

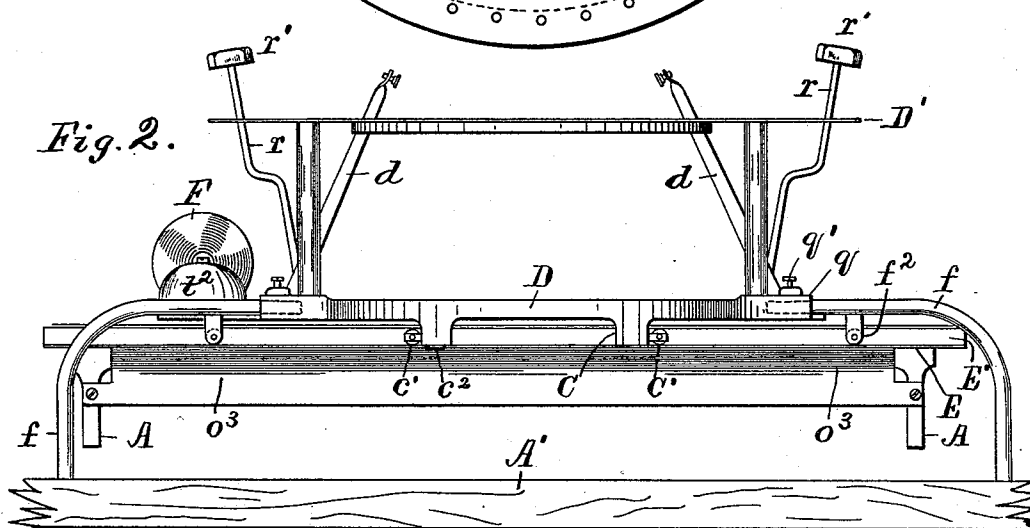
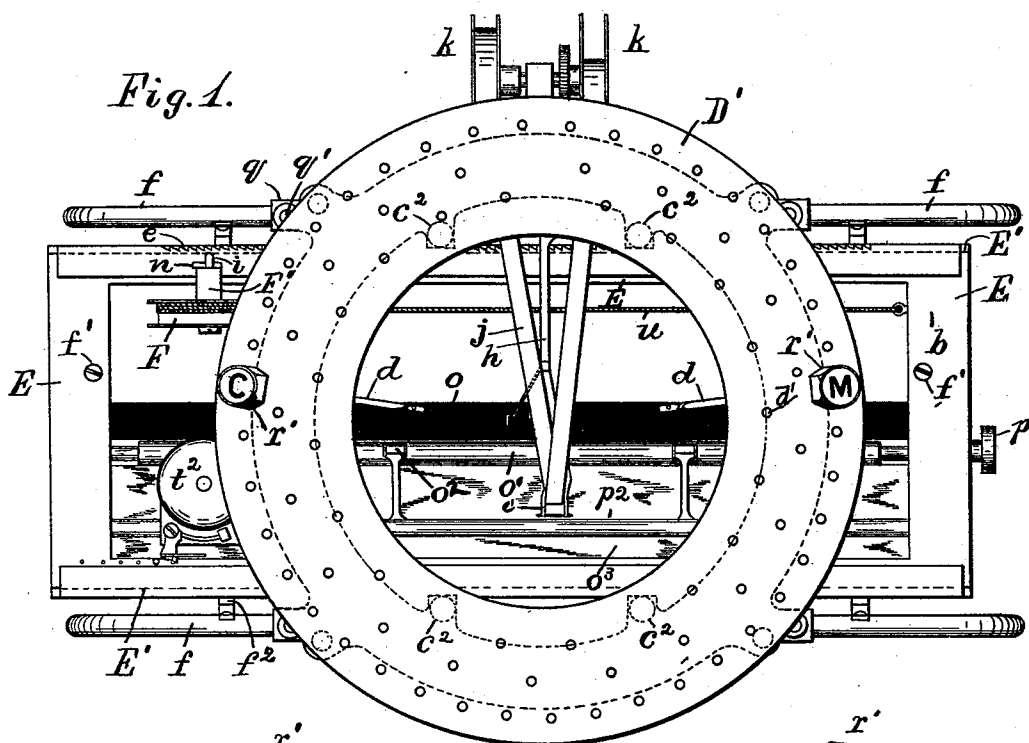
(No Model.)

