

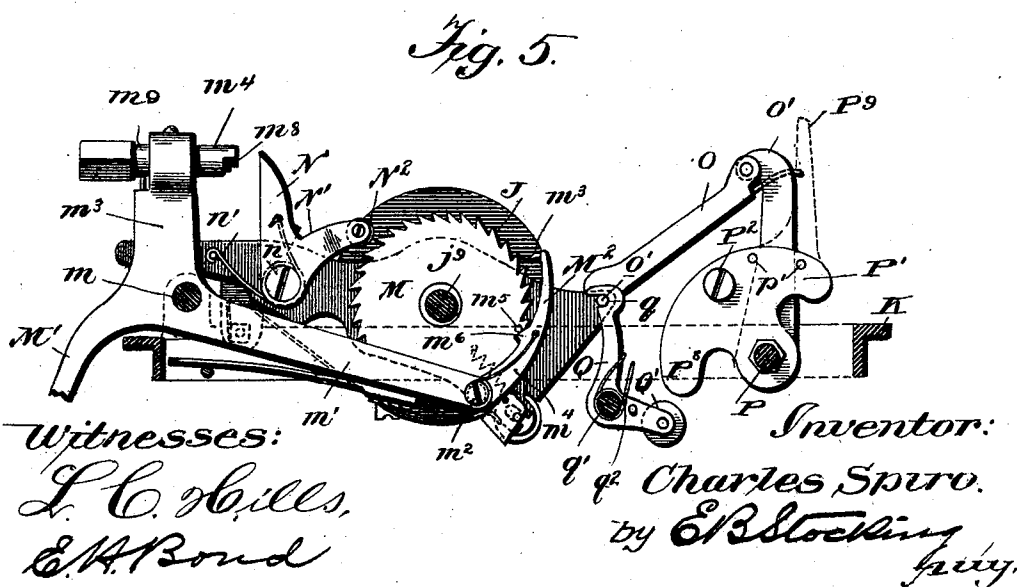
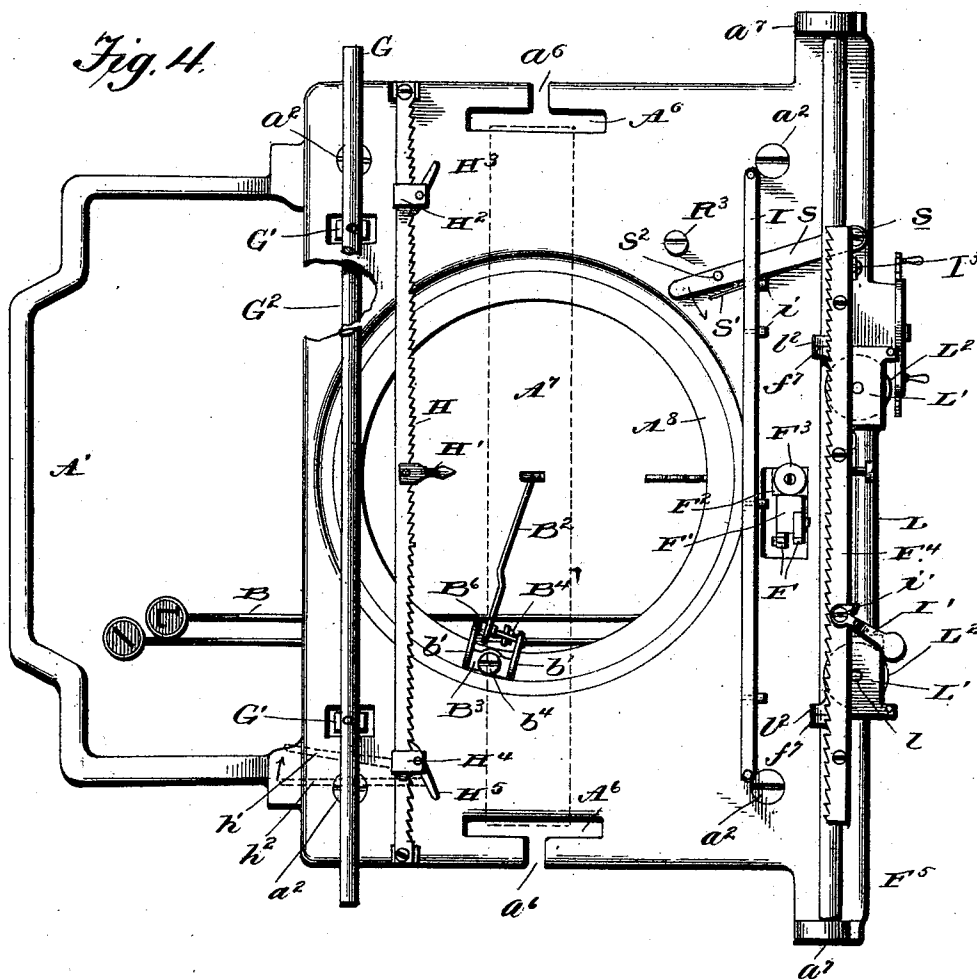
(No Model.)

6 Sheets—Sheet 2

C. SPIRO.
TYPE WRITING MACHINE.

No. 578,121.

Patented Mar. 2, 1897.



Witnesses: ^m
L. C. Hills,
E. A. Bond

Inventor:
Charles Spiro.
by E. B. Stocking
Att'y.

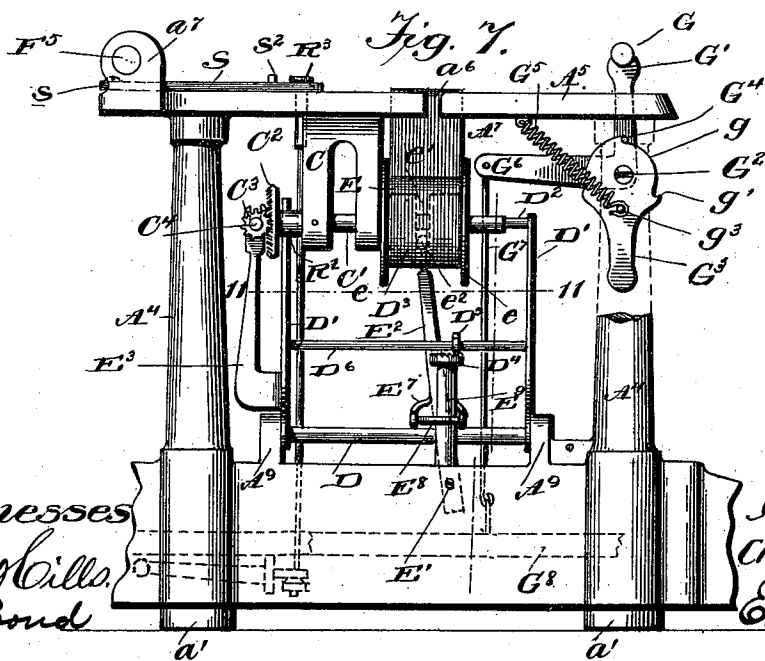
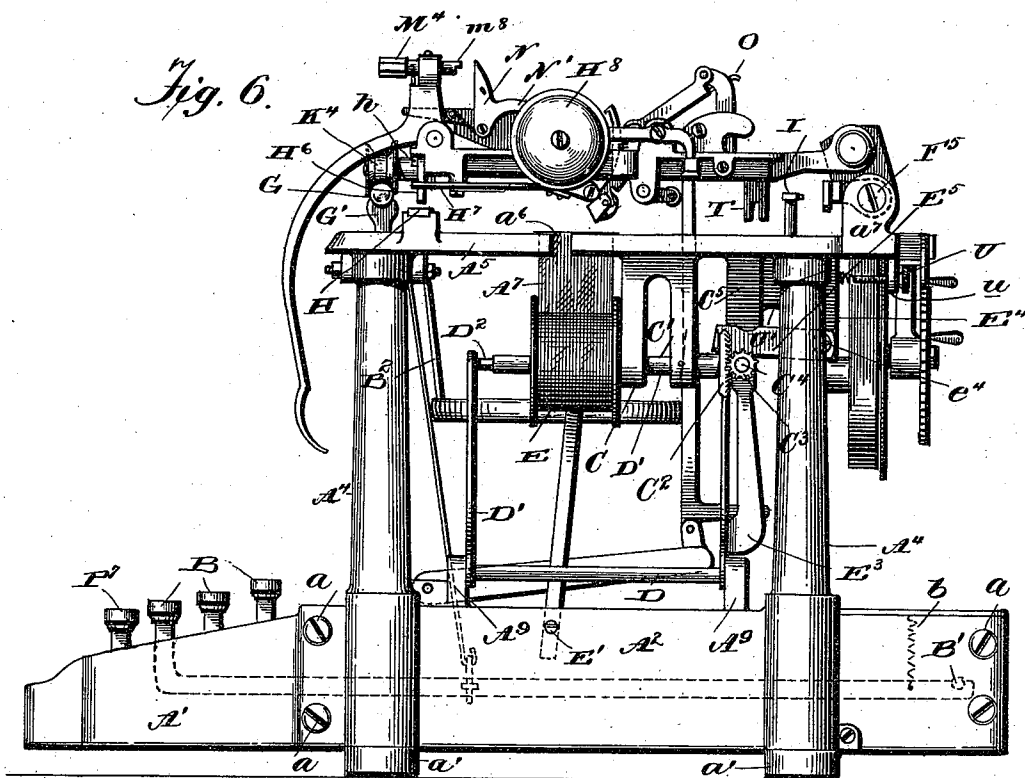
(No Model.)

6. Sheets—Sheet 3.

C. SPIRO.
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Witnesses
L. C. Hills.
E. A. Bond

Inventor:
Charles Spiro
by
E. B. Stocking
Atty.

