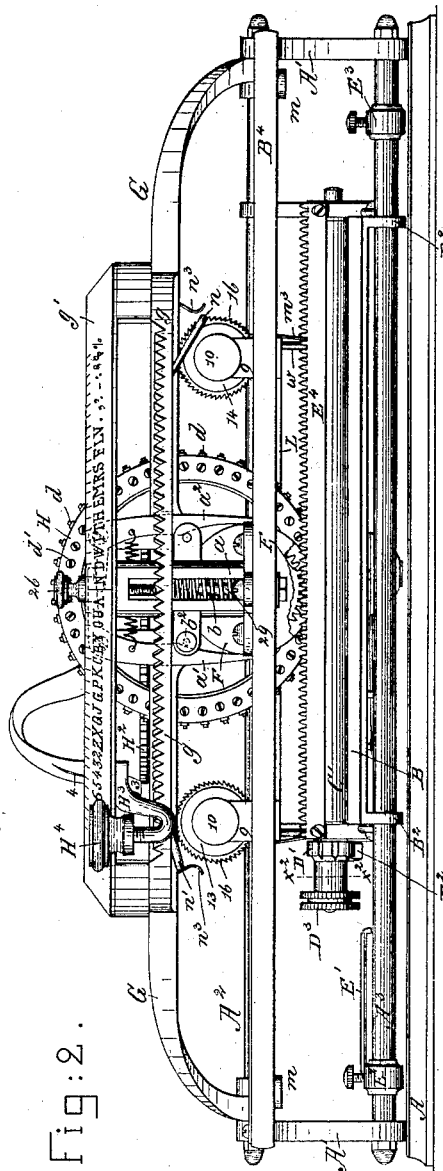


3 Sheets—Sheet 1.

No. 342,302.

Patented May 18, 1886.



Witnesses.  
Arthur Lipperden.  
Henry Maslow.

Inventor.  
Daniel E. Kempster.  
by Crosby & Gregory Attys

(No Model.)

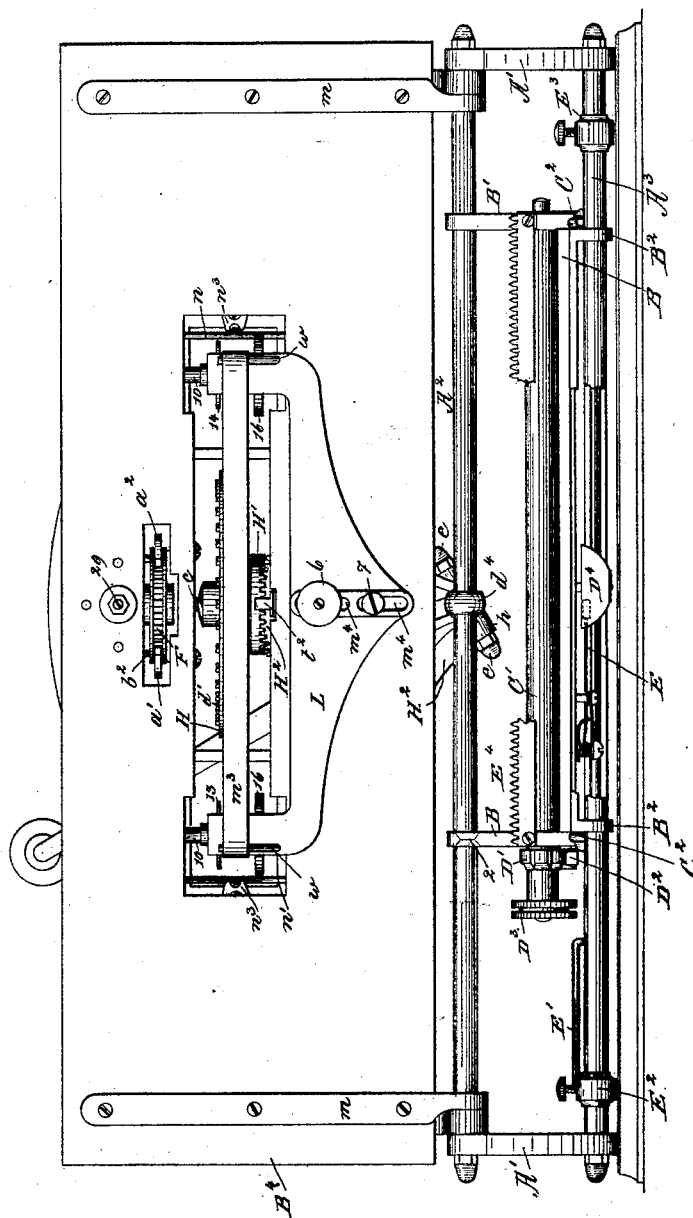
3 Sheets—Sheet 2.