3 Sheets—Sheet 1.

J. M. CRARY.
TYPE WRITING MACHINE.

No. 477,404.

Patented June 21, 1892.



Attest:
J. Van Hook Jr.
Clerk. J. Kinsey

Inventor.
J. M. Crary, per
Crane & Miller, Attys.

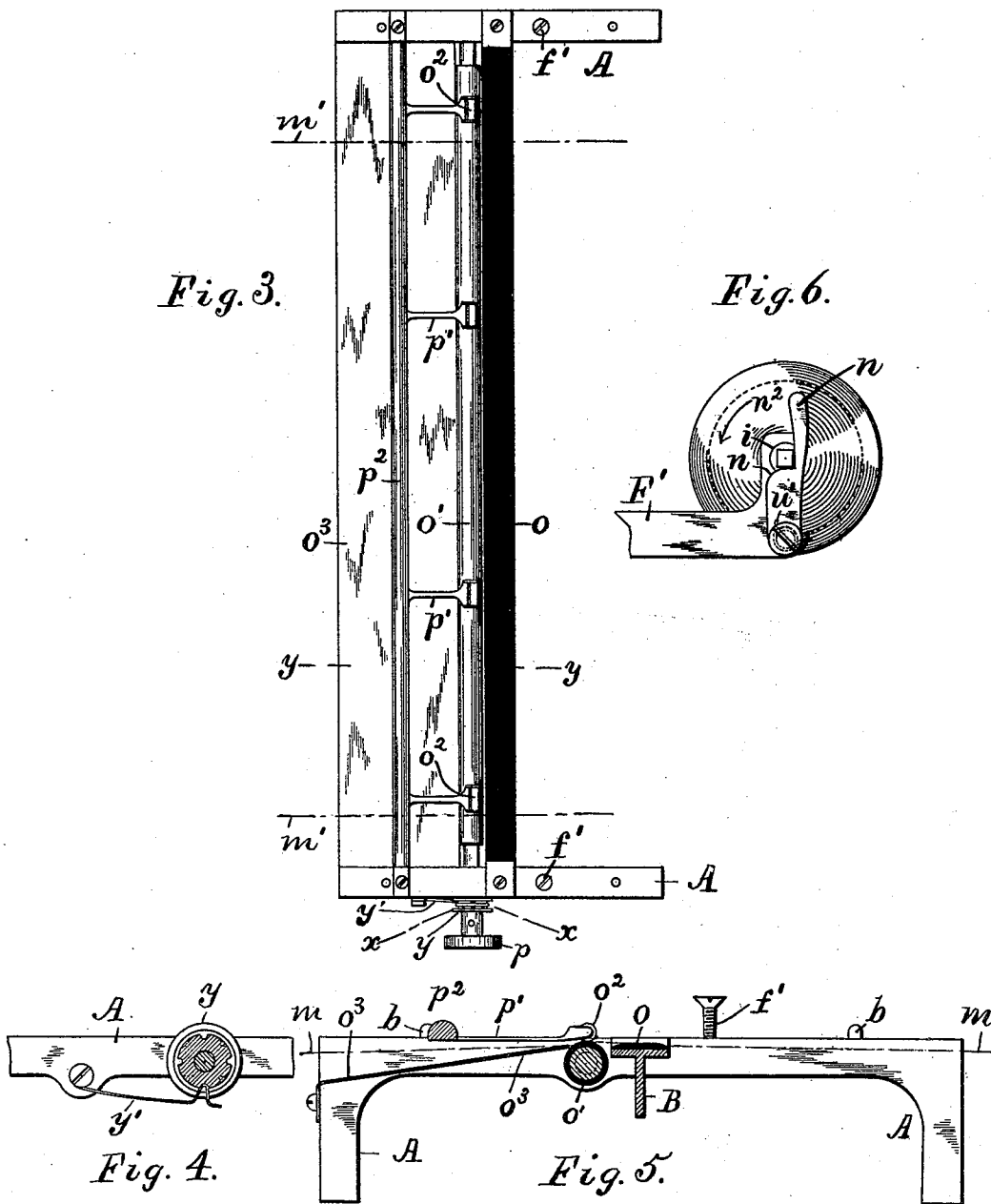
J. M. CRARY.
TYPE WRITING MACHINE.