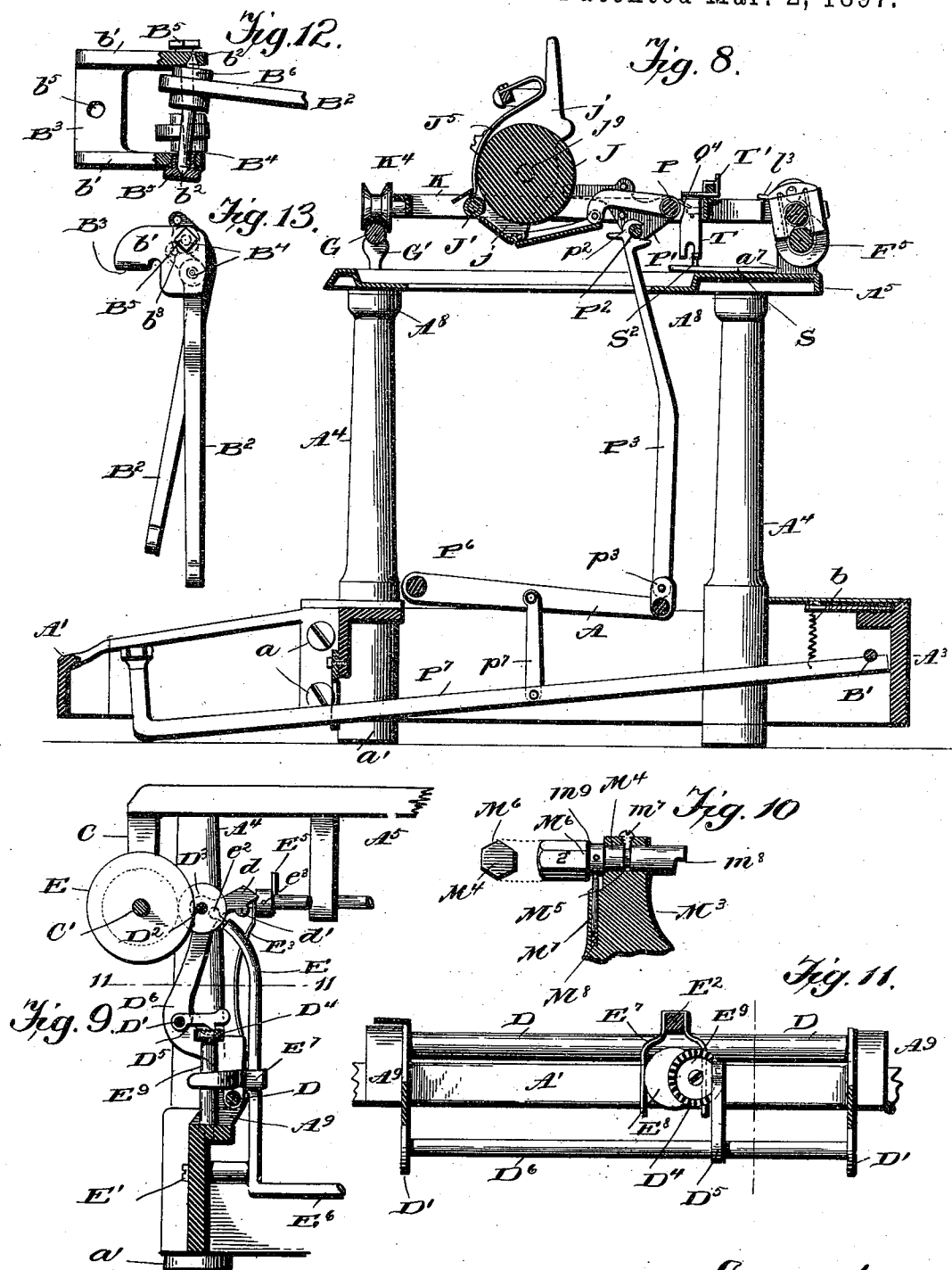
(No Model.)

6 Sheets—Sheet 4

C. SPIRO.
TYPE WRITING MACHINE.

No. 578,121.

Patented Mar. 2, 1897.



Witnesses:
L. C. Hills.
E. A. Bond

Inventor:
Charles Spiro.
by E. B. Stoddard
Atty.

(No Model.)

6 Sheets—Sheet 5.

C. SPIRO.
TYPE WRITING MACHINE.

No. 578,121.

Patented Mar. 2, 1897.

Fig. 14.

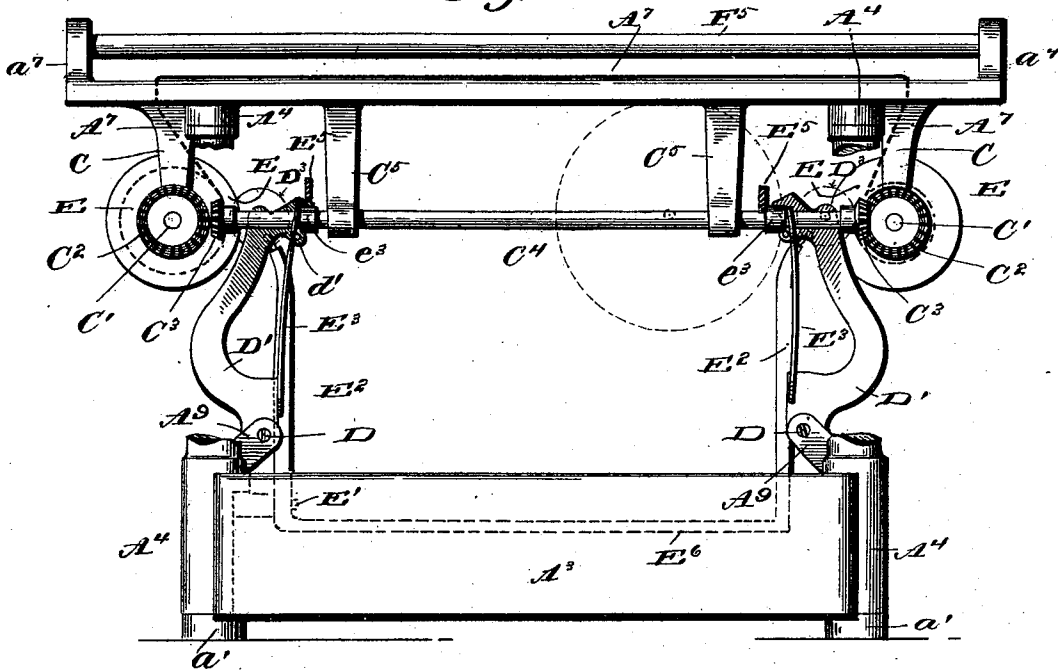
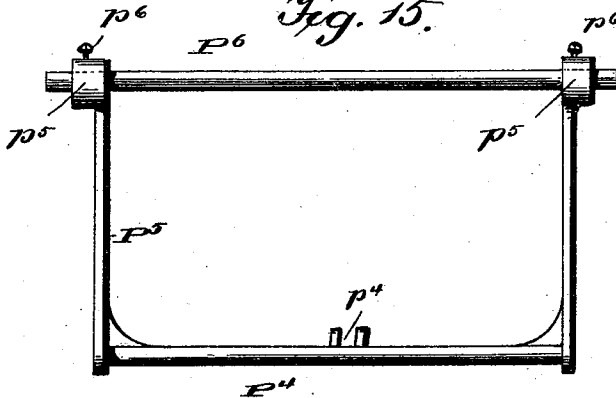


Fig. 15.



Witnesses:

L. C. Hills.
E. A. Bond

Inventor:

Charles Spiro.
by E. A. Bond
Atty.

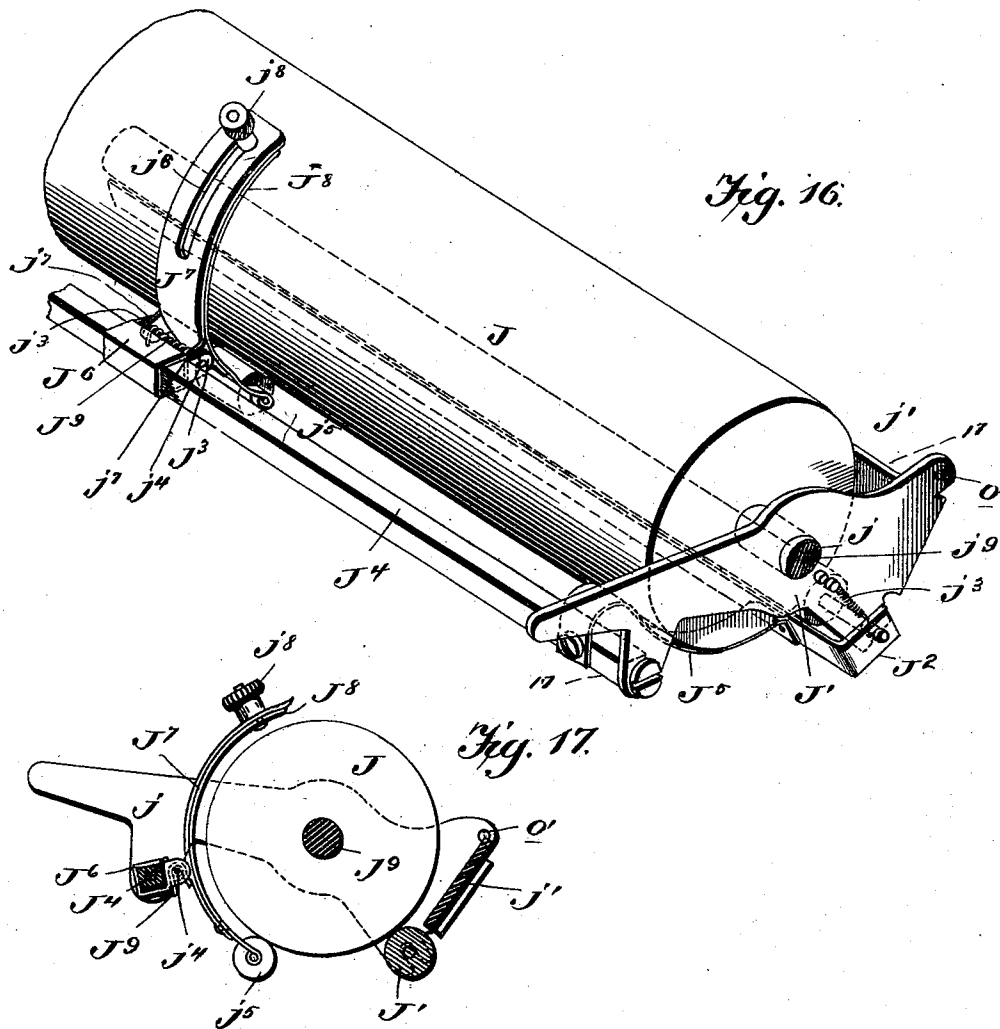
(No Model.)