D. E. KEMPSTER.  
TYPE WRITING MACHINE.

No. 342,302.

Patented May 18, 1886.

Fig:3.



Witnesses.

*Arthur Lippert.*

*Henry March.*

Inventor.

*Daniel E. Kempster.*

*by Henry Strong, Atty.*

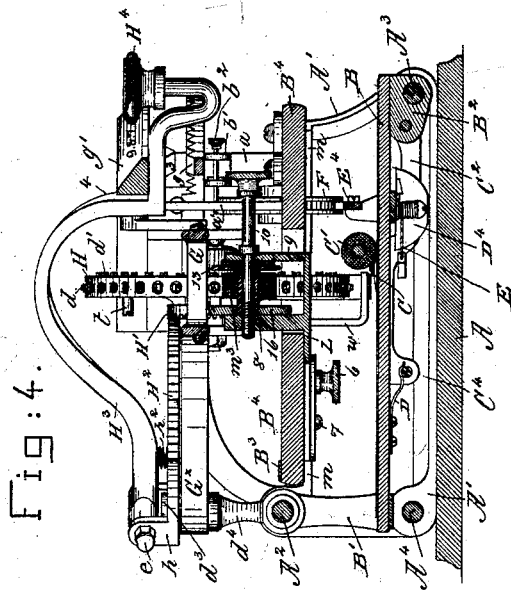
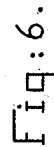
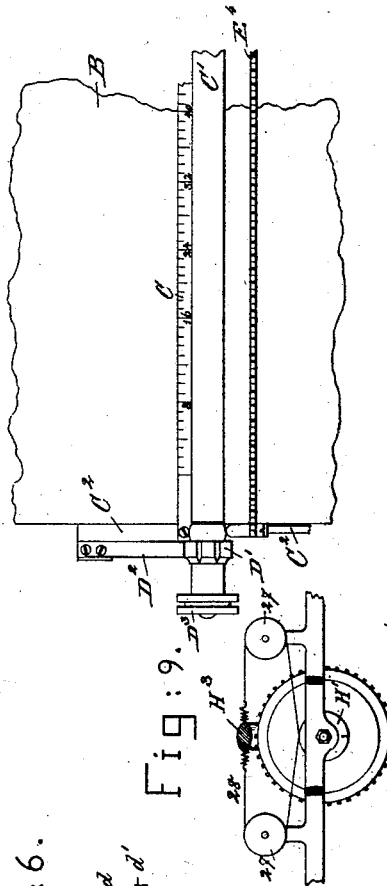
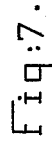
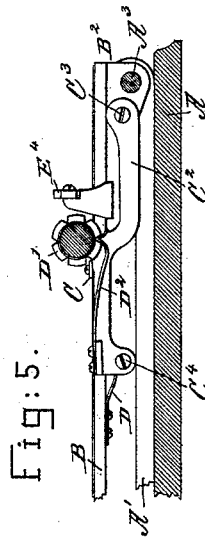
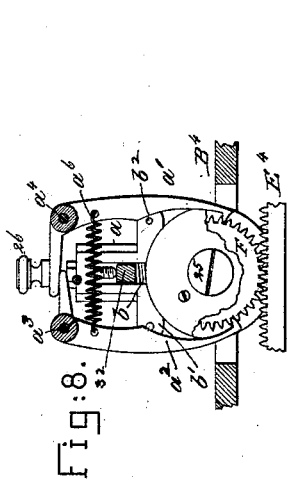
(No Model.)

3 Sheets—Sheet 3.

D. E. KEMPSTER.  
TYPE WRITING MACHINE.

No. 342,302.

Patented May 18, 1886.



Witnesses.

Arthur Lippert.  
Henry Marsh.

Inventor.

Daniel E. Kempster  
by Crosby & Gregory Attys.

# UNITED STATES PATENT OFFICE.

DANIEL E. KEMPSTER, OF BOSTON, MASSACHUSETTS.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 342,302, dated May 18, 1886.

