(No Model.) 2 Sheets—Sheet 1.

C. SPIRO.

TYPE WRITING MACHINE.

No. 339,078. Patented Mar. 30, 1886.

Fig. 1.

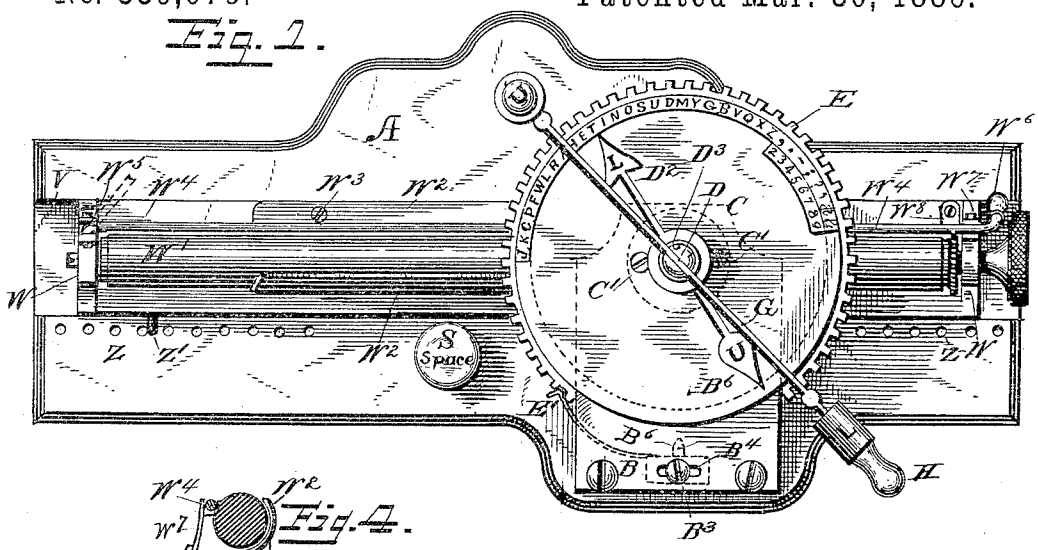


Fig. 4.

Fig. 5.

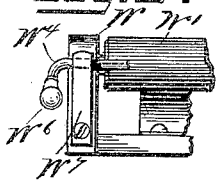


Fig. 6.

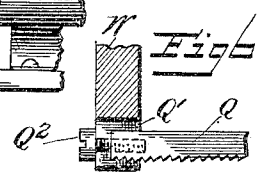
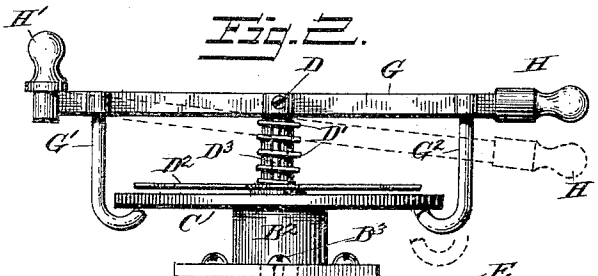


Fig. 2.



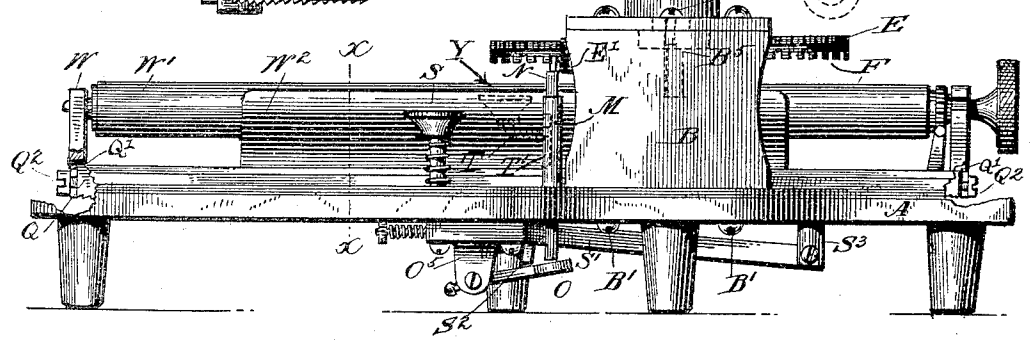
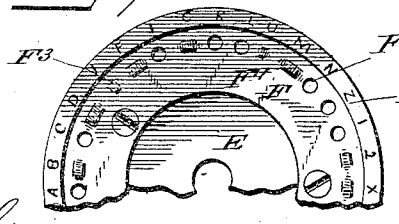


Fig. 7.



