

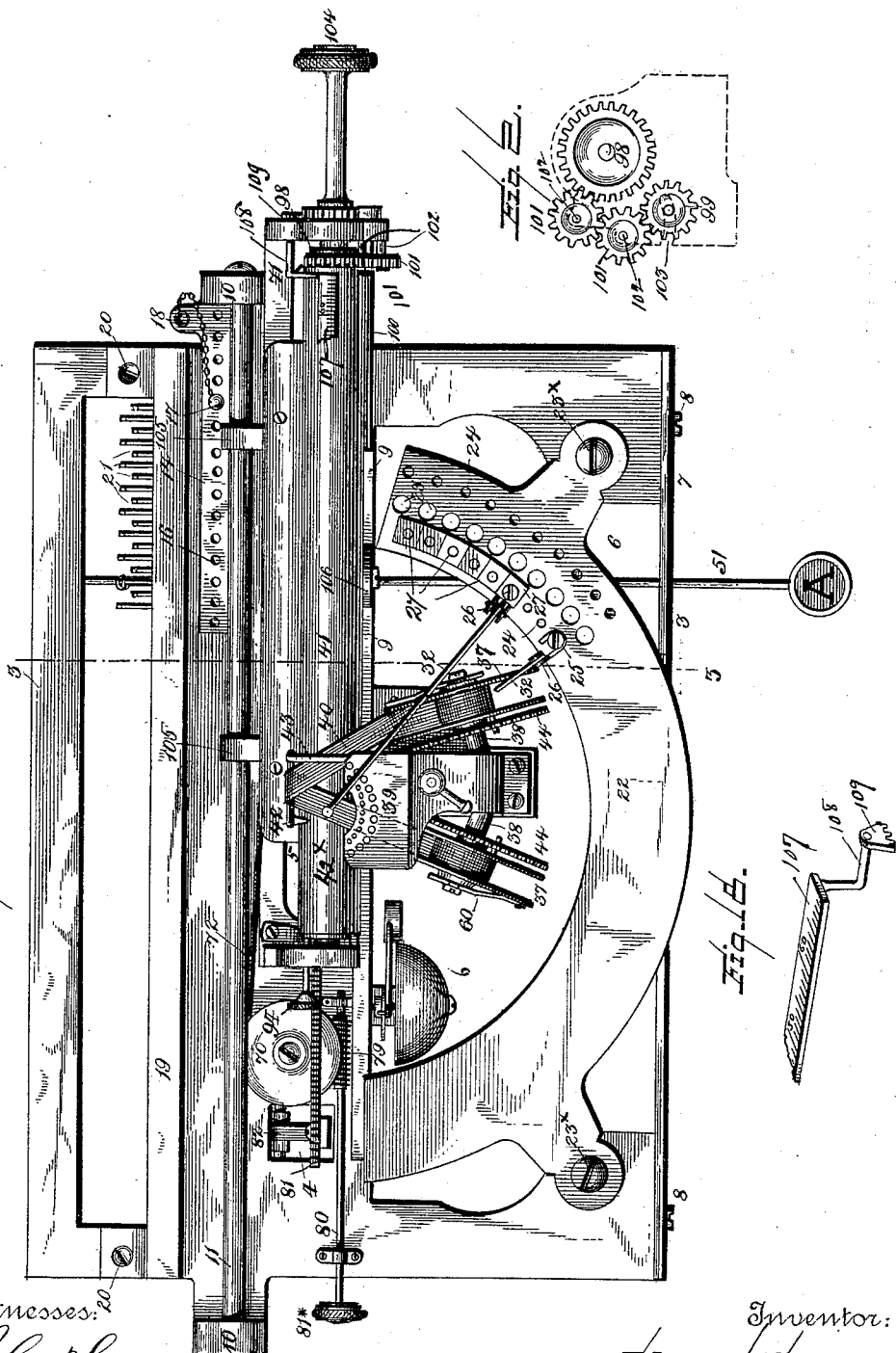
(No Model.)

3 Sheets—Sheet 1.

C. SPIRO.
TYPE WRITING MACHINE.

No. 422,042.

Patented Feb. 25, 1890.



