(No Model.) 3 Sheets—Sheet 1.

G. C. BLICKENSDERFER.

TYPE WRITING MACHINE.

No. 491,071. Patented Feb. 7, 1893.

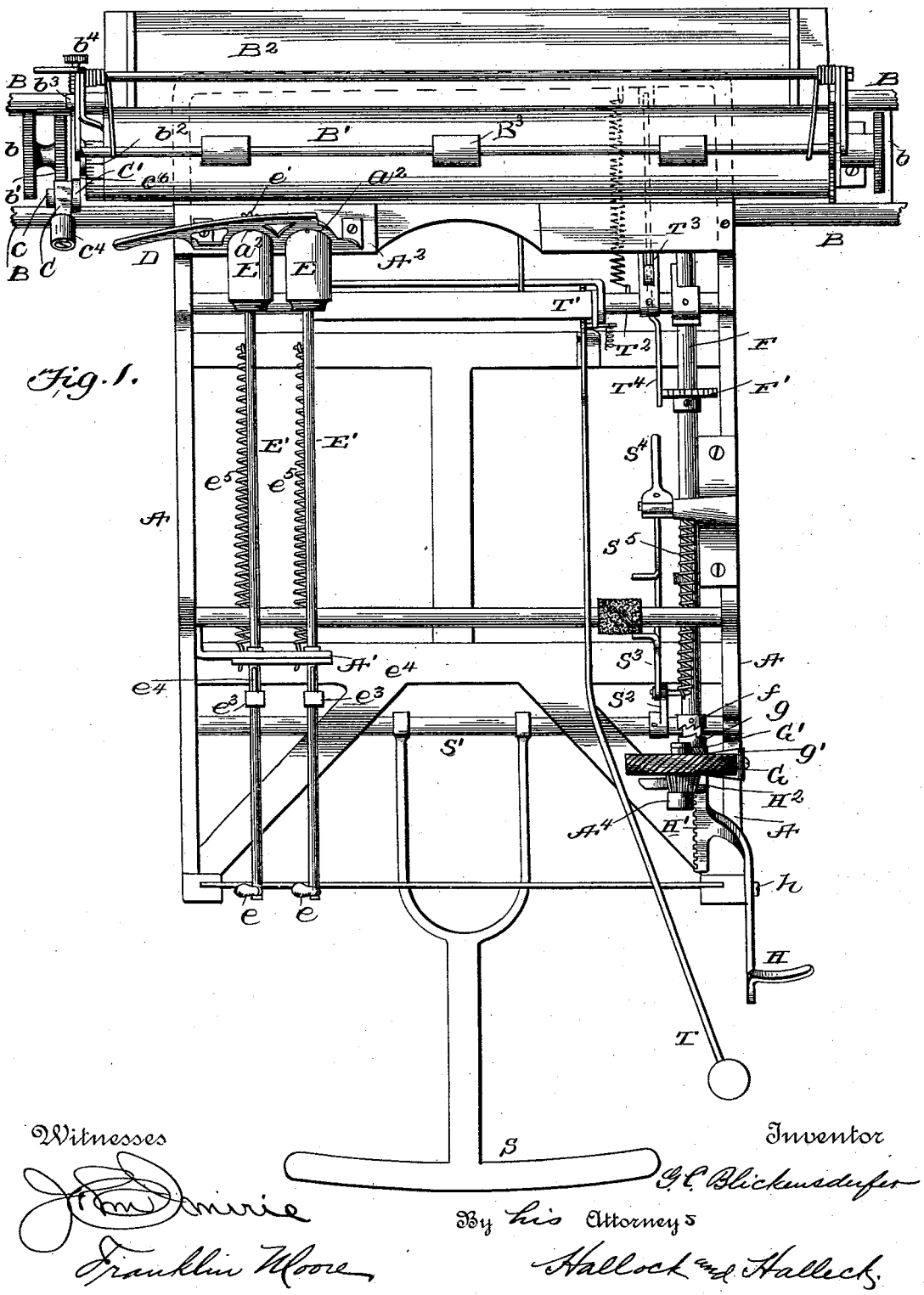

Fig. 1.

Witnesses

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(No Model.) 3 Sheets—Sheet 2.

G. C. BLICKENSDERFER.

TYPE WRITING MACHINE.

No. 491,071. Patented Feb. 7, 1893.

Fig. 2.