Application filed June 11, 1884. Serial No. 134,503. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL E. KEMPSTER, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Type-Writing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object the production of a simple and efficient type-writer in which the printing may readily be inspected.

In this my invention the paper-carrier is made laterally movable on guides, and above the said carrier is pivoted the frame which carries the type-wheel, the mechanism for moving it, and the mechanism which moves the feed-wheel that actuates the paper-carrier, and also the mechanism which operates the ink-ribbon. This pivoted frame is made to resemble a yoke, and the type-wheel mounted therein has at its axis a small crown or other suitable gear, which is engaged by the teeth of a pivoted toothed sector having hinged to or made movable with it the operating-lever, or the lever which is engaged by the operator, and moved into position opposite the letter or character on the index-plate, which letter or character is the same as that which it is desired to imprint upon the paper. The operating-lever, besides being free to be moved horizontally, is also free to rise and fall a limited distance in a throat, one part of which is provided with a series of letters or characters, thus constituting an index-plate, while the other part is provided with correspondingly-placed notches or projections, so that vertical movement of the operating-lever at the termination of the horizontal movement thereof enables the said lever to be locked in place to maintain the type-wheel in such proper position as to cause the said type-wheel to act upon the ink-ribbon and print upon the paper laid upon the paper-carrier a letter corresponding with that on the index-plate opposite which the said lever is temporarily locked by its vertical movement. I have interposed a top plate between the paper-carrier and the pivoted frame referred to, and upon this top plate I have adjustably attached the ink-ribbon holder.

The particular features in which my inven-

tion consist will be pointed out in the claims at the end of this specification.

Figure 1 is a top view of a type-writer embodying my improvements; Fig. 2, a front elevation thereof. Fig. 3 is a front elevation with the pivoted frame and top plate elevated ninety degrees, the feed-rack on the paper-carrier being broken away to show the paper-feeding roller back of it. Fig. 4 is a section of Fig. 1 in the dotted line  $x x$ , the knob  $H^1$  being, however, in elevation; Fig. 5, a sectional detail looking at the paper-carrier from the left of the dotted line  $x^2 x^2$ , Fig. 2. Fig. 6 is a sectional detail of the type-wheel, showing one of the type held therein by a set-screw; Fig. 7, a partial top view of the paper-carrier; Fig. 8, a sectional detail in the line  $x^2 x^2$ , Fig. 1, the feed-wheel being broken out; and Fig. 9 a modification to be referred to.

The base  $A$  has rising from it end brackets,  $A'$ , which form bearings for rods  $A^2 A^3 A^4$ , the rods  $A^2 A^3$  serving as the guides for the paper-carrier  $B$ . This paper carrier or "carriage," as it might be called, is shown as a plate, and at its rear side the carrier has two upwardly-extended arms,  $B'$ , provided with holes, through which is extended the guide-rod  $A^2$ , while at its front end the carrier has at its lower side two lugs or ears,  $B^2$ , which embrace the guide-rod  $A^2$ . One of the arms  $B'$  (see Fig. 1) has a pointer, 2, which co-operates with the carriage-positioning scale  $B^3$  on the top plate,  $B^1$ .

The paper-carrier  $B$  has a correspondingly-graduated scale,  $C$ , connected with it at the rear of the paper-feeding roller  $C'$ , (see Fig. 7,) and in such position that its rear edge falls as a straight edge just below the line being printed. In case of a wrong letter being inserted the operator will remove the same, and will notice the point where the letter was erased with relation to the scale  $C$ , and will then move the paper-carrier until the pointer 2, referred to, is opposite a number or line on the positioning-scale  $B^3$  which corresponds with the mark or number on the scale  $C$  opposite the point where the erasure referred to was made. Such operation insures the placing of the paper-carrier at exactly the position which it is necessary that the said carrier should have to enable a letter to be printed at a particular point in the line, or to enable

a line to be started at any desired point with relation to its length. The feeding-roller has its journals mounted in suitable ears of a roller-carrying frame, C<sup>2</sup>, (see Fig. 5,) pivoted to the paper-carrier at C<sup>1</sup>. The outer end of the roller-carrying frame C<sup>2</sup> has a screw-rod, C<sup>3</sup>, which is acted upon at its upper side by a spring, D, which latter serves to maintain the feeding-roller C<sup>1</sup> bearing upon the paper on the paper-carrier with a yielding pressure, enabling several sheets, if desired, to be kept under the said roller for manifold printing.