6 Sheets—Sheet 6

C. SPIRO.
TYPE WRITING MACHINE.

No. 578,121.

Patented Mar. 2, 1897.



Witnesses:
L. C. Hills.
E. A. Bond

Inventor:
Charles Spiro.
by E. B. Storing
Atty.

UNITED STATES PATENT OFFICE.

CHARLES SPIRO, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 578,121, dated March 2, 1897.

Application filed June 29, 1895. Serial No. 554,474. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SPIRO, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to type-writing machines, having for its object, among others, to provide an improved machine of the Remington type which shall be simple in its construction, efficient in operation, durable, and
15 not liable to derangement or injury to any of the parts. I construct the frame in sections—that is, the front, back, and cap are made of separable parts—so that in case of breakage the frame is not lost, but can be readily repaired by replacing the broken part. I provide
20 a simple construction and mechanism for inverting or tilting the platen by means of a key, whereby the work may be readily inspected, the platen being mounted to automatically return to its normal position when
25 pressure upon the key is removed and to be automatically locked in such normal position. Novel mechanism is provided for thus locking the parts. The carriage is detachably
30 mounted for easy removal for cleaning. I dispense with a sliding frame for shifting from lower to upper case and in lieu thereof provide simple mechanism, the carriage having
35 pivotal connection with its roller-frame, whereby the latter is rocked upon its guide-rod as the carriage is shifted back and forth to change from upper to lower case, or vice versa. I provide an improved keyboard-lock
40 for preventing printing of letters one upon another after the end of a line or a predetermined point has been reached, the said lock being adjustable to vary the point of locking and the latter released by the carriage-shift
45 key. The platen and line-feed are removably mounted to permit of the substitution of others when desired. The line-feed pawl is mounted to be thrown out of mesh automatically to permit of back rotation of the platen, a roller abutment for the feed dogs or pawls
50 being provided. I further provide an improved simple and accurate paper-feed. Furthermore, I provide a more durable and sim-

ple hanger for the type-bars and provide for adjustment thereof in case of wear. The mechanism for the automatic reversal of the
55 ribbon and for an automatic lateral shift at each reversal thereof is of simple and novel construction. A simple means is provided for placing the parts in position for writing upper or lower case characters solely. The
60 tension for the keyboard is simplified and conveniently arranged. I have arranged for the easy removal of the ribbon-spools and for the placing of the ribbon in position.

I aim at various other improvements in details of construction and in the arrangement
65 of the parts, all of which will be more specifically called to attention as the description proceeds.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be particularly pointed out
70 in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part
75 of this specification, and in which—

Figure 1 is a top plan of my improved type-writing machine with parts broken away to better disclose other features. Fig. 2 is a vertical
80 cross-section on the line 2 2 of Fig. 1. Fig. 3 is an end elevation of the carriage, showing the manner of removably locking the platen in position. Fig. 4 is a plan with the carriage and other parts removed. Fig. 5 is
85 a vertical cross-section on the line 5 5 of Fig. 1 with portions broken away, the view being on an enlarged scale. Fig. 6 is an end elevation. Fig. 7 is an end elevation, looking at the opposite end of the machine, with the carriage removed and the parts broken away to
90 better disclose other features. Fig. 8 is a substantially central vertical section from front to rear with the type-bars and their connections removed. Fig. 9 is a vertical section on the line 9 9 of Fig. 7. Fig. 10 is a detail section of the line-space regulator. Fig. 11 is a
95 horizontal section on line 11 11 of Figs. 7 and 9. Fig. 12 is a detail in plan, with portions broken away and parts in section, showing the type-bar hanger. Fig. 13 is a side elevation of the same. Fig. 14 is a diagrammatic view, in rear elevation, with parts removed, portions
100 broken away, and parts in section, showing

the ribbon-reversing mechanism. Fig. 15 is a plan of the platen-tilting bail. Fig. 16 is an enlarged perspective view of a portion of the platen, showing the construction of the finger employed for holding the paper in place and guiding it as the platen is revolved. Fig. 17 is a cross-section on the line 17 17 of Fig. 16.

Like letters of reference indicate like parts throughout the several views.

Such elements of a type-writing machine as are not herein specifically described or referred to may be of any well-known or approved form of construction and mounted for operation in the usual manner. Only such parts are shown as are necessary to a proper understanding of the features constituting the present invention.

Referring now to the details of the drawings by letter, A designates the frame, which comprises the front A^1 , the body portion A^2 , and the rear portion A^3 , these three parts being cast or formed separately and nicely fitted together and detachably united in any suitable manner, as, for instance, by screws a , whereby when either part becomes broken or damaged to such an extent as to require its replacement by a new part the said part may be replaced without loss or discarding of the remainder of the frame. The body portion of this frame is formed with the standards or posts A^4 , adapted to receive suitable yielding pads or feet a' in the usual manner, and adapted also to support the top A^5 , which may be fixed thereon in any suitable manner, as, for instance, by screws a^2 , passed through the top and entering the upper ends of the posts. Such securing means are shown in Figs. 1 and 4. This top is formed at opposite ends with the slots A^6 , extending in the direction of the same from front to rear, said slots communicating with the open-ended slot a^6 , extending at right angles thereto, the said slots A^6 being for the reception and guidance of the ribbon A^7 , and the slots a^6 provide for the introduction of the ribbon into the slots A^6 by the placing of said ribbon parallel with the walls of the slots a^6 and then bringing it parallel with the walls of the slots A^6 , as will be readily understood from inspection of Fig. 4.

The key-levers B are of known construction and mounted in the usual manner, B' being the back transverse rod upon which they are pivoted, and b being the spring for returning them to their normal position after having been depressed to make an impression. The key-levers are connected with the type-bars in the usual manner, the type-bars being of any well-known or approved form of construction and carrying upper and lower case letters, as is usual in this class of machines.

In Figs. 12 and 13, B^2 are the type-bars, and B^3 their hangers. This hanger is struck up from sheet metal and comprises the base portion and the parallel side bars b' , in which are supported the journals for the type-bars.

These journals B^4 are arranged, as seen best in Fig. 12, at angles to each other, so that they practically cross, as indicated in said Fig. 12, the said journals of course being upon different vertical planes, as illustrated in Fig. 13, and each hanger supporting two journals and consequently two type-bars. The ends of the journals are cone-shaped, as seen at b^2 in Fig. 12, the one end being supported in a like bearing in one of the said bars b' of the hanger, while the other extends into and has a similar bearing in a nut B^5 , which nut is engaged in a screw-threaded opening in the side bar b' of the hanger, whereby ready adjustment for wear is provided. The type-bar is provided with a sleeve or boss B^6 , which receives the journal and upon which it is rigidly secured. The tail of the type-bar is perforated, as shown at b^3 , for the reception of the ligament which connects the same with the key-lever, as usual. The placing of the journals at different angles, as shown, provides for the accommodation of the two type-bars on the same hanger and economizes space. The nuts upon the ends of the journals are arranged at opposite ends, as shown, so as to be more readily accessible for adjustment when necessary. The hanger is secured in position upon the ring A^8 of the top A^5 by means of a screw b^4 , passed through an opening b^5 in the horizontal portion of the hanger, as seen best in Fig. 1.

I deem it expedient to next describe the ribbon-feed and the mechanism for causing the automatic reversal thereof at each end, as well as a lateral shift upon each automatic reversal, and for this purpose special attention is directed to Figs. 6, 7, 9, 11, and 14, in which the top A^5 is shown as provided at each end with the depending arms or lugs C, in which are journaled the spool-shafts C', as seen best in Figs. 6 and 7, and which spool-shafts carry at one end a beveled gear C^2 , adapted to mesh with the smaller beveled gears C^3 on the transverse shaft C^4 , arranged at the rear of the machine in suitable bearings or lugs C^5 , depending from the top A^5 of the machine, as seen best in Fig. 14, this latter shaft C^4 being designed to be moved lengthwise in its bearings by mechanism hereinafter described, the ribbon being designed to be fed along automatically at each depression of the key-lever in the usual manner.