No. 477,404.

Patented June 21, 1892.

Fig. 3.

Fig. 6.



Attest:
J. Van Stet J.
Edw. C. Kinsey

Inventor.
J. M. Crary, per
Crane & Miller, Attys.

J. M. CRARY.
TYPE WRITING MACHINE.

No. 477,404.

Patented June 21, 1892.

Fig. 7.

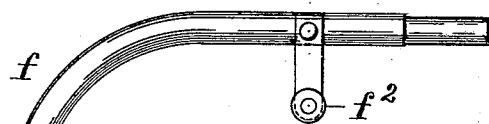


Fig. 8.

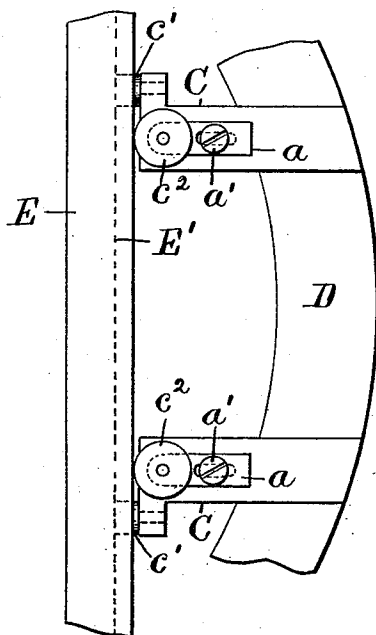


Fig. 9.

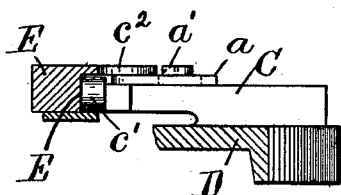


Fig. 10.

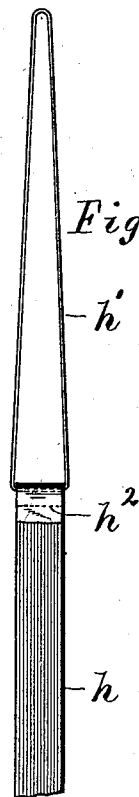


Fig. 11.

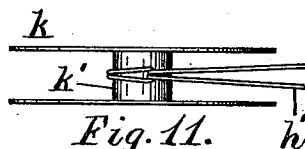
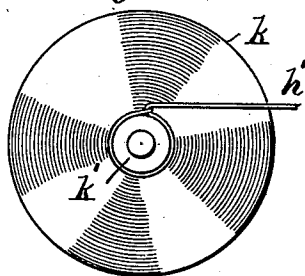


Fig. 12.



Attest:
J. Vanhook Jr.
Edw. Kinsey

Inventor.
J. M. Crary, per
Crane & Miller, Atty.

UNITED STATES PATENT OFFICE.

JOSEPH M. CRARY, OF JERSEY CITY, NEW JERSEY.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 477,404, dated June 21, 1892.