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(No Model.) 2 Sheets—Sheet 2.

C. SPIRO.

TYPE WRITING MACHINE.

No. 339,078. Patented Mar. 30, 1886.

Fig. 3.

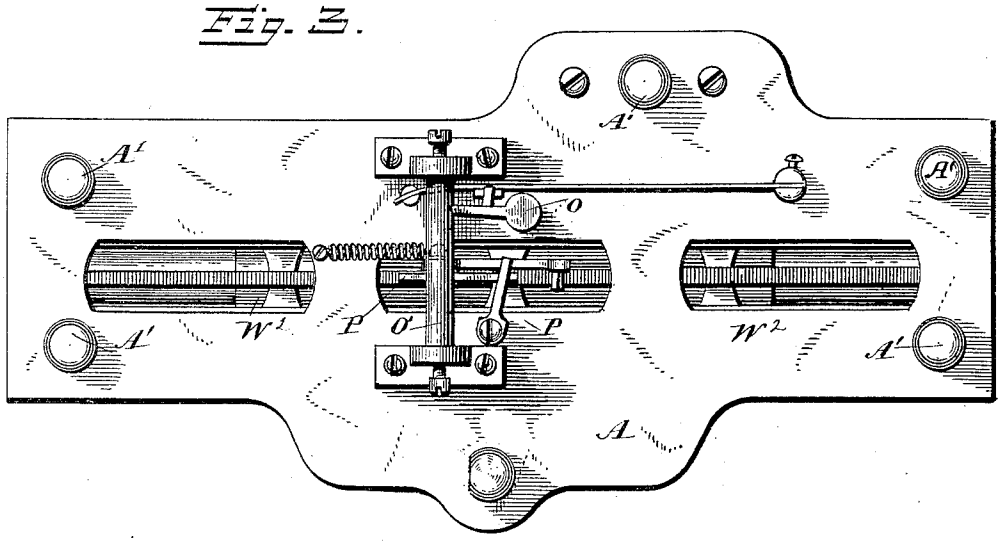


Fig. 8.

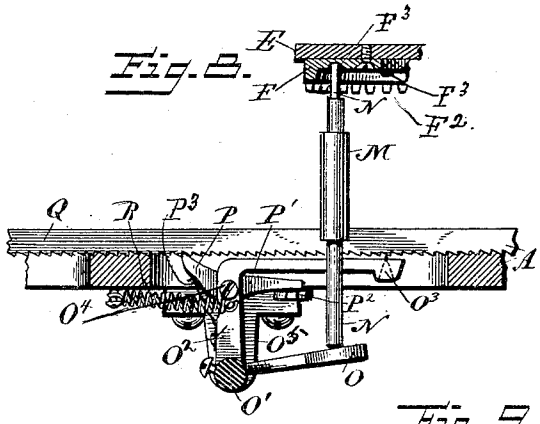


Fig. 9.

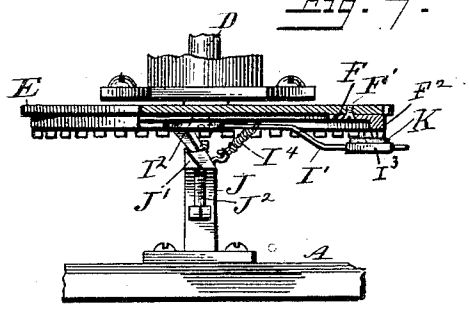
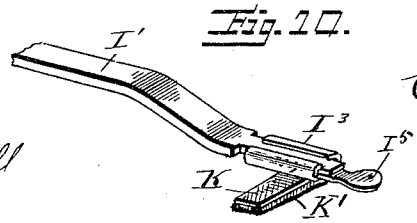


Fig. 10.



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UNITED STATES PATENT OFFICE.

CHARLES SPIRO, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 339,078, dated March 30, 1886.

Application filed August 19, 1885. Serial No. 174,818. (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 and State of New York, have invented certain new and useful Improvements in Type-Writers, of which the following is a specification, reference being had to the accompanying drawings.

This invention has relation to that class of type-writers in which are employed a type wheel or disk and devices for rotating the same to bring a desired printing-character to the printing-point.

