the slide 102 will be depressed by the spring 105 and in turn will depress the rear end of the spacer-bar, throwing it out of engagement with the rack-bar. The latter will now fall, and one of its teeth will engage with the vertical arm of the dog 89. The spring-barrel and connections will

now move the paper-carriage forward or toward the left of the machine, the dog turning on its pivot until its horizontal arm comes in contact with the stop 89ª, which will stop the movement of the carriage. By this means the paper-carriage is moved forward one tooth or step, as is usual in this class of machines. The spring 93 does not force the dog against the stop 89ª, but simply acts as a stop for the downward movement of the dog when the latter is disengaged from the spacer-bar by the depression of a key. When the carriage is moved backward or reversed — as, for instance, to begin a new line—the horizontal arm of the dog will depress the said spring, thus allowing the vertical portion of the dog to ride over the teeth of the spacer-bar. When the shifting bar 109 is moved to the right or left, as the case may be, to reverse the movement of the ribbon, one of the lugs 108 of said bar will engage with the extensions 107 of one of the pawls, and thus hold said pawl out of engagement with the ratchet-wheel of the ribbon-spool at that side of the machine. The other pawl, however, will not come in contact with the other lug 108 and will engage with and turn its ratchet-wheel and the ribbon-spool carried by the same, and thus cause the ribbon feed. The extensions of the pawls never fall below the lugs 108, as will be seen by reference to Fig. 7, which shows one of said extensions in its lowermost position. By shifting the shifter-bar the operation will be reversed and the ribbon be fed in the opposite direction. The downward movement of the slide 102, caused by the springs 105, will return the space-bar to normal position.

Having thus fully described my invention, what I claim is—

1. In a type-writing machine, the combination with the series of type-bars pivoted below the platen, comprising the vertical portions extending above the platen, the upper ends of which are bent rearwardly and upwardly, forming extensions parallel to each other and bent at such an angle with respect to the vertical portions as to strike and print at a common point, substantially as described.

2. In a type-writing machine, the combination with the frame, and the slotted segment and the fulcrum-wire secured thereto, of the type-bars pivoted to said fulcrum-wire consisting of the vertical portion having a lug near the lower end and the upper portion bent laterally inward and then extending upwardly and rearwardly and provided with printing characters on the under side, the key-bars adapted to engage with said lugs when depressed, and the flat springs bearing against the lower ends of the type-bars, substantially as described.

3. In a type-writing machine of the character described, the combination with the frame and the type-bars, and means for actuating the same, of the horizontally-movable paper-carriage, the pivoted arm connected therewith, the elbow-levers, the slotted plate through which the lower ends of said levers project provided with an offset, substantially as described.

4. In a type-writing machine of the character specified, the combination with the frame and the type-bars, and means for actuating the same, of the horizontally-movable paper-carriage, the pivoted arm connected therewith, the elbow-levers, the slotted plate through which the lower ends of said levers project, provided with an offset, and the counterbalance-lever having notches in its lower edge, adapted to engage with the outer end of said pivoted arm, substantially as described.

5. In a type-writing machine of the character described, the combination with the frame, and the type-bars and means for actuating the same, of the horizontally-movable paper-carriage, the forwardly-extending bail secured thereto, the grooved wheels on which the horizontal portions of said bail work, the pivoted arm provided with a pin engaging with said bail and the elbow-lever for operating said arm, substantially as specified.

6. In a type-writing machine of the character described, the combination with the frame, and the type-bars and means for actuating the same, of the horizontally-movable paper-carriage, the forwardly-extending bail secured thereto, the grooved wheels upon which said bail works, the pivoted arm having a pin engaging with said bail, the slotted plate formed with an offset, the elbow-levers and the counterbalance-lever having notches in its lower edge adapted to engage with the outer end of said pivoted arm, substantially as specified.

7. In a type-writing machine, the combination with the paper-carriage, the paper-roll, its shaft and the ratchet-wheel, of the counterbalanced line-space lever journaled on said shaft, the pivoted pawl, the lug at the lower end of said lever, the bracket formed with a slot, the fixed pin, the pivoted arm provided with a pin projecting through said slot, substantially as described.

8. In a type-writing machine, the combination with the paper-roll, its shaft, the ratchet-wheel, the paper-apron and the pin at one end thereof, of the counterbalanced line-space lever, the pivoted pawl having a beveled end, the lug at the lower end of said lever, the bracket having a slot therein, the pivoted arm having a pin projecting through said slot and the pin fixed to said bracket, substantially as described.