The paper-feeding roller herein shown has the main part of its body covered by means of an india-rubber shell, as best shown in the section, Fig. 4, and outside the bearings for the said roller it is provided with a ratchet-wheel, D<sup>1</sup>, (see Figs. 3 and 5,) which is engaged by a spring-detent, D<sup>2</sup>, the said roller having at its end a milled or other head, D<sup>3</sup>, which is engaged by the operator after printing each line, and is rotated to feed the paper away from the operator and on the paper-carrier for the distance of one line, the notches in the ratchet-wheel D<sup>1</sup> being made at suitable distance apart to insure as many different steps or partial rotations of the paper during each complete rotation of the said roller as there are notches in the wheel D<sup>1</sup>. Each step or partial rotation of the said wheel effects the spacing or the distance between lines.

At its underside the paper-carrier has fastened to it a bell, D<sup>4</sup>, and a spring-arm, E, carrying a hammer. As the paper-carrier arrives at the end of its traverse toward the left to complete a line, the spring-arm E strikes the bent end of an arm, E<sup>1</sup>, connected with an adjustable stop, E<sup>2</sup>, mounted on the guide-rod A<sup>3</sup>. This arm E<sup>1</sup> (see its shape indicated in dotted lines, Fig. 1,) acts to lift the spring-hammer E, and just before the ear B<sup>2</sup> reaches the said stop the spring-hammer slips from the end of the arm E<sup>1</sup> and the hammer strikes the bell, sounding an alarm, which gives notice to the operator that the end of the line has been reached. This stop and arm E<sup>1</sup> may be adjusted on the guide A<sup>3</sup>, to permit the use of paper of any desired width, or to enable shorter or longer lines to be printed upon the paper being used.

The movement of the paper-carrier to the right preparatory to commencing a new line will be determined by the adjustable stop E<sup>2</sup>.

The paper-carrier has a toothed rack, E<sup>3</sup>, under which the paper is free to be moved. This rack is arranged transversely of the paper-carrier, and is engaged by a toothed feed-wheel, F, (shown in Figs. 2, 8, and 4,) which is free to rotate on a stud, 25, held in or by the upright a, the teeth of the said wheel F being cut into a peripheral channel, which forms guides for the hooked pawl a<sup>1</sup> and the detent a<sup>2</sup>, each made as an elbow-lever and pivoted, respectively, at a<sup>3</sup> a<sup>4</sup> on a part, a<sup>5</sup>, of the pivoted frame G, the pawl and detent being held toward each other by the spring a<sup>6</sup>. The short arm of the pawl a<sup>1</sup> has a knob, 26, upon which

the operator will press when it is desired to throw the said pawl out of engagement with the wheel F to move the paper-carrier by hand, such movement of the pawl also causing the detent a<sup>2</sup> to be thrown out of engagement with the said wheel. During the upward movement of the frame G, caused by the spring b, held in the upright a, the pawl a<sup>1</sup> engages and turns the wheel F the distance of one tooth, to effect the regular spacing of the letters of the line, provided the pin b<sup>2</sup>, held in suitable ears, b<sup>1</sup>, of the upright a, is pushed in and rests in the line of movement of the said pawl; but in case the said pin is pulled out, so as to be out of range of the said pawl, then the pawl in its upward movement sooner engages the teeth of the wheel F and effects the rotation of the latter for a distance equal to two teeth, such extra movement being desirable to insure extra width of spacing, as for backing envelopes, &c.

The frame-work G (shown as a metal yoke pivoted upon the guide-rod A<sup>3</sup>) has suitable adjustable pointed bearings, c, made as screws, and commonly used in sewing and other machines. These screws c c (shown in Figs. 1 and 3) are in practice made adjustable, so as to adjust the type-wheel H and keep the teeth of its connected gear H<sup>1</sup> in proper engagement with the teeth of the vibrating toothed sector H<sup>2</sup> and avoid backlash.

The wheel H is provided with radial recesses (see Fig. 6) for the reception of the stems of ordinary metal type, d, the latter being secured therein singly by screws d<sup>1</sup>, such type being thus readily made changeable to permit the use of type of any desired style or font, and in case a type is broken or injured another one may be readily applied instead of it, and without disturbing any of the other type.

Heretofore type-wheels have been provided with type all held by one clamp in such manner that the removal of one was liable to loosen all the others.