Among the objects of the invention are to simplify the construction, reduce the number of parts, provide upper and lower case characters, enlarge the dial, whereby the indicating-characters may be larger and more readily selected, facilitate rapid change from upper to lower case type, arrange the entire feeding mechanism below the table and centrally beneath the platen, arrange the impression and feeding devices so as to receive force in substantially a direct line, and to secure other advantages in construction and operation hereinafter more fully described.

The novel features of the invention will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a plan, Fig. 2 is a front elevation, and Fig. 3 a bottom plan, of a type-writing machine constructed in accordance with my invention. Fig. 4 is a section of the carriage and platen on the line X of Fig. 2. Fig. 5 is a side elevation of the carriage, bracket, and guide-rod. Fig. 6 is a sectional detail illustrating the manner of attaching the rack-bar to the carriage. Fig. 7 is a partial bottom plan of the printing plate, wheel, or disk. Fig. 8 is a side elevation, with parts in section, of the feeding devices. Fig. 9 is a side elevation, with adjacent parts in section, of the inking devices. Fig. 10 is a detail of the free end of the inker-arm.

Like letters indicate like parts in all the figures of the drawings.

A represents the base of the machine, which in this instance is formed of a single piece, and is provided with feet A′, which support the base above a desk or table, and provide a space between the desk and the base for the feeding devices hereinafter described, all of which are located beneath the base.

B represents a bracket, which may be formed as a part of the base, but in this instance is secured thereto by screws B′. This bracket serves the purpose of supporting the printing-disk, the dial, and the impression-lever, for which purpose it projects over the base, as shown by dotted lines, Fig. 1. The bracket is provided with a central boss or hub, B^2, to which is secured the dial C, the screws C′, Fig. 1, passing through the dial and into the end of the boss. The dial and boss are perforated for the reception of the spindle D, at the lower end of which is secured the locking-wheel E and the printing wheel or disk F, which is mounted upon the spindle D so that it is inclined in order to present but a single printing-character upon the printing-field, which is substantially at the point indicated by the arrow Y. It is readily seen that without this inclined arrangement of the printing-disk more than one character would be impressed at the printing-field, as it is located upon the platen or roller, which is disposed horizontally upon the carriage. The locking-wheel may or may not be also inclined as shown.

At the upper end of the spindle D is pivotally secured the impression-lever G, which extends completely across the dial C, and is provided near each end with hooks G′ G^2, which extend inwardly beneath the dial, and come in contact with its under surface.

Below the lever G, and encircling the spindle, is a coiled spring, D′, which bears against the under surface of the impression-lever, and upon a double-pointed indicator, D^2, which is perforated to embrace the spindle, and is provided with a lug (not shown) to project into a longitudinal slot, D^3, formed in the spindle, whereby the spindle may be vertically reciprocated, and yet serve to horizontally rotate the indicator. One of the points L of the indicator is employed to indicate characters of the lower-case, while the opposite point, U, of said indicator is employed to indicate characters of the upper-case, the latter indicating-characters being shown in Fig. 1, while the

former are intended to be represented in the unoccupied portion of the dial, as represented by dotted circle in said figure. An additional circle of characters—as those indicating numerals—may be arranged within the outer circle, as shown in Fig. 1, so that with one or the other points of said indicator pointing thereto said character shall be brought to the printing-point, the usual relation between the indicating-dial and the printing wheel or disk being observed by properly locating the printing-characters upon the printing wheel or disk.

As thus far described, it will be seen that by turning the impression-lever horizontally around the spindle as a center the indicator D^2, the spindle, the locking-wheel, and the type-disk will all be simultaneously rotated, and by depressing one or the other ends of the lever the locking-wheel and the type wheel or disk with the spindle will be depressed and the character indicated will be printed.

When it is desired to operate the lower-case, the handle H of the impression-lever is brought into use, so that that end of the indicator which selects the lower-case type will be brought under observation in selecting the character to be printed. After the character is selected the handle H is depressed, as shown by dotted lines, Fig. 2, when the hook G′ at the opposite end of the lever acts as a fulcrum, and the hook G^2 is depressed with the lever, as shown by dotted lines.

I here emphasize the fact that I secure motion of the spindle in a direct line at the expenditure of a minimum force, because of the pivotal connection of the impression-lever centrally with the spindle, while the necessary lateral movement is provided for at the end of the hook G′, which is rounded to reduce friction, while it moves outwardly from the center, and upon the under surface of the dial. In this construction the friction occurs at one point only—namely, the extreme end of the hook, which is rigidly connected with the lever instead of being pivotally connected therewith and pivotally embracing a ring arranged concentric with and below the lever, as heretofore.