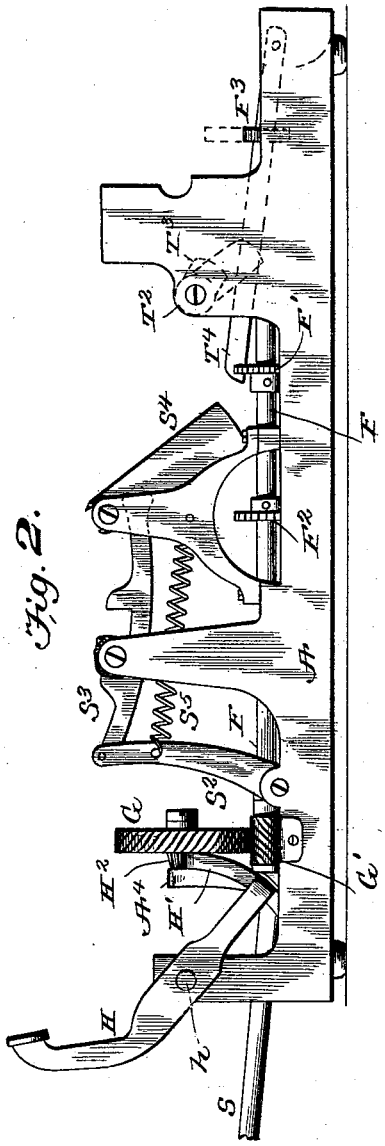
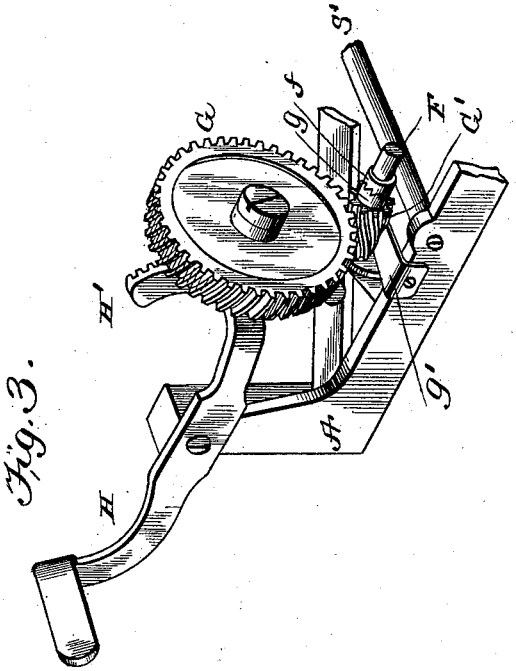


Fig. 3.



Witnesses.

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(No Model.) 3 Sheets—Sheet 3.

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TYPE WRITING MACHINE.

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Fig. 4.

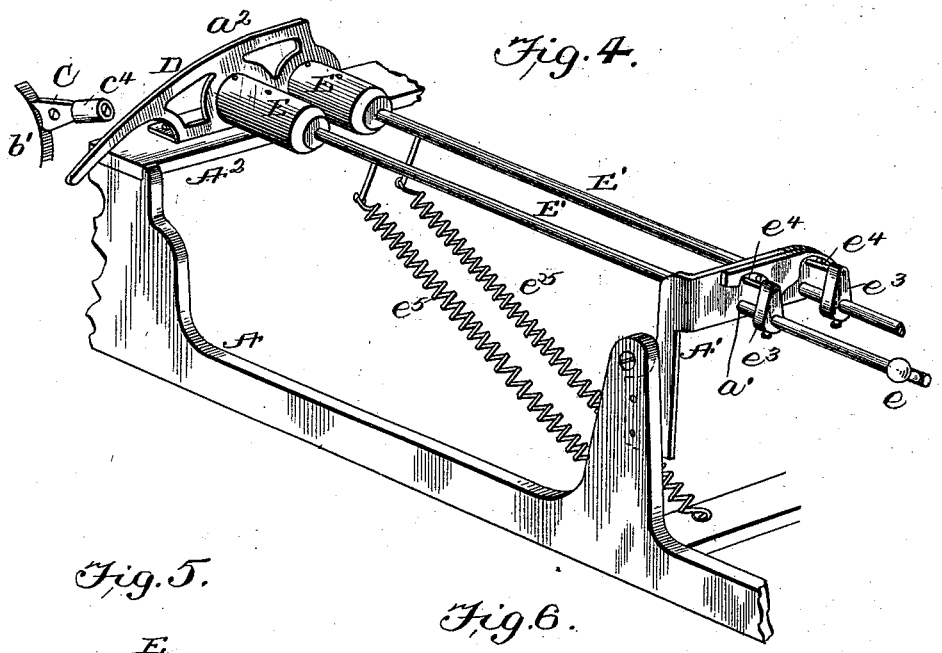


Fig. 5.