Witnesses:

S. C. Hills,
W. D. Suwall.

Inventor:

Charles Spiro.
E. B. Stocking
Attorney.

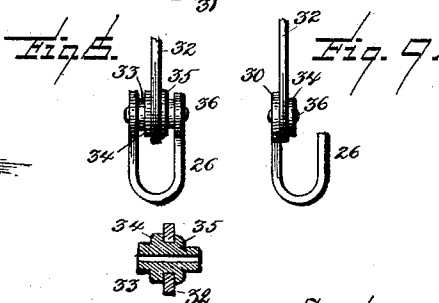
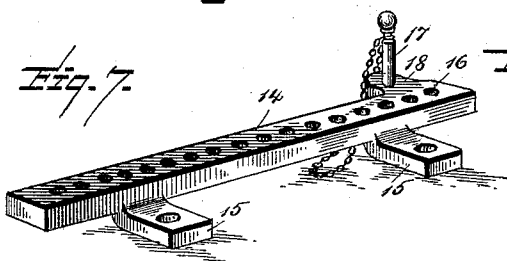
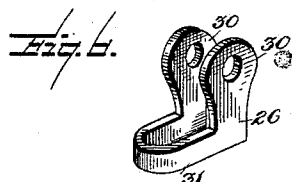
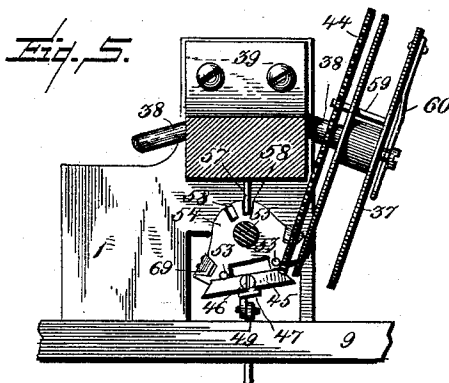
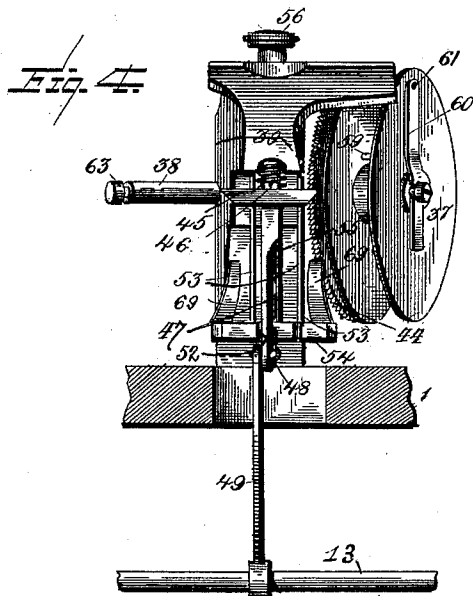
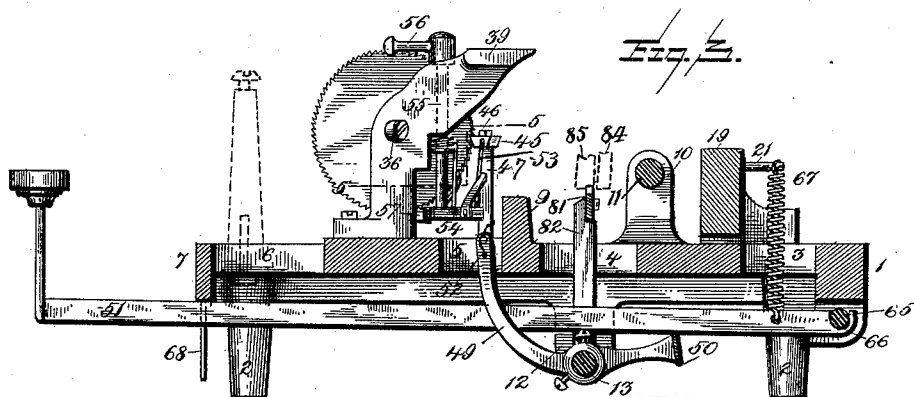
(No Model.)

3 Sheets—Sheet 2.

C. SPIRO.
TYPE WRITING MACHINE.

No. 422,042.