The main portion of the frame is formed upon opposite sides thereof with the lugs A^9 , as seen best in Figs. 6, 7, and 14, in which lugs are journaled to rock the shafts D, one upon each side of the machine, as seen in Fig. 14, these shafts being designed to be held in the lugs in any suitable manner, as, for instance, by the screw shown in Fig. 14, although this is an unessential feature of the construction. Each of these shafts D carries uprights D', which in Figs. 9 and 14 are shown as curved, and their upper ends are connected by the shaft D², on each of which are mounted to slide lengthwise thereof the rollers D³, which are

adapted to lie between the heads or flanges e of the ribbon-spools E , as indicated by dotted lines in Fig. 7. These rollers are connected to move together and in the groove e' . Between said rollers is mounted to work the end or head e^2 of the arm E^2 , which is pivoted at its lower end, as shown at E' , to the base or frame of the machine, as seen in Figs. 6 and 7. These rollers are adapted to bear yieldingly against the ribbon wound upon the ribbon-spool, and as the ribbon accumulates thereon the said rollers and the rocking frame by which they are carried are gradually moved inward toward the center of the machine, as will be readily understood. Each of these rocking frames carries a spring-arm E^3 , (seen in Figs. 6, 7, 9, and 14,) the upper end of which is forked to embrace the shaft C^4 and adapted to engage a collar e^3 thereon, as seen best in Fig. 14. The side bar or upright of the rocking frame is provided with an extension d , as seen best in Fig. 9, from which projects a lateral pin d' , as seen in Figs. 9 and 14, against which the forked end of the spring-arm engages, as seen in Fig. 14. Projecting laterally from a depending lug E^4 on the top A^5 of the machine is a projection or screw e^4 , on which is pivotally mounted an arm E^5 , as seen in Figs. 6 and 14. This arm is adapted to rest upon the collars e^3 on the shaft C^4 alternately—that is, when the said arm on one side of the machine is riding upon its collar the arm upon the other side is engaging against the face of the collar upon the opposite side, as seen best in Fig. 14.

In operation, as the ribbon is wound upon the one spool and unwound from the other, as it accumulates upon the former the rollers D^3 of the spool which is receiving the ribbon will be gradually forced away therefrom, while the rollers upon the other side will gradually move outward as the ribbon on the said spool is unwound. Now as the rocking frame carrying said rollers is moved inward toward the center of the machine the tapered or beveled end of the extension d of one of the uprights of the rocking frame is gradually engaged under the free end of the arm E^5 and the latter is lifted from its engagement with the inner face of its collar e^3 , and in the continued movement of the rocking frame the said arm E^5 is moved up over the said collar, as indicated at the left of Fig. 14, in which view the ribbon-spool upon the left is receiving the ribbon and is nearly full, while from that upon the right the ribbon is being unwound. As seen in said Fig. 14, the ribbon has just been reversed, the shaft C^4 having been moved to the right so its beveled pinion would mesh with the beveled pinion C^3 on the shaft C' at the right of the machine in said Fig. 14. As soon as the arm E^5 is raised clear of the collar e^3 the spring-arm E^3 comes into play and forces the shaft C^4 endwise against the action of the spring E^3 at the opposite side of the machine, and should the pinion C^3 for any reason fail to immediately engage with

its pinion C^2 the continued movement of the rocking frame will cause its spring-arm E^3 to force the said pinion into engagement with its mate. It will of course be readily understood that the same operation occurs when the ribbon is unwound from the spool on the left and is wound upon that on the right in Fig. 14.

In order to provide an automatic lateral shift of the ribbon at each reversal thereof, as above described, so that the entire surface of the ribbon may be brought into operative position and thus its entire surface utilized, I have provided the means illustrated more fully in Figs. 6, 7, 9, and 11, to which special attention is now called. The arms E^2 , the upper ends of which engage in the grooves of the pressure-rollers D^3 , are connected by or formed integral with the connecting portion E^6 , as seen best in Figs. 9 and 14, and projecting laterally from one of these arms or uprights E^2 is the yoke E^7 , between the bifurcations of which is mounted to work a cam E^8 , (shown best in Fig. 7,) this cam being fast upon a shaft E^9 , vertically disposed and mounted for rotation in a suitable bearing on the frame. The upper end of this shaft is formed with or carries a ratchet-wheel D^4 , which, as seen in Figs. 7 and 9, is mounted to revolve in a horizontal plane, and with this ratchet engages a pawl D^5 , which is pivotally mounted upon a rod D^6 , which connects the uprights D' of the rocking frame at a point between their upper and lower ends, as seen best in Figs. 7 and 9. The operation of this part of the invention will be readily understood and is as follows:

At each reversal of the ribbon as it nears its end the rocking frame carrying the pressure-spools is moved sufficiently to cause the pawl D^5 to move the ratchet D^4 one tooth. This movement of the ratchet causes the shaft E^9 to be moved so that movement of the cam thereon engaging between the bifurcations of the yoke on the arm E^2 will move the latter laterally sufficiently to move the ribbon-spools laterally on their shafts, so as to bring a different surface of the ribbon into operative position. The ribbon-spools, as will be readily understood, are mounted for movement lengthwise of their shaft and should move by the engagement of the pressure-rollers D^3 , the latter engaging the flanges or heads of the ribbon-spools between which they are mounted to work. The ends of the ribbon-spool shafts are free, so that the spools may be readily placed thereon or removed when it is desired to replace them by a new ribbon and spool. It will thus be seen that not only is the direction of the movement of the ribbon automatically reversed at each end of its movement, but at each such reversal the ribbon is shifted laterally, so as to bring a different lateral surface thereof into operative position.

The carriage is given the usual step-by-step feed in the ordinary way, the feed-pawls F F

(seen in Fig. 4) being mounted on the block F^2 , and in order to provide a firm abutment for said block to prevent injury thereto and to the pawls by the movement of the carriage I provide the block F^2 , upon which is mounted the friction-roller F^3 on a suitable vertical pivot, as seen in Fig. 4, by which means I not only provide a firm abutment for the block carrying the feed-pawls, but materially reduce the friction, the said friction-roller being so mounted as to be engaged by the block F' in its reciprocatory movements. The ordinary step-by-step feed-rack F^4 , with which the pawls F engage, is shown as thrown back in Fig. 4 and is shown in operative position in Fig. 1. It is provided with ears f^7 , sleeved upon the guide-rod F^5 .

The rear guide-rod F^5 is mounted in lugs a^7 on the rear portion of the top of the machine, as seen in Figs. 6 and 7. The front guide-rod G is secured to and mounted upon the arms G' , secured to the rocking shaft G^2 , which is mounted in suitable lugs or supports depending from the under side of the top A^5 of the machine near the front, and this rod and the uprights are designed to be moved backward and forward to shift from upper to lower case, or vice versa, by simple and novel means illustrated clearly in Fig. 7, in which a finger-lever G^3 is shown which is pivoted upon the shaft G^2 in any suitable manner, and this lever is provided with a cut-away portion g and shoulders g' g^2 , all as clearly shown in Fig. 7, and the upright or arm G' upon this side of the machine is provided with a projecting pin G^4 , designed to be engaged by either of the said shoulders to hold the front shift-rod in either its backward or forward position. A spring G^5 is employed, one end of which is connected in any suitable manner to some fixed part, as the top of the machine, and its other end engaging a stud g^3 on the lever G^3 , as clearly shown in Fig. 7. The arm G' upon this side of the machine is provided with a rearwardly-extending arm G^6 , the inner end of which is connected by a link or ligament G^7 with a shift-key lever G^8 , as indicated by dotted lines in Fig. 7, whereby the carriage may be shifted to upper or lower case by the manipulation of said key.

H, Figs. 1 and 4, is the margin-regulator rack-bar, suitably mounted upon the top of the machine and carrying at its center the index-finger or pointer H' . H^2 is a stop slidably mounted upon this rack-bar and provided with a spring-actuated pawl H^3 , designed to engage with the teeth of the rack, this stop being adjustable to regulate the margin, the carriage being provided with a depending part or abutment to engage therewith, as will be readily understood. Slidably mounted upon this rack-bar upon the opposite side of the center is a stop H^4 , having a spring-actuated pawl H^5 for engagement with the teeth of the rack and designed to be adjustable to cause the bell to ring at any predetermined point, the stop H^6 for engagement

therewith being pivotally mounted, as at h , on the platen-carriage and designed to engage the bell-hammer H^7 , pivotally mounted upon the carriage and designed to sound the bell H^8 in the usual way. The stops H^2 H^4 , either or both, may be arranged to be manipulated from the front of the front guide-rod in any suitable manner so that they may be adjusted without lifting the carriage.

In Fig. 4 I have shown the block or stop H^4 as provided with an arm h' , while the pawl H^5 is provided with an extension or arm h^2 , by the movement of which in the direction of the arrow in said Fig. 4 the pawl will be disengaged from the rack, when the block or stop may be moved in either direction by the arm h' , and when pressure is removed from the arm h^2 the spring of the pawl forces the latter into contact or engagement with the rack, and thus locks the block or stop in its adjusted position.

I is the jump-feed or column regulator rack-bar, suitably mounted at the rear of the machine, as seen best in Fig. 4, and provided with the removable pin i , of usual construction, adapted to be inserted into any one of the holes in the rack to regulate the space between the columns, while upon the carriage is pivotally mounted an arm or lever I' , pivoted at i' and adapted to be thrown down into the path of the said pin, so as to engage the same when tabulated work is to be performed.

I^2 is an arm projecting from the usual step-by-step feed-rack F^4 and adapted to be engaged by the arm I^4 , pivotally mounted at the left-hand side of the carriage and its front end terminating in a finger or thumb-piece I^5 , as shown best in Fig. 1, by pressure upon which the rear end of the arm I^4 is brought against the under side of the arm I^3 and the rack-bar F^4 lifted from engagement with the feed-pawls, so that the carriage may be moved in either direction, as may be desired.