Application filed December 28, 1891. Serial No. 416,350. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. CRARY, a citizen of the United States, residing at Jersey City, Hudson county, New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to a type-writing machine having a type mechanism fitted movably to a carriage provided with paper-feeding devices; and it consists, partly, in the provision of legs or feet to hold either the carriage or type mechanism stationary in relation to the other, partly in the combination, with the carriage and the type mechanism movable thereon, of a supporting-frame (having paper-feeding devices) attached removably to the carriage, and partly in the combination and arrangement of a strip-platen with the paper-feeding devices and in other details of construction hereinafter set forth and claimed.

The invention will be understood by reference to the annexed drawings, in which Figure 1 is a plan of the entire apparatus. Fig. 2 is a front elevation, the type-bars and keys being in great part omitted, as they would obscure the present improvements. Fig. 3 is a plan of the stand for the paper-feeding devices. Fig. 4 is an end elevation, upon a larger scale, of the spacing-pawl and ratchet, the ratchet being shown in section on line *xx* in Fig. 3. Fig. 5 is a section of the stand upon the same enlarged scale on line *yy* in Fig. 3. Fig. 6 is a rear elevation of the spring-drum *F* with its bearing and the pawl for locking the spindle. Fig. 7 shows the inner side of the detachable leg *f*. Figs. 8 and 9 are drawn upon the same enlarged scale, Fig. 8 showing the under side of a portion of the carriage and its attachment to the type mechanism and Fig. 9 showing an end view of the guide and gib by which said parts are fitted movably together. Fig. 10 shows a ribbon end with looped cord attached; Fig. 11, a plan of the spool with the cord hitched thereon, and Fig. 12 a side view of the same with one flange removed.

The type mechanism may be made of any preferred design, that shown herein being the same as is illustrated in my application, Se-

rial No. 376,606, filed January 3, 1891, in which an annular plate *D* is employed to sustain the pivots of the type-bars, and the key-rods for the type-bars are sustained above the same by an annular plate *D'*. Only two of the type-bars *d* are shown with their key-rods *r*, the hole *d'* in the plate *D'* showing where the remainder of the rods would be inserted. The type-bars strike downward upon a platen below the plate *D*.

The plate *D*, as shown in Figs. 1 and 8, is provided with projections or guides *C*, fitted to grooves *E'* in the opposite edges of the carriage *E*. The guides are formed with rolls *c'*, fitted in the groove to diminish the friction, and rolls *c''* are also attached to the guides to bear upon the edges of the carriage. Two of the latter rolls are pivoted upon adjustable feet *a*, provided with clamp-screws *a'*, by which the rolls may be set toward the edge of the carriage *E* to compensate for lost motion, as shown in Figs. 8 and 9. Such adjustable rolls may be called "roll-gibs," because they serve as gibbs to fit the type mechanism movably upon the carriage with the least possible play, and thus secure the most perfect alignment of the type-impressions.

F is the spring-drum for shifting the type mechanism upon the carriage by means of the usual cord *u*, the drum being provided with the usual spring-winding spindle *i*, which is mounted in a bearing *F'*, attached to the plate *D*. The end of the spindle, as shown in Figs. 1 and 6, is squared and locked by a pivoted arm *n*, having a rectangular notch adjacent to one corner of the spindle. The side of the notch, where it extends past the adjacent corner of the spindle, is rounded off, as shown at *n'* in Fig. 6, and the arm is pressed toward the spindle by a spring *u'*, applied to its pivot. With this construction a wrench or key may be applied to the square of the spindle to wind it up, (in the direction indicated by the arrow *n''*), and the arm then operates as an automatic locking device, which is pushed out of the way by the corners of the spindle when rotated in the direction of the arrow and engaged by the notch in the arm *n* when it begins to turn in the opposite direction.

Ribbon-spools *k* and a ribbon-guide *e'* are shown in Fig. 1 with the ribbon *j* extending between the same, and the type-bars operate

in practice, when pressed by the keys r' , to press each type upon the ribbon in the center of the plate D. The spacing-lever h would by suitable mechanism be vibrated by each type-impression or movement of the type-keys, and is provided in practice with a pawl to operate upon a rack e on the edge of the carriage E. The operation of these parts, as well as of the spring-drum F and the bell l^2 , (shown in Fig. 1.) are already well known.