Patented Feb. 25, 1890.



Witnesses:

L. G. Hills
W. S. Duwall

Inventor:

Charles Spiro.
E. B. Stocking

Attorney.

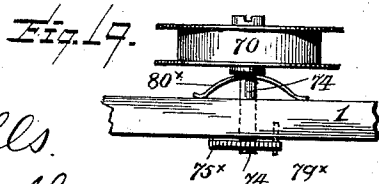
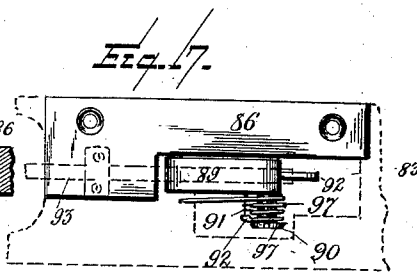
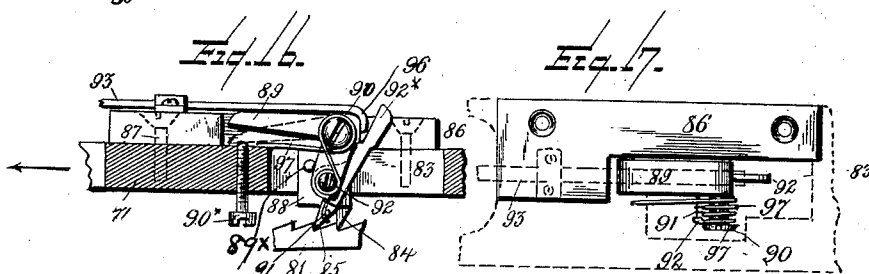
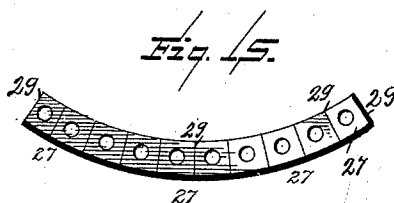
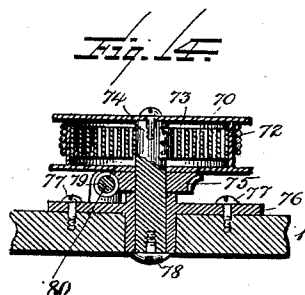
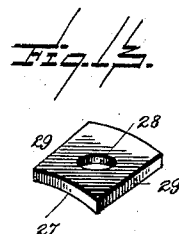
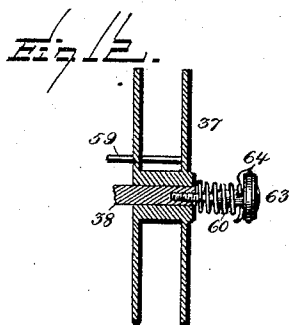
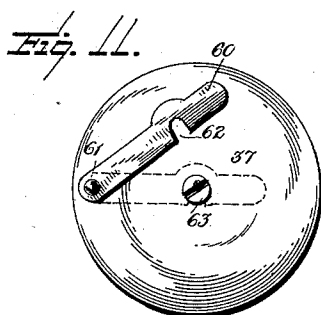
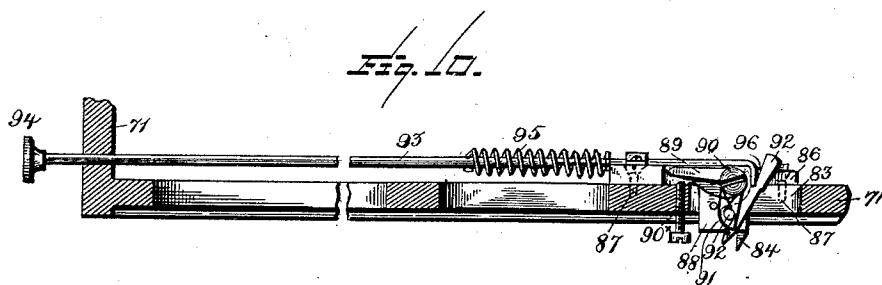
(No Model.)

3 Sheets—Sheet 3.

C. SPIRO.
TYPE WRITING MACHINE.

No. 422,042.