J is the platen, of usual construction, and J' is the roll between which and the platen the paper is designed to pass. J^2 is the scale holding the roll up by means of the springs J^3 , connected as shown in Fig. 16, so that the platen and roll are kept in contact for feeding the paper, the scale being arranged as shown, so as to practically cover the roll J' , as shown, the scale and the roll being both mounted in the end plates j of the frame, said end plates being connected by the back connecting-bar j' , as seen in Figs. 16 and 17.

J^4 is a bar or rod which extends from one side to the other of the platen-frame and is detachably connected to the end plates j in any suitable manner, as seen in Fig. 16. On this rod are the guide-springs J^5 , one at each end, which may be arranged as seen in Fig. 16, where they are shown as attached at one end to the rod J^4 and at the other end to the scale J^2 , the said guide-springs just barely touching the platen on the line of printing; or these springs may be arranged as shown in Figs. 1 and 2, where they are shown as free at the end be-

neath the platen, while the other end is attached to the rod J^4 and is rendered adjustable by means of a screw j^3 , passed through the said rod or bearing upon the spring between its front bend and the platen, as clearly shown in Fig. 2. When paper is introduced between the platen and the roller, the scale J^2 is depressed to allow of the free passage of the paper between the platen and the guide-springs J^5 , and when the paper has been fed forward, so that the same is no longer in contact with the roll J' , then the tension on the scale J^2 presses the guide-springs J^5 up against the paper and holds it there to allow of printing to the very lower edge of the paper, whereby the last line of printing on the paper will be straight and parallel with the preceding lines. On the rod J^4 , I mount frictionally the clamp or sliding piece J^6 , which is preferably blanked out and formed with ears j^3 to receive the pin j^4 , as seen in Figs. 16 and 17. On this pin is pivoted the curved spring-piece J^7 , which is also provided with ears j^7 for this purpose, as seen best in Fig. 16, and on the concave surface of this piece J^7 , I mount the curved piece J^8 , so that it may be slid along beneath the piece J^7 and fastened either at the extreme top, as shown in the drawings, or at a point where the small roll j^5 , carried by the lower end of the piece J^8 , may be brought into contact with the roll J' . This sliding movement may be provided for in any suitable manner, in this instance being shown as a thumb-nut j^8 , secured in the under piece J^8 , and passing through coincident slots j^6 in the curved pieces J^7 and J^8 , as clearly shown in Fig. 16.

The piece J^7 is tensioned by the spring J^9 , as seen best in Fig. 16, which is arranged between the ears thereof around the pin j^4 , so that the roll j^5 , which is loosely pivoted in the ears formed at the lower end of the piece J^8 , may always rest in contact with the platen, as seen in Fig. 17. Now when the paper is introduced the guide-springs J^5 carry the paper along until the top edge nearly reaches the roll j^5 , when the pressure upon the thumb-nut j^8 tilts the roll j^5 away from the platen and allows the insertion underneath of the paper without lifting up of the carriage, and after the lower edge of the paper has left the roll J' then the roll j^5 acts as the feed to allow of writing to the very bottom edge of the paper, as will be readily understood.

When it is desired to write upon envelopes, the sliding piece J^6 is slid along upon the rod J^4 , where it will allow the envelop to be taken to allow of writing as much as may be desired on the envelop. After such adjustment the piece J^8 is slid down, so that the rolls j^5 and J' are in contact, when said piece is fastened in such position by the thumb-nut. It will thus be seen that the envelop need only be introduced into the carriage and fed along without lifting the carriage or doing anything else than to merely rotate the platen to the point where it is desired to commence the writing. The shaft or journals j^9 of the platen

are passed through and rotatably mounted in the end pieces j of the platen-frame, and upon one end thereof is secured the bell H^8 , the edge of which is milled, as shown in Fig. 1, and by which the platen may be rotated by hand, as may be desired. The extended ends of the platen shaft or journals are removably mounted in the carriage K, and in Figs. 1 and 3 I have shown one means of thus detachably holding the said platen-journals. In this form the carriage is formed with the lugs k , undercut or shoulders, as seen in Fig. 3, while upon lugs k' , to the rear thereof, are detachably pivotally mounted, as by the screws k^2 , the arms K' extending parallel with the end bars of the carriage, their forward ends being provided with depressions or sockets K^2 , as shown best in Fig. 3, to receive the journals of the platen, the said arms being extended rearward of their pivots and downwardly to engage stops k^3 on the carriage. Between the pivot and the journal-receiving socket there is arranged a spring K^3 , upon which the said arm rests, and this spring is arranged in a socket k^4 , formed on the carriage K, as seen in Fig. 3. By depressing the arms K' into position indicated in full lines in Fig. 3 the platen-journals may be readily removed. They may be readily inserted by placing them upon the front ends of the arms K' , when by pressure thereon the journals can be easily forced into position, and when once in place the springs force the arms up and lock the platen against accidental displacement, but permitting of its easy rotation. The platen-carriage K is provided at its front side with the rollers K^4 , adapted to run upon the front rod G, as shown. The carriage K has extending from its rear portion the rearwardly-extending perforated ears K^5 , as clearly shown in Fig. 1, which are detachably secured to so as to move with the carrier-frame L, which consists of the boxes or frames L' , in which are journaled the axes l of the rollers L^2 , which ride upon the rear guide-rod E^5 , the said ears being detachably secured to the boxes, in this instance by the thumb-screws l' , as seen best in Fig. 1.

The boxes L' are formed with ears or lugs l^2 , perforated to receive and which ride upon the rear guide-rod F^5 , as seen best in Fig. 4, where the carriage and platen are removed and the step-by-step feed rack-bar F^4 and the carrier-frame are thrown back in order to better disclose other parts.

The means employed for connecting the ears of the frame K with the boxes L' permit of the pivotal movement of the carrier-frame L, which movement is limited in its downward direction by means of the pins l^3 , projecting from the said frames or boxes L' and engaging upon the lugs l^4 of the rear portion of the carriage K, as clearly illustrated in Fig. 1. By removal of the thumb-screw l' the frame K with all its accessories can be removed for the purpose of cleaning or otherwise. In shifting the carriage to change from upper to lower

case, or vice versa, the carriage K and its accessories moves in a horizontal plane, while the carrier-frame L and its boxes and rollers rocks upon the rear rod F^5 , turning upon the screws l' as a pivot. To further guide the carriage in its back-and-forth movements when it is shifted for upper or lower case letters, I provide the bifurcated guide-arm L^3 , secured to the under side of the rear portion of said carriage, loosely embracing a guide-screw or other means L^4 , secured to the upper face of the ordinary step-by-step feed-rack F^4 , as shown best in Fig. 1.

Fast upon the platen shaft or journal is the ratchet M, (seen best in Figs. 1 and 5,) and the platen is designed to be rotated, when required, by means of the lever M' , pivoted at m on a lug or riser on the carriage K, the said lever having an extension m' beyond its pivot and beyond the journal of the platen, as seen in Fig. 5, and to the end thereof is pivoted, as at m^2 , the pawl M^2 , the upper end of which is hooked, as seen at m^3 in Fig. 5, and extended into the plane of the ratchet-wheel, so that by manipulation of the lever M' the ratchet-wheel may be turned one or more teeth and the platen revolved. A spring m^4 connects at one end with the pawl and at the other end fastened around the pivot of the same, as seen in Fig. 5. The outer face of the pawl is provided with a cam portion m^5 , adapted to engage a pin or projection m^6 on the carriage K, which serves to normally hold the tooth end of the pawl out of engagement with the ratchet, but when the lever M' is moved on its pivot the said cam moves under an engagement with said pin, thereby bringing the tooth end of the pawl into engagement with the ratchet when the further movement of the lever M' rotates the platen. When pressure is removed from the lever M' , the parts return to their normal position, the cam portion engaging under the pin m^6 and throwing the tooth end of the pawl away from and out of engagement with the ratchet.

The limit of movement of the platen is regulated by the readable line-space-regulating device seen best in Figs. 4 and 10, in which the lever M' is shown as provided with an upwardly-projecting bearing or standard M^3 , which is bored from front to rear, and in this bore is arranged a rotatable regulator M^4 , which is provided with a circumferential groove M^5 , in which works the pin or screw M^7 , (see Fig. 10,) which permits of rotation of the regulator M^4 , but holds it against endwise movement. The inner end of this regulator is provided with a series of notches m^8 in steps, as seen in Fig. 5, the other end of the regulator being provided with a collar and shoulder m^9 , bearing against the face of the extension M^3 and provided with a series of slight depressions M^6 , into any one of which is designed to engage the pin M^7 , the upper end of which is rounded or pointed, so as to readily slip into the depression, the said pin being mounted for vertical movement in a

socket in the extension M^3 , being seated upon a spring M^8 , located in said socket, which serves to normally keep the pin uppermost, but permitting of depression thereof when the regulator is turned. The outer end of this regulator is polygonal in form, as seen in Fig. 10, and upon its faces are designating-characters, as seen in Fig. 10. By rotation of this regulator the desired notch in its inner end may be brought into position to be actuated by the engaging means therefor, which will soon be described, and by means of which the platen is permitted to be turned one, two, or three or more teeth by a single manipulation of the lever M' , the pin M^7 readily seeking its depression and holding the regulator against farther movement accidentally. The inner end of this regulator is designed to be engaged by the lever N, pivoted at n on one of the end plates j of the platen-carriage, being provided with a spring n' , as seen in Fig. 5, and having a curved extension N' , in the free end of which is journaled a roller N^2 , arranged in vertical line with and adapted to bear against the ratchet M to prevent retrograde movement thereof accidentally, but permitting, through the resiliency of its spring-levers, rotation of the platen by hand when desired. The vertical face of this lever N is arranged in the path of and designed to be engaged by the notch or notches of the regulator as the lever M' is manipulated to revolve the platen. The platen and its carrier, together with the ratchet, and the lever N, with its roller and spring, are all removable bodily from the carriage, when desired, by the means heretofore described and shown in Fig. 3.