The under side of the carriage is adapted to fit upon the stand shown in Figs. 3 to 7, inclusive, the under side of the carriage being provided with holes to fit steady-pins b upon the stand, so as to set the parts in their proper relation. The carriage and stand may be secured together, if desired, by screws f' . (Shown in Figs. 5 and 1.) The stand consists in foot-pieces A, attached together by a T-bar B, upon the top of which is secured a flat-strip platen o . A feed-roll o' is journaled in bearings in the foot-pieces close to the edge of the strip-platen, and several independent rolls o^2 are pressed upon the top of the same by separate springs p' , which are attached to a common support or bar p^2 . This bar is extended between the frames parallel with the platen, and the springs p' are secured at one end to the bar and are forked at the other end to receive the pivots of the independent rolls o^2 . The roll o' is covered with india-rubber or other yielding material and the platen o is formed of similar substance, both being shown in solid black upon the drawings; but the rolls o' may be made merely of metal and are preferably made quite small.

Beneath the springs p' a shelf or table o^3 is provided to guide the paper between the rolls o' and o^2 and the paper is set parallel with the platen whenever its forward edge is in contact with two of the rolls o^2 .

The roll o' is furnished at one end with a knob p to turn the roll, and its rotation operates to draw the paper in between the rolls and to project it over the platen. The rolls set so close to the edge of the platen, upon which the type-impressions fall, that the paper may be printed very close to its rear edge, while the front edge may be set to receive the impressions as close to the margin as is desired.

The knob p is furnished with a gage-wheel y , having two sets of notches v therein at different distances from one another. These notches are formed in two adjacent grooves, and a wire spring-catch y' is attached to the foot-piece and fitted to bear in either of the grooves at pleasure, by which the movement may be gaged to constitute a line-spacing mechanism and make a larger or smaller space upon the paper when the roll is turned.

The plate D, carrying the type mechanism, is moved longitudinally over the strip-platen o , the type-impressions falling upon the platen at different points as the plate is advanced by the spring-drum and pawl c , operating in the feed-rack e . When the type mechanism

has moved to one end of its stroke, the pawl may be released from the rack by any well-known means and the type mechanism moved to the opposite end of the carriage to print an adjacent line. After such readjustment of the type mechanism the paper-roll o' is turned by the knob p , and the paper is thus drawn across the platen a suitable space.

A sheet of paper is indicated by dotted lines m in Fig. 3, and a dotted line m' is shown in Fig. 5 to exhibit the movement of the paper over the platen o and between the paper-feeding rolls o' and o^2 .

In my application, Serial No. 411,773, filed November 13, 1891, I have shown and claimed a type mechanism and carriage adapted to operate in a bed-frame over heavy books, and my present invention is designed to utilize such type mechanism and carriage for printing upon loose pieces of paper, for which purpose the stand is adapted by the pins b for attachment beneath the carriage in the proper relations to fit the paper.

When the carriage has been used for printing on a book, it cannot thereafter be applied to the stand in exactly the proper relation to the platen o and paper-feeding rolls o' and o^2 , unless it is guided by some means into exactly the proper position upon the stand. Such adjustment is furnished by the pins b or by the screw f' , and the adjustment is thus readily effected when the stand is resting upon the foot-pieces A.

When the carriage E and stand A are secured together, it is obvious that either the type mechanism or the stand may be held stationary and the other moved in relation thereto by the feed-pawl. To adapt the apparatus for use in this manner, I provide detachable legs for the plate D, which legs are made longer than the foot-pieces A to hold the type mechanism stationary with the paper-feeding mechanism suspended beneath it. The legs are shown herein as bent bars f , secured, removably, in sockets q upon the plate D by set-screws q' .