Patented Feb. 25, 1890.



Witnesses:

J. C. Hills.
W. D. Suwall.

Inventor
Charles Spiro.
E. B. Stocking
Attorney

UNITED STATES PATENT OFFICE.

CHARLES SPIRO, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 422,042, dated February 25, 1890.

Application filed May 2, 1888. Serial No. 272,565. (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-Writers, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention has relation to type-writers, and involves improvements of a machine of the character illustrated in my pending application, Serial No. 249,684, and my patents, No. 400,265, dated March 26, 1889, and No. 15 400,716, dated April 2, 1889.

The objects and advantages of the improvements will appear in the following description and the novel features of the invention will be particularly pointed out in 20 the claims.

Referring to the drawings, Figure 1 is a plan of the principal parts of a machine embodying my invention. Fig. 2 is an end elevation of the paper-feed gearing of the carriage. 25 Fig. 3 is a vertical transverse section on the line 3 3 of Fig. 1, the type-bar-supporting plate and carriage being removed. Fig. 4 is a front elevation of the inking-ribbon-spool-operating mechanism, one of the spools being removed and the bed of the machine being shown in section. Fig. 5 is a plan, partly in 30 section, (on line 5 5 of Fig. 3,) of the ribbon-spool-operating devices. Fig. 6 is a perspective of the type-bar bracket. Fig. 7 is a perspective of the margin-regulator. Fig. 8 is a 35 plan (and a partial section) of a type-bar bracket and type-bar mounted therein. Fig. 9 is a modification of the type-bar bracket. Fig. 10 is a central vertical longitudinal section of a portion of the carriage, showing in 40 side elevation the carriage-feed pawls and the throw-off rod. Fig. 11 is a side elevation of the ribbon-spool. Fig. 12 is a section of the same, also illustrating a modification of the means employed for securing the spool 45 on the spool-spindle. Fig. 13 is a perspective of a type-bar-bracket washer. Fig. 14 is a central vertical section of the spring-barrel employed for giving movement to the carriage and of the devices for adjusting the 50 tension of the spring. Fig. 15 is a plan of a series of washers. Figs. 16 and 17 are a side

elevation and plan, respectively, of the carriage-feed pawls and adjacent parts. Fig. 18, Sheet 1, is a perspective of one end of the 55 indicator-scale, and Fig. 19 is a modified spring-adjusting mechanism.

Like numerals refer to similar parts in all the figures.

1 represents the base of the machine, which 60 in this instance is supported upon the legs 2, and is formed with several openings 3, 4, 5, and 6 for the passage therethrough of the connections between the several operative parts arranged beneath and mounted upon it. 65 The opening 6 is closed at the front by a bar 7, secured by screws 8 or otherwise to the front edge of the base and at each corner thereof. The base is provided with an integral upwardly-projecting rib 9, which forms one of 70 the tracks on which the carriage travels. The brackets 10 (also formed integrally with the base) are arranged at each side thereof and serve to support a rod 11, which serves as the companion track for the carriage. Depending 75 brackets 12 (see Fig. 3) are also formed in one piece with and at each side of the base for the reception of the supporting shaft or rod 13 of a universal bail arranged beneath the base. The remaining parts mounted on or 80 depending from the base are made separately therefrom. Only such parts are formed integral as will facilitate and reduce to a minimum the cost of manufacture of the base.

By the construction of base herein de- 85 scribed the finishing of certain parts by hand or machine tools is not impeded, but rather facilitated—as, for example, the rib 9, which requires planing or otherwise dressing to produce a true and level surface, is accessible to 90 the tool of the machine employed in doing this work, and with the aid of a suitable jig to hold the casting the work of drilling the various holes and finishing level surfaces can be accomplished cheaply, rapidly, and accu- 95 rately. The margin-regulator 14 is formed as a separate single casting having lugs 15, by which it is secured to the base, and a series of holes 16 for the reception of a peg 17, which, when not in use, is inserted in a per- 100 forated laterally-disposed lug 18, formed on the regulator. As clearly shown in Fig. 1, the pin 17 may be placed in any one of the holes 16 in the regulator, so as to be in the

path of a portion of the carriage, and thereby to determine the width of the margin of the work to be performed by the machine.