By employing the opposite handle, H′, of the impression-lever the opposite end of the indicator is brought into use, whereby characters of the upper-case are selected, so that all that is necessary to change from upper to lower case is to change the handle employed.

In making the impression the different outlines of the ends of the indicator, the different positions of the handles, or the letters "L" and "U" upon these parts are adapted to show at a glance which class of characters is being employed. Furthermore, the particular arrangement of the parts of the machine is such that the work is directly in sight of the operator at and immediately after the impression of each character. This advantage is as full and complete as in the use of an ordinary pen or pencil, in that the last character printed is instantly brought to sight, and the work can readily be returned for correction, so that another character can be imprinted directly upon a preceding one, the entire operation being governed by the sight of the operator and without any calculation as to the mechanical spacing required to reach the exact printing-point.

Upon the top of the bracket B is a screw, B^3, passing through a slot, B^4, and into a locking-bracket, B^5, (see dotted lines, Fig. 2,) which projects downwardly, and is provided at its lower end with a V-shaped flange, B^6, Fig. 1, which is adapted to mesh with the teeth on the periphery of the locking-wheel E. A detent-spring, E′, is also secured to the inner face of the bracket B, and its free end rides in the teeth of the locking-wheel. The point of the spring which meshes with the teeth is at such a distance from the flange B^6 of the bracket B^5 that the said flange will also mesh with the teeth of the locking-wheel when it is depressed for the purpose of making an impression, thus securing a proper alignment of the work. When said wheel is elevated for the purpose of rotation to select characters, the flange B^6 is below and out of mesh therewith. The detent E′ is always in mesh with the wheel. The object of the flange B^6 is to preserve the alignment of the printed characters when once the locking-bracket B^5 has been adjusted by means of the screw B^3 in the slot B^4.

The next portion of the machine which will be described is the inker and devices for operating the same. At the lower end of the spindle D is pivotally secured in any suitable manner the inker-arm I′, which at its pivoted end is provided with a downwardly-inclined lug, I^2, and at its free end is provided with a removable inking-pad carrier, I^3. Between the free and pivoted ends of the inker-arm I′ is attached thereto a coiled spring, I^4, the opposite end of which is secured to a standard, J, mounted on the base A and located in rear of the bracket B and beneath the type-wheel or printing-disk. This standard has an inclined lug, J′, which operates in connection with the inclined lug I^2 of the inker-arm when the spindle is depressed to produce a partial rotation of the free end of the inker-arm in one direction, and when the said parts are elevated by the action of the spring D′ on the spindle the spring I^4 retracts the inker-arm to its normal position, which is or may be below and in contact with the printing-characters and above the printing-field of the machine.

The inking-pad K consists of any absorbent material charged or impregnated with an ink, and this pad is secured to an arm, K′, projecting from the body of the ink-pad-carrying device I^3, which body is formed as a sleeve, which, by means of a handle, I^5, may be slid upon or removed from the free end of the inker-arm I′, the latter being reduced to enter the sleeve, as clearly shown in Fig. 10.

The printing disk or wheel is formed separately from the locking-wheel, and secured thereto by screws F'.

The printing-characters are formed on a depending flange, F^2, at the periphery of the disk, and inside of said flange is formed a series of space-varying elevations and depressions, F^3, each in height or depth being exactly proportioned to the printing-character immediately adjacent thereto.

The whole printing-disk is preferably formed as a stereotype or electrotype—that is, the characters and the variable spacing projections and depressions F^3 are formed in one piece, so that by simply removing the screws F' the printing-disk may be removed and another substituted therefor having a different style of type with their proper spacing devices.

With the printing-disk of the character just described secured to the locking-wheel, the construction and operation of the feeding devices may be readily understood. In rear of the bracket, and beneath the type-disk, there is mounted upon the base a tubular standard or bracket, M, through which and the base a rod, N, passes downwardly into contact with and resting upon a rock-arm, O. Said rock-arm projects from a rock-shaft, O', which extends beneath the carriage and across its path, being supported in brackets O^5.

By referring to Fig. 8 it will be seen that the rock-shaft O' is provided with another rock-arm, O^2, which extends vertically from the shaft, is projected laterally, and is provided at its end with a check-pawl, O^3. Near the upper end of the vertical portion of the arm O^2, as at O^4, is pivoted an operating-pawl, P, which is projected beyond its pivot in an irregular or cam shape, as at P', which rides upon a projection, P^2, of the base A. A spring, P^3, serves to throw the pawl P upwardly into contact with the rack when not otherwise affected.