O is the paper-table. It is detachably connected with the end plates j of the platen carrier or frame by means of the pins o at the ends thereof, which are detachably engaged in openings o' in the rear ends of the said end pieces j , as seen in Figs. 1 and 2. The rear edge of the paper-table is engaged detachably in the free ends of the arms O' , which are pivotally mounted on a shaft P, mounted in the curved plates P' , which are fast upon said shaft, the shaft and plates being designed to move pivotally, the inner faces of the curved plates P' being provided with pins p' , between which the arms O' work, whereby the latter have a limited play or movement of themselves independent of their movement of the curved plates. The plates P' are further connected by the rod P^2 , with which rod is designed to be detachably engaged by the upper hooked end p^2 of the arm P^3 , the lower end of which is pivotally connected, as at p^3 , with the lugs p^4 , Fig. 15, extending upward from the rear cross-rod P^4 of the bail P^5 , which is detachably mounted at its forward end upon the rod P^6 , suitably supported in the frame A near the front, as seen best in Fig. 8. This bail is shown in Fig. 15 as provided with bosses or analogous devices p^5 , sleeved upon the rod P^6 and held in position by the set-screws p^6 , whereby the same may be read-

ily removed when desired, the rod P^6 being also removably supported in its bearings on the frame. This bail is connected at one end with a special key-lever P^7 by means of the ligament or link p^7 , which is pivotally connected at both ends, the said special key-lever P^7 extending to the front of the machine and by the manipulation of which the platen is tilted so that the writing may be readily inspected. In Fig. 8 the parts are shown in the position which they occupy when the said lever is depressed and the platen has been tilted. In order to lock the parts in their normal position during the process of writing, I extend one of the pins o' on the end of the paper-table, as seen in Fig. 5, with which is designed to engage the hooked end q of the lever Q , pivoted at q' on the end of the carriage K , and at its free end carrying a roller Q' , with which the cam portion P^8 of the curved plate P' at that end is designed to engage when the lever P^7 is depressed to tilt the platen, thus throwing the hooked end q of the lever Q out of engagement with the extended end of the pin o' and allowing the platen to be tilted and the parts to assume the position in which they are shown in Fig. 8. A spring Q^2 is provided upon this lever to normally hold it in engagement with the said pin, as seen in Fig. 5, and a spring Q^4 is provided, as shown in Fig. 8, acting upon the shaft P to aid in returning the platen and paper-table to their normal position as soon as pressure is relieved from the lever P^7 . The curved plate P' at the left-hand end of the machine is provided with a finger-lever P^9 , by means of which the platen may be tilted by hand when desired without manipulation of the lever P^7 .

In order to lock the keys against actuation when the end of a line or a predetermined point is reached, and thus prevent the writing of one letter upon another, I attach to the universal bail R , which of course is actuated by the space-bar R' as well as at the depression of each key-lever, a rod R^2 , vertically disposed and adjustably connected with said universal bail, as seen in Fig. 7, and the upper end of this rod is adjustably and detachably connected with a headed projection R^3 , which is adapted to work easily in an opening in the top A^5 of the machine, as shown, while pivoted at the rear of the machine, as at s , is an arm S of such a thickness as to be readily forced under the head of the part R^3 when the latter is in its uppermost position, as seen in Fig. 7, a spring S' being provided, one end being attached to the said arm and the other end free and working against a pin s' on the top A^5 of the frame, as seen best in Fig. 4. The arm S is pivoted upon its upper face near its free end with a pin s^2 , (shown in Figs. 4 and 7,) with which pin is designed to engage the forked arm T , depending from the rear of the carriage K , and, as shown in Figs. 1 and 8, adjustably mounted upon a rod or bar T' ,

carried upon the said carriage K and designed to be adjusted to bring the said forked arm so that it will engage with the pin of the arm S at a predetermined point in the movement of the carriage, and as said arm engages the pin it moves the arm S with it until the latter is moved under the head of the pin or part R^3 , as seen in Fig. 7, and thus locking the carriage against movement and the key-levers against depression sufficient to force the type against the platen. When it is desired to release the arm S , the shift-lever is depressed, and as the carriage is moved rearward the opening in the forked arm is brought coincident with the pin s^2 on the arm S and when the same becomes coincident the spring S' forces the arm S in the direction of the arrow in Fig. 4, consequently releasing it from engagement with the head of the part R^3 .

The spring for propelling the carriage forward is of well-known construction, as is the means for regulating the tension thereof.

The tension on the step-by-step feed-dogs F is regulated by means of a thumb-screw U , mounted in a suitable bearing u , depending from the rear of the top A^5 , as seen best in Fig. 6, and connected with the block F' , carrying the dogs or pawls F by a spring U' , as seen in Fig. 6. Adjustment of this screw regulates the tension of the dogs. This means is placed in a most convenient position and is easy of manipulation.

Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What I claim as new is—

1. The combination of a platen, a rocking bail located beneath the platen, a key-lever, and connections between the key-lever and the bail, a bar pivotally mounted on said bail, and a jointed connection between said bar and the platen-support, and pivotal connections between the support and the platen-carrying frame; substantially as described.

2. The combination of a platen-carrying frame, a paper-table and a jointed connection between the same, a key-lever, a rocking bail located beneath the platen, and intermediate connections between the key-lever and bail and between the bail and the jointed connection between the platen and paper-table, whereby the depression of the lever moves the platen and paper-table on the pivot of said jointed connection; substantially as described.

3. The combination of a platen-carrying frame, and a paper-table pivotally connected thereto by means of a downwardly-breakable joint, a key-lever, and intermediate connections, whereby the depression of the lever moves the platen and paper-table on the pivotal connection therebetween, and means for locking the platen and table against tilting; substantially as described.

4. The combination of a platen-carrying frame and a paper-table pivotally connected

- thereto by a jointed connection, a key-lever and intermediate connections whereby the depression of the lever moves the platen and paper-table on the pivotal connection there-
 5 between, and means for automatically locking the platen and table against tilting; substantially as described.
5. The combination of a platen-carrying frame, a paper-table pivotally connected
 10 therewith by a jointed connection, a lock for locking the same against tilting, a key-lever, and connections whereby the depression of the lever first disengages the lock and then
 15 tilts the platen and paper-table; substantially as described.
6. The combination of a platen-carrying frame, a paper-table connected for simultaneously tilting movement with the platen to
 20 and from each other, means for locking the same together against such movement, a key-lever, and mechanism for removing said lock and tilting the platen and paper-table; substantially as described.
7. The combination of a platen-carrying
 25 frame and paper-table pivotally connected therewith and mounted on a rocking carrier, a key-lever, and connections between the same and said carrier for tilting the platen and paper-table; substantially as described.
- 30 8. The combination of a platen-carrying frame and a paper-table pivotally connected to move together and mounted on independent pivots to move simultaneously toward or
 35 from each other, a key-lever, a rocking bail connected therewith, and means connecting the bail and the carrier of the paper-table; substantially as described.
9. The combination of a platen-carrying frame, a paper-table pivotally connected
 40 therewith, a key-lever, a rocking bail actuated thereby and located beneath the platen, a connection between said bail and the paper-table carrier, and means for locking the platen and table against tilting; substantially as described.
- 45 10. The combination of a platen-carrying frame, a paper-table pivotally connected therewith, a key-lever, a rocking bail actuated thereby and located beneath the platen,
 50 a connection between said bail and the paper-table carrier, and means for automatically locking the platen and table against tilting; substantially as described.
11. The combination of a platen-carrying
 55 frame, a paper-table mounted to rock, and pivotally connected with the platen, a rocking bail, a key-lever connected therewith, a lock for the platen, and connections with the bail for disengaging the lock and tilting the
 60 platen; substantially as described.
12. The combination of a platen and a paper-table mounted to rock and detachably
 65 mounted on independent pivots on the platen-frame and connected therewith by a jointed connection; substantially as described.
13. The combination of a platen, a paper-table pivotally and detachably mounted
 thereon, and means engaging one of the pivots of the table to lock the platen and table
 against tilting movement; substantially as described.
14. The combination of a platen and a paper-table pivotally mounted on the carrier
 thereof, a lock for preventing tilting movement of the table and platen, and a cam for
 75 disengaging the lock and mounted for actuation by a key-lever; substantially as described.
15. The combination of a platen and a paper-table pivotally connected together, a lock
 80 engaging one of the pivots thereof, a cam for disengaging the lock, and a key-lever for actuating the same; substantially as described.
16. The combination of a platen-carrying frame, a paper-table pivotally connected
 85 therewith and pivotally connected at its rear edge, a lock for preventing tilting movement of the platen and table, a rocking frame for the paper-table, and a cam on said frame for disengaging the lock; substantially as described.
17. The combination of a platen-carrying frame and a paper-table mounted at its rear
 end for rocking movement pivotally connected to be tilted simultaneously, said paper-
 95 table being also mounted on an independent pivot at its rear edge, and an automatic lock for preventing such tilting movement; substantially as described.
18. The combination of a platen-carrying
 100 frame and a paper-table mounted at its rear end for rocking movement pivotally connected for conjoint tilting movement, the latter pivoted at its rear edge on a pivot independent of the pivotal connection between
 105 said table and platen, an automatic lock for preventing such movement, and a rocking frame for the paper-table having means for disengaging said lock; substantially as described.
19. The combination of a platen-carrying
 110 frame, a paper-table mounted at its rear end for rocking movement pivotally connected therewith and constructed to move simultaneously in opposite directions, a rocking
 115 frame carrying a paper-table, a pivoted lock for preventing tilting movement of the platen and paper-table, and means on the said rocking frame for engaging the pivoted lock; substantially as described.
20. The combination of a platen-carrying
 120 frame, and a paper-table pivotally connected for conjoint movement, a rocking frame carrying the paper-table, a lock for preventing tilting movement of the platen and table, a
 125 key-lever, and a rocking bail connected therewith and with the said rocking frame; substantially as described.
21. The combination of a platen-carrying
 130 frame, and a paper-table pivotally connected therewith, a lock for preventing tilting movement of the platen and paper-table, a key-lever, a rocking bail connected therewith, a rocking frame carrying the paper-table and

adapted to operate said lock, and a connection between the rocking bail and the rocking frame; substantially as described.