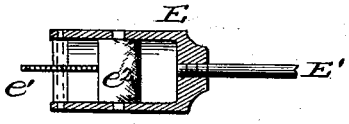


Fig. 6.

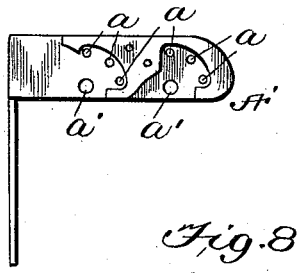


Fig. 7.

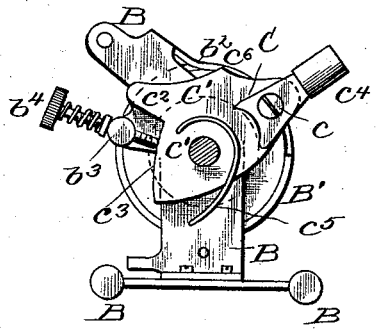
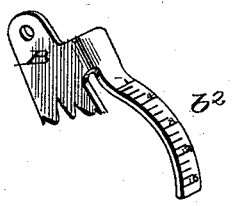


Fig. 8.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE C. BLICKENSDERFER, OF STAMFORD, CONNECTICUT.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 491,071, dated February 7, 1893.

Application filed March 26, 1892. Serial No. 426,505. (No model.)

To all whom it may concern:

Be it known that I, GEORGE C. BLICKENSDERFER, a citizen of the United States, residing at Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Type-Writing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to type-writing machines, and consists in certain improvements in the construction thereof, as will be hereinafter fully set forth and pointed out in the subjoined claims.

The invention is illustrated in the accompanying drawings as follows:

Figure 1, is a top or plan view of a type-writer, such as is shown in Patent No. 459,093, granted to me on the 8th day of September, 1891. In this illustration all of the type keys except one are omitted, and also the type wheel. Fig. 2, is a side elevation of the frame work of the machine shown in Fig. 1, looking at the left hand side of said figure. In this illustration the key-mechanism is omitted and also the paper carriage, type wheel, and so forth, leaving only the carriage, driving shaft and the means for actuating the same. Fig. 3 is a perspective view of the parts shown at the left of Fig. 2, namely the carriage driving shaft, F, the gear for moving said shaft and the lever for moving said gear. Fig. 4 is a perspective view of the ruling devices E, E, and the feed actuating cam D, seen at the left of Fig. 1. Figs. 5 and 6 are detail views, that will be explained in place hereinafter. Fig. 7 is an end elevation of the carriage looking from the left of Fig. 1, with the ratchet wheel b' and the hand wheel b, omitted. Fig. 8 is a detail view that will be referred to in place hereinafter.

The purposes of the invention are, first, to provide improved means for returning the paper carriage to its normal position; second, to provide means for automatically actuating the feed rollers of the carriage as the carriage is returned to its normal position; and, third, to provide improved means for drawing lines upon the paper, such as underscoring, ruling, &c. These several improvements are not limited in their use to machines of the type shown in the drawings, but may be applied to many different types of type-writing machines, and therefore I do not desire to be understood as limiting my invention to any particular type of machine, although it may often be necessary to modify and change the construction here illustrated, in order to adapt the invention to various types of machines. Such modifications, however, will not alter or abridge the essential elementary features of my device, and any person skilled in the art will have no difficulty, after having become familiar with the construction here shown, in adapting my device to most of the various type-writing machines.

The invention as applied to the machine shown in the accompanying drawings, is constructed as follows:

A designates the frame of the machine; B, the frame of the carriage; B′ the large paper roller or platen; B^2 the shield or guide which holds the paper in contact with the platen; B^3 the small feed roller or presser roller.

b b, are the hand wheels at each end of the platen, for manually turning it.

b' is the ratchet wheel upon which the actuating pawl operates, and it is on the shaft of the platen the same as the hand wheels. These just named parts are the same as shown in my former application, Serial No. 410,230, filed the 29th day of October, 1891.