Q represents the rack-bar, secured to, or it may be formed as a part of, the carriage. Having these elements in mind, it will be seen that when the rock-arm O is depressed the check-pawl O^3 is removed from contact with the rack-bar by reason of the oscillation of the rock-shaft O', and that for the same reason the pawl P is caused to move to the right and mesh with one or several teeth in the rack-bar, in accordance with the extent of the depression of the rock-arm O. In this instance the parts are so proportioned that the greatest depression of the rock-arm O causes the pawl P to pass over six teeth of the rack-bar, and by regulating the depression of said arm O said pawl may be made to take either one, two, three, four, five, or six teeth. After being so depressed the coiled spring R, connected with the bed A and arm O^2, serves to move the carriage and the feed devices and to elevate the rock-arm A' for another depression. Now, it will be seen that by depressing the impression-lever H the space-varying devices of the type-disk are brought into immediate direct contact with the upper end of the rod N. If such space-varying device be an elevation, (as with a letter requiring a comparatively broad printing-field,) the rod N will be depressed to a greater extent than in case of a depressional spacing device, (which would be deepest when the letter "i," for example, is to be printed,) when said rod is depressed to a less extent, so that the number of teeth taken by the pawl P is directly controlled and the feed of the entire carriage is completely regulated by the space-varying devices themselves, and the entire operation is accomplished by force traveling in substantially a straight line from the impression-lever downward.

In Fig. 2 I have indicated a spacing-key, S, which is connected with a lever, S', having a a projection, S^2, adapted to be brought into contact with the rock-arm O, said lever being fulcrumed in a lug, S^3, depending from the base A.

To avoid the provision of the several parts just mentioned, I may mount upon the rod N a bracket, T, as shown by dotted lines in Fig. 2, which bracket may pass through a slot, T', formed in the tubular standard or bracket M. Said bracket would be provided with a button or key, to facilitate its operation. By this means a depression of the bracket T would cause a movement or feeding of the carriage without the impression of a type upon the paper.

The carriage is adapted to ride in ways V, formed in the base, said carriage comprising a base and end brackets, W, in which is mounted the platen or roll W', onto which the paper is guided by a plate, W^2, secured to the rear edge of the carriage by screws W^3, or otherwise. A guide-rod, W^4, is pivotally mounted in one of the brackets W by being bent at a right angle to its length and entered into an aperture formed in the bracket, a spring, W^5, retaining the rod in the aperture, and yet permitting the free end of the rod, which is provided with a handle, W^6, to be raised vertically and to be moved within certain limits horizontally away from the roll W', as indicated by dotted lines at the left of Fig. 1. The free end of the rod is maintained in a recess in the bracket W at the right end of the carriage by means of a spring, W^7, so secured as to bear against the side of the rod.

The usual pawl and ratchet, W^8, are employed to determine the line-spacing of the work.

The paper is introduced at the rear of the machine by passing it between the roller and the plate W^2, and by also passing its front end under the rod W^4, which serves to keep the paper in contact with the upper surface of the roll.

To regulate the length of line printed, holes Z are formed in the base, and a peg or pegs are inserted in said holes, so that as the carriage advances projections Z' thereon will come in contact with said peg or pegs. The rack-bar Q extends from end to end of the carriage and enters slots Q', formed in the

brackets W of the carriage and at the lower edge thereof. A screw, Q^2, the head of which is wider than the slot Q′, is seated in the end of the rack-bar Q. Now, it will be seen that each of the ends of the rack-bar being thus connected with the carriage, all that is necessary in order to remove the rack-bar is to loosen one of the screws Q^2, (see Fig. 2,) or, if it be desirable to adjust the rack-bar longitudinally upon the carriage, one of the screws may be loosened and the other tightened. Furthermore, it will be noticed that the teeth of the rack-bar are above the plane of the feet of the brackets, so that when the carriage is removed from the machine and placed upon a desk or table the teeth of the rack-bar are preserved from injury, as the carriage rests upon its feet, while the rack-bar is elevated above said feet.

By reference to Fig. 9 it will be seen that the standard or stud J is provided with an impression-adjusting screw, J^2. This screw projects upwardly above the stud, and serves as an abutment against which the printing-disk strikes at the time the impression is made. By a proper adjustment of the screw vertically the pressure of the printing-disk upon the paper may be regulated so that no more than sufficient force or impact of the type against the paper will take place than is required to give a clear impression.