In the rear of the carriage and extending from side to side of the machine is a bar 19, secured to the base by screws 20, and having projecting rearwardly therefrom a series of long and short pins 21 alternately arranged. This series is shown extending but partly across the bar 19, although it is understood that they extend completely across in a completed machine. In like manner the apertures through the type-bar plate 22 are not shown completely across the same, as such showing is not essential to a clear understanding of the invention.

22 represents the type-bar plate as secured upon standards projecting upwardly from the base by means of screws or bolts 23. The plate 22 is apertured on curved lines, as at 23, for the passage therethrough of the connecting wires or ligaments extending from the type-bars to the key-levers, and as at 24, for the reception of the screws 25, which are employed to secure the type-bar brackets 26 to the plate. Between the head of each screw 25 and the upper edges of the type-bar brackets 26 a washer 27 is inserted. Each of the washers (see Fig. 13) is a plate apertured, as at 28, for the passage of the body of a screw, and has its opposite sides 29 tapered on lines radiating from the printing-point of the machine, so that when a number of these washers are arranged upon the type-bar brackets each abuts against those at either side of it, and each is prevented from turning whenever the screw passing therethrough is tightened or loosened in an adjustment of the type-bar bracket—as, for example, when aligning the type. This form of washer can be manufactured at a minimum cost, and each is entirely separable from the others in a series, so that it can be removed without the necessity of disturbing the alignment of the brackets on which adjacent washers are arranged.

The type-bar brackets 26 are each made of sheet metal cut and formed to the shape illustrated in Fig. 6. Each of the upright arms 30 is perforated for the reception of the spindle on which the type-bar is pivotally mounted, and the connecting-bar 31 is bent into U shape, so as to embrace the screw 25, by which the bracket is secured to the bracket-plate. In some instances one of the standards 30 may be dispensed with, as shown in Fig. 9.

The type-bar 32 is apertured for the passage therethrough of a sleeve 33, having shoulder 34, which takes bearing on one side of the type-bar, and a shoulder 35, which is upset to bear on the opposite side of the type-bar, so that the sleeve and type-bar are rigidly connected with each other, and the bearing proper of the type-bar, with the bracket, is thus extended throughout the whole length of the sleeve, as the pin, bolt,

or screw 36 extends through the sleeve and through the standards 30, in which it is secured rigidly.

In the modification illustrated in Fig. 9 the pin, bolt, or screw 36 has a shoulder or head 34, which is brought snugly against one side of the type-bar, and said type-bar is brought snugly against the standard 30 by either riveting or upsetting the pin or bolt against the outside of the standard. In one instance the bearing of the type-bar is extended laterally or lengthwise in the sleeve, and it is extended in the other upon the sides of the type-bar, so that in both instances a bearing is provided which will stand long service and which can be cheaply constructed.

The inking mechanism comprises two spools 37, being each mounted on a spindle 38, seated therein and projecting from a standard 39. The standard is fixed upon the base between the carriage-track 9 and type-bar plate 22. The spindles 38 are disposed at such an angle as to deliver the inking-ribbon 40 angularly across the platen 41 and around the guide-rod 42, supported by a bracket 43, extending from the standard 39. The inking-ribbon then extends from the bar 42 to the other spool 37, so that by rotating either spool the inking-ribbon may be wound thereon and unwound from the companion spool, thus presenting new portions for each impression of a type.

The mechanism employed for giving intermittent movement to the inking-ribbon comprises a ratchet 44, loosely mounted on each spindle, and a double pawl 45, (see Figs. 3 and 4,) secured loosely by means of screw 46 on the end of a link 47, pivotally connected at 48 to a rock-arm 49, secured to the shaft 13, which supports the bail 50, extending along under the series of key-levers of the machine. A coiled or other spring 52 at the joint 48 serves to keep the pawl 45 in contact with guide pins or rods 53, which project upwardly from a plate 54, secured to the lower end of a rod 55, which passes upwardly through the lock-plate standard 39, (see dotted lines, Fig. 3,) and is provided with a handle or thumb-nut 56, whereby the plate 54 may be turned so as to bring the pins 53 against the double pawl 45 in such manner as to throw one of its ends into mesh with one of the ratchets 44. The pin 57 projects from standard 39, so as to be embraced by one of the notches 58, formed in the plate 54, thereby serving to lock the plate in either of the positions it occupies when the plate is in its lowest position.