C is the pawl which acts upon the ratchet b', and it is pivoted at c on a plate C′ that is journaled at c' concentric with the ratchet b', on the shaft of the platen, and serves as a pawl carrier. This plate C′ has two limiting faces, c^2 and c^3 which act upon the limiting screw b^4 and the lug b^3 and thus limit the movement of the said plate and its supported pawl. By turning the screw b^4 one way or the other the degree of movement of the pawl carrying plate C′, is regulated. The pawl C′ is weighted by its outwardly extending operating arm so that normally its point is out of engagement with the ratchet wheel and the platen is, therefore, normally free to be rotated in either direction by the hand wheels b b. To operate this pawl mechanism to turn the platen, the outer end of the pawl C is moved upward. This may be done manually or, as will be now de-

scribed, mechanically by the action of the machine. On the outer end of the pawl C there is an antifriction roller c^4 and on the frame piece A^2 of the machine is a cam plate D, in position to contact with the pawl-arm when the carriage is returned to its normal position, that is, into position to commence a new movement to the left. As the carriage is completing its movement to the right, the pawl-arm comes in contact with the lower part of cam D and runs up its inclined face. This lifts the pawl-arm up and moves (by means of the ratchet b') the platen to position the paper for a new line. The cam D is of sufficient length to move the pawl through its farthest limit of action, and it will, of course, move the pawl through any lesser limit of action properly, because such lesser movement will be effected by the upper part of the cam. As the carriage moves to the left in printing a line, the pawl arm leaves the cam, and returns to its normal position by the action of the returning spring c^5 shown in Fig. 7. It will thus be seen that the platen will be turned to position the paper for a new line by simply drawing the carriage back to the position to start a new line, and it may also be turned to feed the paper by manually lifting the pawl arm. Hence when a double space between lines is wanted, the operator will manually lift the pawl-arm and let it react before he returns the carriage to normal; and it will also be seen that the space between the lines is regulated by adjusting the limiting screw b^4. On a quadrant formed arm b^2 extending from the frame work B, as seen in detail in Fig. 8, there is a scale by which the width of line-spaces is indicated to the operator by observing the position of the point c^6 on the pawl carrying plate C', relative to said scale.

In the construction here shown the means for moving the carriage to the left while printing are the same as shown in my aforesaid application serially numbered 410,230, namely a propelling shaft F having thereon, a pinion F^3 shown in Fig. 2 which gears with a rack on the carriage not shown in said figure; a ratchet F' acted upon by a pawl T^4 that receives its action through the type-keys T and the intermediate gearing T', T^2, T^3; and a second ratchet F^2 (Fig. 2) which is acted upon by the pawl S^4 that receives its action from the spacer-key S and intermediate gearing S', S^2, S^3, and S^5; and here, as in the application above referred to, the pawls S^4 and T^4 are normally out of contact with the ratchets upon which they respectively act, and hence the shaft F, is normally free to be revolved by the movement of the carriage manually or by other means than the type-key and spacer-key action; and therefore, the carriage is normally free to be moved manually or by other means than by the action of the keys. In this construction I have provided means for rotating the shaft F by the action of a lever, in a reverse direction from that in which it is moved by the action of the key mechanism, which mechanism is normally free from the shaft and therefore does not interfere with its movement when actuated by the key mechanism. The object of this added mechanism is to enable the operator to return the carriage toward the right for beginning a new line by the manipulation of a special lever or key. The construction of this added mechanism as illustrated is as follows: On the shaft F there is fixed a clutch f, and loosely sleeved on said shaft is a worm-pinion G' having at its end a clutch formation g, to engage the clutch f.