22. The combination of a platen-carrier frame, a paper-table detachably and pivotally connected therewith, a pivoted lock adapted to coöperate with one of the pivots of the table to prevent tilting movement thereof, and means on the paper-table carrier for actuating said lock; substantially as described.

23. The combination of a platen-carrier frame, and a paper-table mounted for conjoint tilting movement, a pivoted arm having a hook to engage one of the pivots between the table and the platen and provided with an arm carrying a roller, and the rocking frame carrying the paper-table having a portion adapted to engage said roller; substantially as described.

24. The combination of a platen-carrier frame, and a paper-table pivotally connected for conjoint tilting movement, means for preventing such movement, and means on the paper-table carrier for disengaging the lock to permit of the tilting movement; substantially as described.

25. The combination of a rocking frame, a paper-table carried thereby, a finger-lever mounted in one of the end plates of said frame, and projections on said plate actuating the rocking frame; substantially as described.

26. The combination of a platen and a paper-table pivotally united for conjoint tilting movement on said pivot, said paper-table being pivotally mounted on an independent pivot at its rear edge, a lock for preventing such movement, and a finger-lever provided with projections for actuating the rocking frame carrying the paper-table and for disengaging said lock; substantially as described.

27. The combination of a carriage, a platen, a paper-table pivotally and detachably connected with the frame thereof, and line-feed mechanism removably mounted upon said carriage; substantially as described.

28. The combination of a carriage, a rocking frame thereon, a paper-table carried by said rocking frame, pivotally and detachably connected therewith, and a platen detachably mounted on the carriage and detachably connected with the paper-table; substantially as described.

29. The combination of a carriage, a rocking frame thereon, a paper-table pivotally mounted at its rear edge on the said rocking frame, and a platen detachably mounted on the carriage and detachably and pivotally connected with the paper-table; substantially as described.

30. The combination with the platen and the ratchet, of a rotatable regulator, a lever pivotally mounted on one of the end plates of the platen-carrier frame, and having a curved extension, said lever being mounted to engage the end of said regulator, and a

roller journaled in the free end of said extension and bearing against the ratchet to prevent retrograde movement thereof; substantially as described.

31. The combination with the platen and the ratchet, of a rotatable regulator, a lever pivotally mounted on one of the end plates of the platen-carrier frame, and having a curved extension, said lever being mounted to engage the end of said regulator, and a roller journaled in the free end of said extension and bearing against the ratchet to prevent retrograde movement thereof, said platen, its carrier, and the ratchet and lever being all removable bodily from the carriage of the machine; substantially as described.

32. The combination with the platen and the ratchet, of a rotatable regulator, a lever pivotally mounted on one of the end plates of the platen-carrier frame, and having a curved extension, said lever being mounted to engage the end of said regulator, and a roller journaled in the free end of said extension and bearing against the ratchet to prevent retrograde movement thereof, and a spring around the pivot of said lever with one end attached to the lever, and the other to the end plate of the platen-frame; substantially as described.

33. The combination of the line-space lever and a line-space gage rotatably mounted thereon, and having its inner end provided with a series of notches at varying distances from the end to limit the rotation of the platen; substantially as described.

34. The combination of a line-space lever, a line-space gage rotatably mounted thereon and held against endwise movement and having a series of depressions, and means engaging said depressions for holding the same in its adjusted position; substantially as described.

35. The combination of the line-space lever, a line-space gage rotatably mounted therein and provided with depressions, and a vertically-disposed spring-actuated pin held in the lever and adapted to engage said depressions to lock the gage in its adjusted position; substantially as described.

36. The combination of the carriage and the platen and its ratchet with a pivoted pawl having a cam portion projecting therefrom near its center, and a pin projecting laterally from the carriage for engaging the upper face of the same to automatically throw said pawl out of engagement with the ratchet; substantially as described.

37. The combination of the carriage and the platen and its ratchet with a pivoted pawl having a cam portion projecting therefrom near its center, a pin on the carriage for engaging the same to automatically throw said pawl out of engagement with the ratchet, and a spring acting on said pawl to throw it into engagement with the ratchet; substantially as described.

38. The combination with the platen and

the platen-carrier, of a rod connecting the end plates thereof, and spring-metal paper-guides carried by the said rod and extended to the front of the platen and having its end bent upon itself, and a set-screw passed through the rod and bearing against the free portion of the guide to adjust the same; substantially as described.

39. The combination with the platen and the platen-carrier, of a scale pivotally mounted on the platen-carrier and extended beneath the same, and a roller carried by said scale adapted to bear upon the under side of said platen; substantially as described.

40. The combination of the platen, the platen-carrier, the scale pivotally mounted on the carrier, the roll parallel with the platen, the springs acting on the pivots of the scale, and the paper-guides connected at one end to said scale; substantially as specified.

41. The combination with the platen and the platen-carrier, of a finger concentric with the platen and composed of two parts slidably connected and one of which is pivotally mounted and a roller carried by one of said parts; substantially as described.

42. The combination with the platen and the platen-carrier, of the roll parallel with the platen and bearing against the under side thereof, and the finger adjustable on the platen-carrier and provided with a roll movable to and from the first-mentioned roll; substantially as described.

43. The combination with the platen and the platen-carrier and the rod connecting the end plates thereof, of a slide mounted on said rod and a two-part, adjustable finger with one part slidably mounted upon the other and both carried by the slide and provided with a roller; substantially as described.

44. The combination with the platen and platen-carrier and rod connecting the end plates thereof, of a slide adjustably sleeved on the rod, a curved part pivotally mounted on the slide, and a curved part carrying a roller and adjustable on said pivoted, curved part; substantially as specified.

45. The combination with the platen and platen-carrier and rod connecting the end plates thereof, of a slide adjustably sleeved on the rod, a curved part pivotally mounted on the slide, a curved part carrying a roller and adjustable on said pivoted, curved part, and a spring around the pivot of the pivoted, curved part; substantially as described.

46. The combination with the platen, of the paper-holding finger composed of two parts, one pivotally mounted and one mounted to slide on the other, and adjustable concentric with the platen and carrying a roller adapted to bear against the under side of said platen; substantially as described.

47. The combination with the platen and the roller parallel therewith, of an adjustable paper-holding finger having a pivotally-mounted curved part and an adjustable part slidably mounted on a fixed part and carry-

ing a roller adapted to bear against the under side of the platen; substantially as described.

48. The combination with the rear guide-rod and the roller-frame movable thereon, of the platen-carriage detachably connected with said roller-frame, and the paper-table pivotally mounted in the carriage and pivotally and detachably connected with the roller-frame; substantially as described.

49. The combination with the rear guide-rod and the roller-frame movable thereon, of the platen-carriage pivotally and movably connected with said roller-frame, and the paper-table pivotally mounted in the carriage and pivotally and detachably connected with the roller-frame; substantially as described.

50. The combination with the rear guide-rod and the roller-frame movable thereon, of the platen-carriage pivotally connected with said roller-frame, and the paper-table pivotally mounted in the carriage and pivotally and detachably connected with the roller-frame, and means for limiting the pivotal movement of said parts; substantially as described.

51. The combination with the step-by-step feed rack-bar, of a rocking frame mounted to move therewith, and the platen-carriage removably connected with said roller-frame, and the paper-table pivotally mounted in the carriage, and pivotally and detachably connected with the roller-frame; substantially as described.

52. The combination with the step-by-step feed rack-bar and the roller-frame mounted to move therewith, of a platen-carriage removably and pivotally connected with said roller-frame, and the paper-table pivotally mounted in the carriage and pivotally and detachably connected with the roller-frame; substantially as described.

53. The combination with the rear guide-rod and the step-by-step feed-rack and the roller-frame mounted to move therewith, of the platen-carriage pivotally connected with the roller-frame, and the paper-table pivotally mounted in the carriage and pivotally and detachably connected with the roller-frame, and means for guiding the platen-carriage in its movements; substantially as described.

54. The combination with the rear guide-rod, the step-by-step feed-rack and the roller-frame mounted to move therewith, of the platen-carriage pivotally connected with the roller-frame, and the paper-table pivotally mounted in the carriage and pivotally and detachably connected with the roller-frame, and means on the said rack for guiding the platen-carriage in its movements; substantially as described.

55. The combination with the platen-carrier mounted to reciprocate from front to rear, and a platen and paper-table carried thereby and mounted to tilt simultaneously in opposite directions, of a shift-lever and connection

for moving said carrier bodily; substantially as described.

56. A platen-carrying frame mounted for reciprocation from front to rear and vice versa, combined with a platen mounted therein and a paper-table movable with said carrier, said platen and paper-table being mounted on independent pivots and connected by an independent lever to tilt simultaneously in opposite directions; substantially as described.

57. A platen-carriage mounted for reciprocation from front to rear and vice versa, combined with a platen and a paper-table pivotally connected therewith and mounted on the carriage to move with the same in its reciprocations and to be tilted simultaneously in opposite directions; substantially as described.