The arm or sector H<sup>2</sup> (see Figs. 1 to 4) is pivoted on a screw, d<sup>2</sup>, extended through a backwardly-extended portion, G<sup>x</sup>, of the pivoted frame G, and secured in a standard, d<sup>3</sup>, mounted loosely upon the guide-rod A<sup>3</sup>. The yoke h of the sector receives a bolt, e, which serves as a pivot for the operating-lever H<sup>3</sup>, bent, as shown in Fig. 4, and provided with a knob, H<sup>4</sup>, which is engaged by the operator. The frame G has a curved ledge or portion, g, which is notched or serrated, as shown in Fig. 2, one notch for each letter or character of the wheel. Above this sector-shaped ledge or portion g is an index-plate, g<sup>1</sup>, the face of which is herein shown as inclined downward, so that the letters and characters therein may be readily seen by the operator sitting in front of the machine, thus obviating the trouble of the operator bending over forward and looking down on the index-plate, as heretofore done.

Between the index-plate g<sup>1</sup> and the ledge or portion g is a space which I call a "throat," and the operating-lever H<sup>3</sup> is passed through this

throat, as shown in Figs. 1, 2, and 4, and the said lever is free to rise and fall or turn on its pivot for a distance measured by the width of the said throat. The lever  $H^3$  is normally elevated by the spring  $h^2$ , and the under side of the index-plate serves as an up-stop for the said lever, and at its under side the said lever has a V or other suitable shaped projection, 3, which, at each descent of the lever  $H^3$ , enters one of the spaces in the ledge or portion  $g$ , thus holding the lever accurately in a certain position, and placing the type-wheel in such position as to insure that a type in the wheel corresponding with the character on the index-plate opposite the pointer 4 of the lever  $H^3$  will be brought by the wheel in proper position to imprint its letter on the paper at that descent of the frame G, the operator effecting the descent of the said frame and the type-wheel by a further downward movement or depression of the lever  $H^3$  after the projection 3 of the said lever comes to a seat in the notch referred to of the ledge or portion  $g$ . The guide-rod  $A^2$  has loosely pivoted upon it two arms,  $m$   $m$ , (see Fig. 3,) which have screwed to them the top plate,  $B^1$ , preferably a piece of wood, and, as herein shown, the top plate serves to support the ink-ribbon spool-holder L, (shown best in Fig. 3,) adjustably connected with the under side of the said top plate,  $B^1$ , by screws 6 7, so that the said holder may be readily detached from the machine when it is desired to apply a new ink-ribbon,  $m^3$ , the slots  $m^4$  permitting lateral adjustment of the ribbon, so that its entire width may be used. This holder L has ears 8 9, which receive the spool-spindles 10, screw-threaded at their outer ends to engage threads in the ears 8, and having collars 12 fast thereon, which, by turning the said spindles to screw them into ears 8, causes the said collars to be forced against the outer sides of the ears 9, thus compelling the said ears 8 and 9 to approach each other, and at their inner sides to bear upon friction-washers placed at the end of spools 14, thus holding the latter frictionally, a washer, 15, being interposed between each ear 9 and the said spool. Each spool has a ratchet, 16, which is engaged by bail-shaped pawls  $n$   $n'$ , one or the other of which in engagement with one or other of the ratchets  $g$  of the spools enables the ink-ribbon to be wound, as may be desired, from either spool to the other. The pawl not in use will be held by a suitable spring,  $n^2$ , as at the left of Fig. 2. These pawls are pivotally connected with the frame G.

It will be noticed that the operating-lever  $H^3$  is extended forward over the sector or arm  $H^2$  and toward the operator, and to do this and enable it to cross and not interfere with the type-wheel the said lever is bent or curved upward, as fully shown in Fig. 4, and by so doing I am enabled to greatly reduce the width of the apparatus, and yet insure the proper amount of throw for the lever, and it will be noticed that as the lever  $H^3$  is always below

the index-plate the view of the latter is never obstructed, and it will also be noticed that the operative handle is also vibrated horizontally above the paper-carrier, and, also, it will be noticed that owing to the fact that the frame G is pivoted at its rear side, and at a point substantially in line with the paper-carrier the said frame, with all its attached parts and ink-ribbon, may be lifted and tipped back about the guide-rod  $A^2$ , to expose the paper-carrier and paper, enabling the operator to readily see the line upon which he is working, as well as all the printing upon the page, which is a matter of very great convenience. This frame and top plate may be instantly turned up whenever desired from the frame  $A^1$ , on which it rests, and without removing any fastenings.