Each of the spools 37 is provided with a pin 59, which projects laterally sufficiently far to be entered into a hole formed in the ratchet 44, whereby motion given to the ratchet is communicated to the spool. The pin 59 within the sides of the spool may be also used to fasten the end of the inking-ribbon to the spool. In order to produce a frictional contact of the spools with the spindles,

each spool is provided with a spring 60, which is adapted to bear against the spindle. Two forms of friction-producing springs are shown. In one form (see Fig. 11) a latch 60 is pivoted to the side of the spool, as at 61, and has a recess 62, adapted to embrace the spindle back of its head 63, which head may be made by forming an annular groove in the spindle, as shown in Fig. 4, or by inserting a screw into the end of the spindle. The latch 60 is resilient and bent so that in the act of placing it back of the head of the spindle a pressure of the latch against the spindle-head is exerted sufficient to produce the desired frictional connection between the spool and spindle. In Fig. 12 the spring is coiled about the screw 63 and bears against the spool, one end of the spring being secured to the body of the screw, in this instance by passing through the same, as shown at 64, so that when the screw is removed to remove the spool the spring is always retained upon the screw. In this latter construction simply tightening the screw produces the desired friction. Each key-lever is notched, as at 65, (see Fig. 3,) to receive the pivot-bar 66, and is held in position by a coiled spring 67, secured to one of the pins projecting from the bar 19. Guide-pins 68 depend from the plate 7 at the front of the machine, and between each pair of said pins a key-lever passes.

The operation of the inking-spool-rotating devices is as follows: Whenever any key-lever of the series is depressed, the bail 50 is depressed and the curved rock-arm 49 thereon is elevated and carries with it the link 48 and the double pawl mounted thereon. The latter by reason of the pivotal connection of the link and the contact of the pawl with one of the ratchets moves upwardly in a curved path, actuating the ratchet in its upward movement, and travels over the teeth of the ratchet in its downward movement. The frictional connection of the spool with the spindle and positive connection of the spool with the ratchet prevent a backward movement of the ratchet with the pawl in this downward movement; but a further prevention of a backward movement of the ratchet is secured by a spring-detent 69, projecting from plate 54 and bearing against the teeth of the ratchet with which the pawl is in mesh.

The connection of the ink-ribbon-feed mechanism with the key-levers is direct and involves the employment of as few parts as possible, thereby contributing materially to the lightness of touch, and a minimum of depression of each key is secured to produce the various operations required.

In the use of the well-known spring-barrel for feeding the carriage across the machine it has been found advantageous to make provision for regulating the tension of the spring, and thereby to reduce to a minimum the jar of the carriage (when it is stopped after each impression is made) and the wear upon the parts which stop the carriage.

The spring-barrel 70 is connected to the carriage 71 by a cord 72, which is coiled about the spring-barrel and secured thereto. The spring 73 is, as usual, connected at one end to the barrel and at the other (see Fig. 14) to the fixed spindle 74 of the barrel. The spindle has a worm-gear 75 secured thereto, and is seated, preferably, in the plate 76, secured by screws 77 to the base 1, so that the barrel and its adjacent mechanisms can be removed bodily from the machine. A screw 78 is threaded in the end of the spindle and its head bears against the plate 76, or, it may be, against the base 1 when the spindle is seated therein, so as to firmly hold the spindle against rotation.

The worm 79 meshes with the gear 75 and is mounted upon a shaft 80, which terminates in a thumb-nut 81^x, (see Fig. 1,) accessible for the purpose of rotating the worm-gear and spindle in a direction to tighten or loosen the spring therein, as desired.

The mechanism employed for feeding the carriage across the machine for letter and word spacing comprises a rack-bar 81, which is secured to rock-arms 82, extending from the shaft 13 through openings 4 in the bed. The rack-bar extends longitudinally under the carriage 71, to the frame of which are secured the pawls which co-operate with the rack-bar.