58. The combination with the back and front guide-rods, of a platen-carriage mounted to slide thereon and also for reciprocation from front to rear, a paper-table pivotally mounted in a carriage and pivotally connected with the platen-supports to tilt toward and from the platen simultaneously with its tilting movement, and a pivotal connection between the paper-table and the rear guide-roller supports; substantially as described.

59. The combination with the rear guiding-roller frame, of a platen-carriage pivotally connected therewith and mounted for simultaneous bodily reciprocation at right angles to the length of the guide-rod and for tilting movement in a plane parallel with said rod, a pivoted lever, and pivotal connections detachably connected with and constructed and arranged to tilt said carriage; substantially as described.

60. The combination with the pivotally-mounted front guide-rod, of a shift-lever mounted on the pivot of said guide-rod and having notches to engage a projection or stop on the support of the guide-rod, and a spring connecting said shift-lever with a fixed part of the frame; substantially as specified.

61. The combination with the pivotally-mounted front guide-rod and the supporting-arm thereof having a rearward extension, of a key-lever connected with said extension, a shift-lever mounted on the pivot of the guide-rod and having shoulders to engage a pin on the support of the guide-rod, and a spring connecting said shift-lever with a fixed part of the frame; substantially as described.

62. The combination with the carriage and the movable bail beneath all of the key-levers, of a keyboard-lock comprising a vertically-reciprocatory headed part and a pivoted part mounted on a vertical pivot, and adapted to be moved on said pivot to engage beneath the head of the vertical part, locking connections between said pin and the key-lever, and means carried by the carriage to engage and actuate said pivoted part; substantially as described.

63. The combination with the carriage and the movable bail beneath all of the key-levers,

of a keyboard-lock comprising a vertically-reciprocatory headed part and a pivoted part mounted on a vertical pivot, and adapted to be moved on said pivot to engage beneath the head of the vertical part, locking connections between said pin and the key-lever, means carried by the carriage to engage and actuate said pivoted part, and releasing means therefor actuated from the keyboard for lifting the carriage to disengage its means from said pivoted part; substantially as described.

64. The combination with the carriage and the movable bail beneath all of the key-levers, of a keyboard-lock comprising a vertically-reciprocatory headed part, and a pivoted part, mounted on a vertical pivot, and adapted to be moved on said pivot to engage beneath the head of the vertical part, locking connections between said pin and the key-lever, means carried by the carriage to engage and actuate said pivoted part, releasing means therefor actuated from the keyboard for lifting the carriage to disengage its means from said pivoted part, and a spring constructed and arranged to normally hold the pivoted part away from the vertically-reciprocatory part; substantially as described.

65. The combination with the carriage and the movable bail beneath all of the key-levers, of a keyboard-lock comprising a vertically-reciprocatory pin, an arm mounted on a vertical pivot, means on the carriage to engage said arm to move it under the head of said vertical pin, locking connections between said pin and the key-lever, and mechanism whereby said pin is thrown vertically into operation and released from the keyboard; substantially as described.

66. The combination with a movable bail extended under the key-levers and the carriage, of a lock therefor comprising a vertically-reciprocatory pin mounted to be thrown into operation by the movement of the carriage and to be released by the shift-key; substantially as described.

67. The combination with a movable bail extended under the key-levers and the carriage mounted for reciprocation from front to rear, of a lock therefor embodying a vertically-reciprocatory headed pin mounted to be thrown into operation by the longitudinal movement of the carriage and to be released by the front-to-rear reciprocation thereof; substantially as described.

68. The combination with a movable bail extended under the key-levers and the carriage mounted for movement from front to rear, of a lock against longitudinal movement of said carriage, and embodying a vertically-reciprocatory headed pin, and a releasing device mounted on the carriage; substantially as described.

69. The combination of the movable bail extended under the key-levers and the carriage and a lock therefor embodying an arm depending from the carriage and serving both as a retainer and a releaser, and a vertically-

reciprocatory headed pin and a pivoted part interposed between said pin and arm; substantially as described.

70. The combination with the movable bail
5 extended beneath all of the key-levers and the carriage and a bifurcated arm depending therefrom, of a vertically-movable stop, means for reciprocating the same vertically through the top of the machine, and a pivoted part
10 adapted to engage therewith and to be actuated by said arm; substantially as described.

71. The combination with the movable bail
15 extended beneath all of the key-levers and the carriage and a bifurcated arm depending therefrom, of a vertically-movable headed pin, means for reciprocating said pin through an opening in the top of the frame, and a horizontally-movable pivoted lever arranged in the path of said arm; substantially as described.
20

72. The combination with the movable bail
25 extended beneath all of the key-levers and the carriage and a bifurcated arm depending therefrom, of a vertically-movable headed pin and a horizontally-movable pivoted lever arranged in the path of said arm, a vertical projection on said lever, means for vertically reciprocating said pin, and a spring acting on said lever in opposition to the movement of
30 the carriage; substantially as described.

73. The combination with the movable bail
35 extended beneath all of the key-levers and the carriage mounted for bodily reciprocation from front to rear, of a bifurcated arm depending therefrom, a vertically-movable headed pin mounted for actuation by the space-bar, and a horizontally-movable pivoted lever having a projection adapted to be engaged by said bifurcated arm; substantially
40 as described.

74. The combination with a movable bail
45 extended beneath all of the key-levers, the carriage and a keyboard-lock therefor embodying a headed pin mounted for vertical reciprocation through an opening in the top of the frame, with its head above the top of said frame of means for varying the point in the line of travel of the carriage at which said lock shall be thrown into operative position;
50 substantially as described.

75. The combination with the carriage and a vertically-movable stop mounted for vertical reciprocation through an opening in the top of the frame, of a pivoted lever and a
55 bifurcated arm depending from and adjustably mounted on the carriage to cooperate with said lever; substantially as described.

76. The combination with the carriage and the column rack-bar, of a lever pivotally
60 mounted on the step-by-step feed rack-bar for cooperation with the column rack-bar; substantially as described.

77. The combination with the carriage and the column rack-bar mounted on the top of
65 the frame at the rear, of the step-by-step feed rack-bar and a lever pivotally mounted thereon and adapted to be turned on its pivot to

be thrown into or out of operative relation with the column rack-bar; substantially as described. 70

78. The combination with the step-by-step feed-pawls and the block on which they are mounted, of a roller-abutment therefor; substantially as described.

79. The combination with the step-by-step
75 feed-pawls and the block upon which they are mounted, of a spring connected with said block and a thumb-screw accessible from the rear of the machine for regulating the tension; substantially as described. 80

80. The combination with the step-by-step feed-pawls and the block in which they are mounted, of a spring connected at one end to said block, and a thumb-screw mounted in a lug depending from the top of the machine
85 and connected with the other end of said spring; substantially as described.

81. The combination with the carriage having notched lugs, of platen-holding arms pivotally mounted on the carriage and having depressions to receive the platen-journals and springs arranged between said depressions and the pivots of the arms, and a stop for the arms to the rear of their pivots; substantially as described. 90 95

82. The combination with the ribbon and ribbon-spools of an automatic reversing mechanism and a simultaneously-operating lateral ribbon-shift device embodying a yoke, a cam and a ratchet-and-pawl mechanism; substantially as described. 100

83. The combination with the ribbon and ribbon-spools and ribbon-feeding mechanism, of automatic ribbon-reversing devices and an automatic lateral shift for the ribbon embodying a yoke, a cam and a ratchet-and-pawl mechanism, actuated by the winding of the ribbon upon one of the spools; substantially as described. 105

84. The combination with the ribbon and
110 ribbon-spools and ribbon-feed mechanism, of a combined automatic reversal and lateral shift actuated by the tension of the ribbon thereon, the lateral shift embodying a yoke, a cam and a ratchet-and-pawl mechanism; substantially as described. 115

85. The combination with the ribbon and ribbon-spools and the feed mechanism for the same, of the pivoted frame at each side of the machine and rollers carried by said frames
120 and adapted to bear against the ribbon on the spool; substantially as described.

86. The combination with the ribbon, ribbon-spools and feed mechanism, of rocking frames at opposite sides of the machine, rollers carried thereby and adapted to bear on the ribbon between the heads of the spool, a pivoted bail having upwardly-extending portions engaging said rollers; substantially as described. 125 130

87. The combination with the ribbon, ribbon-spools and ribbon-feed, of a rocking frame having a cross-rod, rollers mounted to revolve thereon, and a pivoted bail adapted

to move said rollers and actuated by the lateral shift devices; substantially as described.

- 5 88. The combination with the ribbon, ribbon-spools and feed mechanism, of a rocking frame, a pawl carried thereby, a pivoted bail having a yoke, and a vertical shaft carrying a cam operating between the arms of the yoke and a ratchet to be engaged by said pawl; substantially as described.
- 10 89. The combination with the ribbon, ribbon-spools and feed mechanism, of a rocking frame, a pawl carried thereby, a pivoted bail having a yoke and a vertical shaft carrying a cam operating between the arms of the yoke
- 15 and a ratchet to be engaged by said pawl, and a spring-arm on the rocking frame to engage a shoulder on the shaft of the ribbon-feed mechanism; substantially as described.

90. The combination with the ribbon, rib-

bon-spools and feed mechanism, of a rocking 20 frame, a pawl carried thereby, a pivoted bail having a yoke, and a vertical shaft carried thereby, a pivoted bail having a yoke, and a vertical shaft carrying a cam operating between the arms of the yoke, and a ratchet to 25 be engaged by said pawl, a spring-arm on the rocking frame to engage a shoulder on the shaft of the ribbon-feed mechanism, and a pivoted arm actuated by the movement of the rocking frame to permit of endwise movement 30 of said shaft; substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES SPIRO.

Witnesses:

LUD FREUDENTHAL,
HARRY B. FINN.