To afford the carriage a support when traversed movably beneath the type mechanism, the bars are extended parallel with the grooves E' and then bent downward, thus providing means for attaching auxiliary rolls f^2 , which are fitted to the parallel grooves E' several inches outside of the rolls c' . By means of such auxiliary rolls the carriage is held steady and in perfect alignment when suspended from the plate D and traversed through its entire stroke beneath the type mechanism.

The legs are shown in Fig. 2 resting upon a table A' and supporting the carriage and stand A clear of the table, so that the operation of the feed-pawl upon the rack e moves the carriage and stand beneath the type mechanism. With this arrangement the type-keys, guided by the plate D' , are held in the same position during the use of the machine. By removing the legs f from the sockets q the foot-pieces A rest upon the table, and the ap-

paratus is then used, with the carriage and stand stationary, while the type mechanism moves thereon.

The apparatus is by the use of the removable legs adapted, therefore, for use in two entirely-different modes, with either the type mechanism or the carriage movable in relation to the other element.

The stand is shown with foot-pieces; but such feet are not essential, as the foot-pieces themselves or the entire stand may be constructed in any convenient form to rest upon a flat surface when supporting the type mechanism movably.

The construction shown for the stand is a very cheap and simple one, consisting, merely, in the two foot-pieces A and the T-bar B; but other forms may obviously be devised.

When the carriage and the stand are united together, the flat platen *o* and the line-spacing devices obviously move with the carriage and form an attachment of the same as effectually as if the construction were integral.

The independent operation of the rolls *o*² is a very great advantage in the operation of the paper-feeding and line-spacing devices, as it secures the firm grip of the paper-feeding roll *o*¹ upon the paper at its contact with each of the rolls *o*², and thus enables the feeding-roll to operate upon sheets of paper of different widths with equal certainty.

Where two long rolls are pressed together, it is very common for them to yield in the middle or for them to press unequally upon the paper at opposite ends, and pieces of paper of various widths are thus liable to slip at one edge or the other when moved forward by the line-spacing mechanism and the lines thus vary from strict parallelism.

The means I employ in the independent rolls *o*² for pressing the paper upon the feeding-roll secures a parallel movement of the paper, whether it be a wide sheet resting upon the whole length of the feeding-roll or a postal-card or small piece adapted to engage only two of the pressing-rolls *o*².

The type mechanism and the carriage E upon which it is moved longitudinally by the usual pawl acting on the rack *e* are adapted for making a single line of printing upon any flat surface by setting the carriage (independent of the stand) directly upon such surface. To fit the carriage for such a use a flat joint is provided between the stand and the carriage, so that the under side of the carriage may be flat, and thus adapted to hold a piece of paper in place if set upon the same. The carriage and type mechanism are detached from the stand containing the paper-feeding rolls and set directly upon a sheet of paper laid upon a flat surface, such surface taking the place of the platen *o* of the stand A A. The carriage may with equal facility be set upon a package, envelope, or any other object having a flat surface upon which a single line of printing is desired, and when the carriage is properly adjusted over such paper or ob-

ject the type mechanism is fed along upon the carriage through the actuation of the feed by each of the finger-keys that is employed in printing. The carriage may obviously be set upon a surface of any size, and the apparatus is thus adapted to print upon sheets of paper, cards, or objects of much greater magnitude than can usually be printed by a type-writing machine.

I am aware that type-writers have been devised to rest directly upon the surface of the paper and provided with line-spacing as well as letter-spacing mechanism, by which they may print a series of lines upon the surface of the paper. I hereby disclaim such a construction, as my device is not intended to serve any such purpose; but my carriage differs from others in being not only combined with a stand having paper-feeding mechanism, but in being removable from such stand, and formed with a flat under side adapted to rest upon a flat surface, or to hold a sheet of paper in place upon such surface. My type mechanism and carriage are thus enabled to perform a double function.