On a part A^4 of the frame work of the machine is journaled a worm-wheel G which meshes with the worm-pinion G'. Attached to this worm-wheel is a beveled spur-gear H^2. On a lever H, which is pivoted to the frame A at h, is a bevel-geared quadrant H', meshing with the gear H^2. Hence by moving the lever H, the worm gearing G, G', will be actuated. The worm-pinion G' is sleeved on the shaft F so as to rotate freely thereon. It is also free to move longitudinally of the shaft to a limited extent. The action of the two parts G and G' upon each other causes the part G' to move back and forth longitudinally on said shaft at the same time that it is oscillated or rotated back and forth on said shaft. The longitudinal movements throw the clutch-formations g and f into and out of action upon each other according to the direction of motion of the parts G, G'. Therefore, when the worm-wheel G is rotated so as to turn the worm gear toward the right hand side of the machine, the clutches g and f will engage and the shaft F will be rotated toward the right. This will draw the carriage back toward the right, and when the action of the wheel G is reversed, the clutches will not engage but will separate and the shaft F will not be moved. When the shaft F is turned toward the left by the action of the type keys or the spacer key, the clutches g and f will quickly become disengaged because when the worm-gear G' is turned toward the left it is moved, by the action of its teeth upon the teeth of the wheel G, out of contact with the clutch-part f. On the frame A, under the worm gear G', I attach a spring g' which presses against the worm-gear and acts as a break to steady its action and prevent it slipping out of engagement with the clutch f too easily. It will therefore be observed that, when the carriage has reached its limit of movement toward the left, and is ready to be returned to the position to commence a new line, the operator by moving the lever H, draws the carriage back to normal and at the same time moves the pawl C up the inclined face of the cam D and thus not only is the carriage returned to normal but the platen is turned so as to move the paper into position to receive a new line of printing.

The means for automatically turning the paper roller and the means for returning the carriage to normal need not necessarily be

used in conjunction, for each may be used separately, but when used in conjunction their conjoined action produces a new and useful result, to wit; the adjustment of all the parts into position to begin a new line by operating a single lever or key.

The means here shown for drawing lines upon the paper are shown in Figs. 1, 4, 5 and 6, and consist of a cylindrical head E, on a rod or shaft E′ journaled on the frame pieces A′, A², at a' and a^2, and having a handle e at the end of the shaft E′ nearest the operator. In Fig. 5, the head E is shown in longitudinal section and the ruling wheel e' and ink roller e^2 are displayed in elevation. At a convenient point on the rod E′ there is an arm e^3 carrying a pin e^4 and on the adjoining frame piece A′, there are three holes a into which said pin can enter, and when entered the shaft or rod can not turn. These holes a are so placed that if the pin e^4 is in the upper one the wheel e' will be in position to draw a horizontal line on the paper, and if in the lower one the wheel will be in position to draw a vertical line on the paper, and if in the middle hole the wheel will be in position to draw a diagonal line on the paper. A spring e^5 is provided for holding the shaft E′ in such a position that the pin e^4 will enter the upper hole a when the shaft and head are moved longitudinally. I adopt this as a normal position because horizontal lines are more often drawn than any others. I provide two ruling devices so that lines in two colors can be drawn.

The operation of ruling is as follows: The operator, to draw a horizontal line will push the rod E′ longitudinally and this will press the wheel e' against the paper and it will enter the pin e^4 in the upper hole a and so lock the rod against turning. He will then draw the carriage one way or the other, as he pleases, and this will effect a horizontal ruling on the paper. If he wants to draw a vertical line he will turn the rod so the pin e^4 will enter the lower hole a and then push it in so as to press the wheel e' against the platen, and then, while holding the ruling device with one hand he will roll the platen with the other hand acting upon one of the hand wheels b. If he desires to draw a diagonal line he will proceed as before only entering the pin e^4 into the middle hole and he will draw the carriage longitudinally while revolving the platen.

In Letters Patent No. 457,333, issued to me August 4, 1891, and in Nos. 459,093 and 459,094, issued to me September 8, 1891, I have shown, described and claimed means for drawing lines upon the paper, and I do not intend to here claim the invention there shown and claimed.

The advantages of my present construction are that the ruling devices can be turned so that the same ruling wheel can be used to draw horizontal, vertical and diagonal lines, whereas in my former constructions a different ruling wheel was used for drawing differently directed lines.

A further advantage exists in the provision of means for operating the ruling devices without reaching over the machine. The first of these advantages is attained by journaling the head carrying the ruling wheel on an axis that is at right angles to the axis of the platen, whereby the said wheel may be presented to the platen with its axis at right angles to the axis of the platen or parallel with the same or at an angle intermediate thereof.

What I claim as new is:

1. In a type-writing machine, the combination of a paper carriage, a driving shaft for moving said carriage on its ways, means for rotating said shaft to move said carriage toward the left as the type-keys and spacer-key is operated, and a reversing lever and proper gearing actuated thereby for rotating said shaft reversely and thereby moving said carriage backwardly or to the right.