9. In a type-writing machine, the combination with the paper-carriage provided with ratchet-teeth and the stationary rod provided with a central fixed stop, of the rotatable and adjustable lug journaled on said rod and provided with an integral lip adapted to engage with said teeth, substantially as described.

10. In a type-writing machine, the combination with the paper-carriage, the oppositely-disposed ratchet-teeth at the ends there-

of, and the transverse rod, of the adjustable pivoted dog having a lip adapted to engage with the ratchet-teeth at one end, the adjustable pivoted dog having a lip adapted to engage with the other ratchet-teeth, the arm pivoted to last-mentioned dog, the spring, the hammer-rod, the hammer and the bell, and the stop on the carriage, substantially as described.

11. In a type-writing machine, the combination with the paper-carriage, the pivoted gravity spacer-rack, the pivoted angle-dog, one arm of which is formed with a beveled end adapted to engage with said spacer-rack, the spring with which the other arm of said dog is adapted to engage and the fixed stop, of the spacer-bar engaging with the teeth of said spacer-rack for elevating the same and holding the carriage against movement until the inner end of said spacer-bar is depressed, substantially as described.

12. In a type-writing machine, the combination with the paper-carriage, the pivoted gravity spacer-rack, the pivoted angle-dog, one arm of which is formed with a beveled end adapted to engage with said spacer-rack, the spring with which the other arm of said dog is adapted to engage and the fixed stop, of the pivoted spacer-bar engaging with said spacer-rack for elevating the same and holding the paper-carriage against movement until the inner end of said spacer-bar is depressed, the pivoted bail secured to said spacer-bar, and the key-bars located above the same and adapted to depress it and the spacer-bar, and throw the inner end of said bar into engagement with the spacer-rack and elevating the same, substantially as described.

13. In a type-writing machine, the combination with the frame and the paper-carriage, of the plate secured to said frame having a central opening, the slide, the springs secured to said plate and to the slide, the pivoted pawls having extensions at the free ends, the laterally-movable shifting bar provided with lugs, the ratchet-wheels with which said pawls are adapted to engage, and means for actuating the same, substantially as described.

14. In a type-writing machine, the combination with the frame, the paper-carriage and the plate secured to said frame having a central opening, of the slotted slide, the headed pin for securing it to said plate, the springs secured to said plate and slide, the pawls pivoted to said slide having extensions at the free ends, the laterally-movable shifting bar provided with lugs, the ratchet-wheels with which said pawls are adapted to engage provided with outwardly-extending pins, the ribbon-spools having holes with which said pins engage the spacer-bar and the spacer-rack with which said spacer-bar is adapted to engage, substantially as described.

15. In a type-writing machine, the combination with the frame, the paper-carriage and the plate secured to said frame having a central opening, of the vibrating ribbon-holder pivoted to said plate formed with a lug below its pivotal point, the rods and the weights, the spacer-bar and the pivoted spacer-rack with which said spacer-bar is adapted to engage, substantially as described.

16. In a type-writing machine, the combination with the frame, the paper-carriage and the plate secured to said frame having a central opening, of the vibrating holder pivoted to said plate having beveled and straight ribbon-guides at the upper end, and the beveled guides provided with hooks, the lug at the lower end of said holder, the rods, the weights, the spacer-bar and the pivoted spacer-rack with which said spacer-bar is adapted to engage, substantially as described.

17. In a type-writer, the combination with the frame, the paper-carriage, the pivoted spacer-rack and the plate secured to said frame having a central opening, of the slide, the springs secured thereto, the pawls having extensions at the free ends, the laterally-movable shifting bar provided with lugs, the ratchet-wheels, the ribbon-spools connected therewith, the vibrating ribbon-holder, the guides at the upper end thereof, the rods and weights, and the spacer-bar and means for operating the same, substantially as described.

18. In a type-writer, the combination with the frame, the plate secured thereto having a central opening, and the paper-carriage, of the vertically-movable slide and means for actuating the same, the pawls pivoted to said slide having extensions at the free ends, the laterally-movable shifting bar provided with lugs, the ribbon-spools and the ratchet-wheels connected therewith, substantially as described.

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

EDWARD F. BAUM.

Witnesses:
V. GRANT FORRER,
S. W. FLEMING.