The type-wheel is provided at its rear side with a space-pin,  $t$ , which, when the pointer 4 of the lever  $H^3$  is in line with the center line,  $t'$ , of the index-plate, is at the lower side of the wheel T, directly above the foot or right-angled projection of the bracket  $t^2$ , attached to the top plate,  $B^1$ , the said foot arresting the descent of the wheel, so that the type will not force the ink-ribbon upon the paper, but will enable the frame G to descend far enough to insure the operation of the pawl  $a'$  on the wheel F to move the paper-carrier sufficiently to insure a space between words. The ink-ribbon below the under side of the top plate is passed over the rests  $w$ .

In the drawings, Fig. 1, I have shown a segment provided with teeth to engage the series of teeth of the wheel  $H^1$ , operated by the lever  $H^3$ ; but instead of employing the segment and gear I may employ a cord or band, 28, connected at its ends directly to the operating-lever, passing over pulleys 27, and wound once around the wheel  $H^1$ , and preferably attached thereto, as shown in Fig. 9, the said cord or band being the well-known equivalent for the gears.

The adjusting-screw 29, (see Figs. 2 and 3,) placed in the foot of the upright casting  $a$ , may be raised and lowered to serve as a stop, against which a narrow bar or projection, 32, on the main frame G, (see Figs. 1 and 8,) and passed through the slot in the casting  $a$ , strikes as the frame G is depressed to cause the type-wheel to act upon the ink-ribbon. This screw will be adjusted or placed at such height that the descent of the frame will be arrested just as the type upon the type-wheel strikes the ink-ribbon with sufficient force to print a character upon the paper, this screw preventing the metal type, which are usually soft, from being battered down or injured, as they might be if the blow of the type upon the ink-ribbon or the paper below it was too hard.

I can dispense with the ink-ribbon, and in place thereof use suitable inking-rolls attached to the frame G at each side of the printing-wheel, said inking-rolls being of different colors, if desired.

I claim—

1. In a type-writer, the pivoted top plate, combined with the ink-ribbon holder and its

spools, and spindles to hold the spools, the said holder being adjustably and detachably secured to the said top plate, to enable it to be adjusted thereon or to be quickly removed therefrom, as may be desired, substantially as described.

2. The type-wheel, the pivoted frame upon which it is mounted, a pawl carried by said frame, and a pivoted top plate, and the feed-wheel mounted upon the latter pivoted plate, combined with the paper-carrier, its attached rack, and the guide for the said paper-carrier, the latter being fed along laterally by the said feed-wheel in engagement with the said rack, the longitudinal axis of the pivots of the said frame and top plate being parallel with the line being printed, to operate substantially as described.

3. In a type-writer, the pivoted frame G, having the axial centers of its pivots parallel to the line being printed, and provided with an index-plate and notched flange *g* below it, both of which are situated at the extreme or free end of said frame farthest from its pivot-centers, a type-wheel mounted on the said frame between said index-plate and the frame-pivots, and having its axis of rotation at right angles to the axial centers of the pivots of the said frame, and provided with an operating-lever, and the mechanism, substantially as described, whereby a rotary and a vibrating movement may be given to said type-wheel, combined and arranged substantially as described, and for the purpose set forth.

4. The paper-carrier provided with the toothed rack and the top plate and feed-wheel F, combined with the pivoted frame, its connected pawl, and with a pin to co-operate with the said pawl and enable it to engage and operate the said wheel a distance equal to one or two teeth, as desired, substantially as described.

5. In a type-writer, in combination, the pivoted frame G, the ribbon-feeding pawls, the paper-carrier feeding-pawls, the pivoted top plate, the ink-ribbon holder, and its spools and spindles, the feed-wheel, the paper-carrier, the rack and feed-roll thereon, the carrier guide-rod, the type-wheel, the type-wheel gear and sector, and the operating-lever and index-plate, all substantially as shown and described.

6. In a type-writer, the friction-adjusting ink-ribbon holder, consisting of the plate L, provided with two sets of ears, 8 9, screw-threaded spindles screwed into the ears 8 and 9, having shoulders 12, combined with two spools placed on the said spindles between the said pairs of ears, and adapted to be frictionally held from revolving by turning the screw-spindles, and thus clamping said spools between the ears, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DANIEL E. KEMPSTER.

Witnesses:

JOS. P. LIVERMORE,  
G. W. GREGORY.