By reference to Figs. 10, 16, and 17 it will be seen that through an opening 83, formed in the carriage-frame 71, there project two pawls 84 and 85. Near the opening 83 there is secured to the carriage-frame a plate 86 by screws 87. This plate has a depending bracket 88, on which is pivoted a bell-crank lever 89, which comes against a stop 89^x, the pivot being the screw 90. The lower arm of the lever is slotted for the reception of the pawl 85, which is pivoted to the lever. A spring 91 encircles the pivot 92 of the pawl 85 and is connected with the pawl near its point, the spring having a tendency to keep the tail 92^x of the pawl 84 against the lever 89, the position which it occupies in Figs. 10 and 16. The tail 92^x of the pawl is extended upwardly beyond the pivot 90. The rod 93 extends from the tail of the pawl longitudinally along the frame 71 and through one end thereof, and terminates in a thumb-nut or push-button 94. A coiled spring 95 encircles the rod and abuts against the plate 86, and has a tendency to draw the bent end 96 of the rod away from the tail of the pawl. The pawl 84 is a fixed one, rigidly secured to the edge of the bracket 88. A coiled spring 97 exerts an upward pressure on the arm of the lever 89, so that when not otherwise influenced it is raised from contact with the bed, or, rather, the screw 90^x, and the pivoted pawl 85 is carried one tooth in advance of that occupied by the fixed pawl 84. By depressing the key the rack-bar 81 is thrown from connection with the fixed pawl and into connection with the pivoted pawl, and when entirely free from the

fixed pawl the pivoted pawl yields as the lever 89 swings on its pivot until its arm comes in contact with the adjusting-screw 90^x, or, in the absence of the screw, with the frame 71, and this carries the pivoted pawl back into line with the fixed pawl by the advancement of the carriage (in the direction indicated by the arrow, Fig. 16) through the influence of the spring-barrel.

The importance of the adjusting-screw 90^x can now be understood, in that in manufacturing and fitting the fixed and pivoted pawls to each other and to co-operate with the rack-bar considerable care and skill and nice workmanship, and therefore expense, are required. Any special fitting is obviated by setting the screw 90^x so that the downward movement of the upper arm of the lever 89 is limited to that point which shall bring the movable pawl in line with the fixed pawl. In this manner the cost of manufacture is materially reduced.

The object and purpose of the rod 93 and of extending the pawl 85 to form the tail 92^x thereof are to render the manner of and the means for moving the carriage at will back and forth along its ways as simple and direct as possible. It will be seen that by pushing upon the button 94 the movable pawl is thrown completely out of contact with the rack-bar, which, when no key-lever operates the bail 50, rests directly beneath the movable pawl, (see dotted lines, Fig. 3,) so that the carriage is thus rendered free to move in either direction along its track. This is very convenient in the operation of correcting errors or of tabulating the work with or without using the margin-regulator.

The gearing employed in connection with the feed-rolls and platen of the carriage is so arranged as to permit of the insertion of a practically unlimited number of sheets between the platen 41 and the pressure feed-roller. It sometimes is desirable to print numerous carbon copies, which, together with the original, increases the thickness of the paper between the platen and feed-roller sufficiently to unmesh the gears, if there be any mounted thereon, and, in case there are none, to cause the sheets between the rolls to slip upon each other, and therefore in both cases to produce imperfect work.

In Figs. 1 and 2 the gearing employed is shown, 98 being that secured to the platen and 99 that secured to the pressure feed-roller 100 and the intermediate gears 101, which are mounted on the studs 102, projecting inwardly from the end wall of the carriage-frame. Said wall is shown in dotted lines in Fig. 2, and is slotted, as at 103, for the reception of the journals of the roller 100. Both of the end walls of the carriage are slotted, and the slots are curved concentrically with the lower intermediate gear 101. When a large number of sheets are interposed between the platen and the pressure-roller, the gear of the latter is by the curvature of the slots retained in mesh with the said intermediate gear 101.

Therefore in turning the nut 104 on the shaft of the platen 41 for the purpose of line-feeding force is positively applied at both sides of the paper between the rolls and slipping of intermediate sheets is prevented.