2. In a type-writing machine, the combination of a paper carriage, a driving shaft for moving said carriage on its ways, means for rotating said shaft for moving the carriage toward the left as the type-keys and spacer key are actuated, said means being normally out of engagement with said shaft, and a reversing lever and proper gearing actuated thereby which is normally out of engagement with said shaft, for rotating said shaft reversely and thereby moving said carriage backwardly or to the right.

3. In a type-writing machine, the combination of a paper carriage that is normally free to be moved in either direction, paper moving mechanism on said carriage that is normally free to be moved in either direction, a lever on said carriage for actuating said paper-moving mechanism, type-key-levers and a spacer-lever on the frame of the machine by the action of which the carriage will be moved to the left, a reversing lever on the frame of the machine by the action of which the carriage will be moved to the right, and means on the frame of the machine for contacting with and actuating the lever for moving the paper-moving mechanism on the paper carriage when said carriage is being moved by the said reversing lever.

4. In a type-writing machine, the combination of a paper carriage that is normally out of engagement with its actuating means and, hence, free to be moved manually in either direction, mechanism for moving said carriage to the left through the action of the type-keys and the spacer-key, gearing for reversing the action of the said carriage and bringing it back to normal and a lever on the frame of the machine in proximity to the keyboard for operating said carriage reversing gearing.

5. In a type-writing machine, the combination of a paper carriage having a reciprocating movement, means on said carriage for

moving the paper at right angles to the line of the reciprocating motion of the carriage, a ruling device on the frame of the machine, means for bringing said ruling device into action against the paper, and means for turning said ruling device so as to properly act upon the paper when being moved by either the reciprocating movement of the carriage or at right angles thereto or when being simultaneously moved in both said directions.

6. In a type-writing machine, the combination of a paper carriage that is normally free to be moved manually on its ways, means on said carriage for moving the paper at right angles to the reciprocating movement of the carriage, which paper moving means are free to be moved manually in either direction, a ruling device on the frame of the machine, means for bringing said ruling device into action against the paper, and means for turning said ruling device so as to properly act upon the paper when being moved by either the reciprocating movement of the carriage or at right angles thereto or when being simultaneously moved in both said directions.

7. In a type-writing machine, the combination of a reciprocating carriage, means on said carriage for moving the paper at right angles to the reciprocating movement of said carriage and means on the frame of the machine for drawing lines upon the paper when being moved either by the reciprocating action of the carriage or by the paper moving means on the carriage or simultaneously by both.

8. In a type-writing machine, the combination with the carriage moving shaft F of the lever H, having thereon the segment gear H′, the pinion H^2 meshing with said segment, a driving gear moved by said pinion H^2, and a driven pinion on the shaft F and meshing with the driving gear whereby said shaft is rotated by the action of said lever H, substantially as and for the purposes set forth.

9. In a type-writing machine, the combination of the carriage moving shaft F, a clutch *f*, on said shaft, a loose sliding worm pinion G′ on said shaft and having a clutch *g* for engaging said clutch *f*, a worm-wheel G, for rotating and sliding said pinion G′, into engagement with said clutch *f*, a mitered pinion H^2 for rotating said worm wheel and a lever H, with segment H′ for acting upon said mitered pinion H^2.

10. In a type-writing machine the combination with the carriage and the platen thereof, a ruling device consisting of the head E, and rod E′, the inking pad e^2 and wheel *e′* in said head, said ruling device being journaled on the frame of the machine and provided with means for turning the same and for holding the same in position and being also longitudinally movable in its bearings.

11. In a type-writing machine, the combination of a carriage, a platen on said carriage, a ruling device journaled on the frame of the machine, that consists of the head E, the rod E′, the wheel *e′*, the inking pad e^2, the crank handle *e*, the arm e^3 with holding pin e^4, adapted to engage the holes *a* in the frame piece A′, and the reacting springs e^5.

12. In a type-writing machine, the combination of the roller-platen B′, the ratchet *b′* on the shaft of said platen, the pawl C, the pawl-carrying plate C′, having limiting faces c^2 and c^3 and the pointer c^6, and the limiting stop b^3, the limiting screw b^4 and the gage-plate b^2 on the frame B of the carriage in which said platen is journaled.

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

GEORGE C. BLICKENSDERFER.

Witnesses:
JNO. K. HALLOCK,
WILLIAM V. A. POE.