Figs. 10, 11, and 12 show a device for supporting the ribbon detachably upon the hub of the spool *k* and for letting out the end of the ribbon from the spool as close as may be desired to the platen *o* or point where the type-impressions fall. The device consists in a loop of cord *h*¹, attached to the end of the ribbon *h*. The cord is readily secured to the end of the ribbon by folding over the end of the ribbon and stitching the same fast as shown upon the line *h*² in Fig. 10, thus forming a loop or hem through which the cord may be inserted. The loop is made of sufficient length to pass readily over the flanges of the spools *k* when arranged in a slip-knot, as shown in Fig. 12. The slip-knot or noose is so applied to the hub *k*¹ of the spool as to tighten upon the hub when wound in the proper direction. When thus wound, the noose forms a half-hitch, which grips the hub firmly without any fastening when the ribbon is wound upon the spool. The ribbon is quickly detached from the spool by unwinding the cord from the hub and loosening the noose to slip it over the flange of the spool. As the ribbon, with the loop of cord attached, is a new article, I have claimed the same herein independently of the spool.

The platen or type-impression is in my present machine situated at a considerable distance from the spool, so that the end of the ribbon requires to be extended in some manner, which is effectually secured, in addition to the other advantages mentioned above, by the use of the loop of cord *h*¹.

Having thus set forth the nature of the invention, what is claimed herein is—

1. In a type-writer, the combination, with the type mechanism and means for moving the type downward, of a carriage with flat under side fitted movably beneath the type mechanism and a stand fitted detachably to

the carriage and provided with suitable foot-pieces, with the platen *o* and with paper-feeding devices, and the carriage being thereby adapted when removed from the stand to fit upon a flat surface for printing a single line of characters thereon, substantially as herein set forth.

2. The combination, with the carriage *E* and the parallel grooves *E'*, of the plate *D*, carrying type mechanism, guides upon the plate fitted to the grooves, and gibs fitted adjustably to the edge of the carriage, as and for the purpose set forth.

3. The combination, with the carriage *E* and the parallel grooves *E'*, of the plate *D*, carrying type mechanism, guides upon the plate fitted to the grooves, and the adjustable roll-gibs *c*², fitted to the edges of the carriage, as set forth.

4. The combination, with the carriage *E* and the parallel grooves *E'*, of the plate *D*, carrying type mechanism, the rolls *c'* upon the plate fitted to the grooves, and the adjustable roll-gibs *c*², fitted to the edge of the carriage, as and for the purpose set forth.

5. In a type-writer, the combination, with the type mechanism and means for moving the type downward, of a carriage fitted movably to the type mechanism, the strip-platen *o* upon the carriage, the paper-feeding roll *o'*, provided with a gage-wheel *y*, as set forth, the springs *p'*, pressing the rolls *o*² upon the top of the roll *o'*, and the table *o*³ for guiding the paper beneath the springs *p'*, substantially as herein set forth.

6. In a type-writer, the combination, with the type mechanism and means for moving

the type downward, of a carriage fitted movably beneath the type mechanism and the stand fitted detachably to the carriage and provided with the foot-pieces *A*, the platen *o*, and paper-feeding devices, as and for the purpose set forth.

7. In a type-writer, the combination, with the type mechanism and means for moving the type downward, of a carriage with a flat under side fitted movably beneath the type mechanism and a stand fitted detachably to the carriage and provided with suitable foot-pieces with the platen *o*, and with paper-feeding devices and the carriage being provided with a set of detachable feet *f*, as and for the purpose set forth.

8. In a type-writer, the combination, with the spring-drum and a rotary spindle with squared end, of the pivoted arm *n*, pressed normally toward the spindle and provided with the notch having rounded corner *n*; as set forth.

9. As a new article of manufacture, a type-writer ribbon provided upon the ends with a loop of cord, as and for the purpose set forth.

10. In a type-writer, the combination, with the winding-spool, of a ribbon having a loop of cord secured upon the hub by a half-hitch, as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOSEPH M. CRARY.

Witnesses:

THOMAS S. CRANE,
HENRY J. MILLER.