The carriage-frame 71 is provided with lugs 105, which are apertured to embrace the rod 11, while the opposite edge of the carriage-frame is provided with the wheel 106, which rides along the track 9.

In Fig. 19 I illustrate a much simpler arrangement of some of the principal devices employed for adjusting the tension of the carriage-feed spring. In this form the spindle 74 is provided at its lower end, which projects through the plate 76 or the bed 1, with a rigidly-attached gear 75^x, and a pin 79^x projects downwardly from the base 1 between two of the teeth of said gear. A spring-washer 80^x tends to keep the spindle 74 and the barrel mounted thereon elevated and the gear 75^x in contact with the under surface of the base. Now, by simply pressing down upon the upper end of the spindle, thus freeing the gear from the locking-pin 79^x, and then turning the spindle, most conveniently by means of a screw-driver, in either direction, the tension of the spring may be regulated as desired. In this form the pin 79^x performs the same function as the worm 79, in that both serve to hold the spindle after adjustment. This form may be also mounted in a separable plate 76, if desired.

Figs. 1 and 18 show the gage or scale 107, which is formed as a part of or may be attached to the bail 108, mounted in the ends of the carriage-frame. The primary purpose of the bail is to guide the leading edge of the paper over and hold it on the platen. The scale 107 extends along the platen parallel with the line of printing, so that in connection with the pointer 42^x on the ink-ribbon guide or turning bar 42 the carriage may be set to print at any point on the line.

The ratchet-plate 109 on the journal of the bail is to serve with a spring-detent on the carriage-frame (not shown) to hold the bail in position on or off from the platen.

No claim is made in this application to means for the adjustment of the carriage-driving spring herein shown and described, as the same is shown, described, and claimed in my application, Serial No. 302,419, filed March 8, 1889.

What I claim is—

1. The combination, with the ribbon-spools and their ratchets, of a pivoted double pawl and a plate arranged adjacent to the pawl and provided with guide pins or rods, and means for changing the position of the plate to throw the pawl into mesh with one or the other of the ratchets, substantially as specified.

2. The combination, with the inking-ribbon spools and their ratchets, of a pivoted double pawl, a notched plate adjacent to the pawl and adapted to control the position of the

same, and of a fixed projection for locking the plate in a desired position, substantially as specified.

3. In a type-writing machine, the combination, with a ribbon-spool and its shaft, the latter having a head, of a pivoted spring mounted on the side of the spool and recessed near its free end to embrace the shaft intermediate the spool and head, said spring exerting pressure lengthwise of the shaft, substantially as specified.

4. A spool provided with a pivoted spring-latch and a pin extending from wall to wall of the spool and projecting at one side, substantially as specified.

5. The combination, with the ribbon-spools and their ratchets, of a pivoted double pawl, a plate carrying pawl-guides, and detents mounted on a rod provided with means for lifting and turning the plate and to throw the pawl and detent into connection with either ratchet, substantially as specified.

6. The combination, with the type-bar brackets and their attaching-screws, of washers constructed to abut against each other, substantially as specified.

7. The combination, with the platen having a gear, of the pressure feed-roller having a gear and intermediate gears, whereby said platen and pressure-roller may be separated

without disengaging the gears, substantially as specified.

8. The combination, with a carriage-frame having curved slots or bearings for the pressure feed-roller, of said roller and the platen, each provided with a gear, and of intermediate gears journaled on the frame, substantially as specified.

9. A plate adapted to be secured to the frame of a carriage and having a depending bracket, in combination with a vibratory rack and a pawl-carrying lever pivoted to the bracket, a pawl pivoted in the depending arm of the lever, and a fixed pawl secured to the bracket, substantially as specified.

10. The combination, with a vibratory rack, the fixed pawl, and the bell-crank lever carrying the movable pawl, of an adjusting-screw arranged in the path of an arm of the bell-crank lever, substantially as specified.

11. The rack, the fixed pawl, the movable pawl, and its lever, in combination with the carriage-frame provided with an adjusting-screw, substantially as specified.

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

CHARLES SPIRO.

Witnesses:

WILLIAM H. BRACY,
C. W. STUBBINGS.