Having thus fully described my invention and its operation, what I claim is—

1. The combination of a base, feeding-pawls arranged beneath the same, a vertically-reciprocating printing-disk arranged above the feeding-pawls, and a single rigid intermediate vertically-movable rod having direct contact with the printing-disk and with the feed-pawl arm, substantially as specified.

2. The combination, with a base, of a paper-carriage mounted to move longitudinally thereon, and provided with a central longitudinal rack-bar, a feeding-pawl arranged to mesh with said rack-bar and mounted upon a rock-shaft crossing the path of the carriage, and provided with a rock-arm projecting to a point beneath the printing-disk, and a single rigid vertical rod resting upon said rock-arm and arranged to receive movement from the printing-disk, substantially as specified.

3. The combination of a base and bracket, a vertical spindle mounted in the bracket and carrying a printing-disk, a dial mounted on the bracket, and an impression-lever pivotally mounted in the spindle and having a rigid depending hook projecting beneath the dial and having contact therewith, substantially as specified.

4. The combination of a base, a bracket supporting a dial, a printing-disk, and a locking-wheel mounted on a vertical spindle passing through said bracket and dial, and an impression-rod pivotally mounted in the spindle, extending completely across said bracket, and provided near each of its ends with a depending hook which projects beneath the dial, and a spring arranged between the lever and the dial, substantially as specified.

5. The combination, with a base and bracket, of a printing-disk, a locking-wheel, a longitudinally-grooved spindle, and a dial supported by the bracket, an indicator embracing the spindle and entering the groove thereof, a lifting-spring mounted on the spindle, and an impression-lever extending across the dial, pivotally secured to the spindle, and provided with hooks taking under the dial, substantially as specified.

6. The combination of an upper and lower case printing disk and upper and lower case indicating dial, a spindle secured to the disk and passing through the dial, a double-pointed indicator, and an impression-lever pivotally mounted in the spindle and provided with a hook and a handle at each end taking under the dial, the impression-lever and indicator being so relatively arranged that one end of said double indicator operates in connection with one handle of the impression-lever and the other end of said indicator operates in connection with the other handle of the same to indicate upper and lower case characters, substantially as specified.

7. The combination, with the type-disk, of a bracket, a locking-wheel, a detent-spring supported upon the bracket, and an adjustably-supported flanged locking-bracket adapted to mesh with the locking-wheel, substantially as specified.

8. The combination of a vertically-reciprocating printing-disk provided with an oscillating inker-arm having a depending inclined lug, and a fixed stud mounted upon the base of the machine and adapted to operate the inclined lug of the inker-arm, substantially as specified.

9. The combination of a vertically-reciprocating printing-disk provided with an oscillating inker-arm having an inclined lug, and a removable ink-pad carrier mounted at the free end of said arm, a fixed stud adapted to impart oscillatory motion in one direction of said arm, and a spring secured to said arm and to said stud for giving motion to said arm in the opposite direction, substantially as specified.

10. The removable ink-pad carrier, consisting of a sleeve adapted to embrace the end of the inker-arm, formed as a handle and having a plate for supporting the pad, substantially as specified.

11. The combination, with the brackets of a paper-carriage, slotted as described, of the rack-bar entering said slots and the binding-screws bridging said slots, substantially as specified.

12. The combination, with the paper-carriage and its roller, of a guide-rod pivoted at one end thereon and a spring arranged to bear upon the pivoted portion of the rod, whereby the free end of said rod may be swung upwardly and away from the carriage, substantially as specified.

13. The combination, with a carriage and its roller, of a guide-rod pivoted at one end of the carriage, held in its pivotal bearing by a spring, and retained in connection with its bearing at its free end by means of a spring, substantially as specified.

14. In a carriage, the combination of the roll or platen, a guide-plate passing from the rear beneath and upwardly in front of the roll, and a guide-rod removably arranged opposite the guide-plate, substantially as specified.

15. The combination of the base A, bracket B, dial C, rigidly mounted on the bracket, and the printing-disk F and locking-wheel E, mounted on the spindle D in an inclined position, the spring D′, and the impression-rod G, having the hooks G′ G² and handles H H′, substantially as shown and described.

16. The combination, with the printing-disk, of the spindle D′, having the groove D³, the dial C, the indicator D², having a lug entering the groove D³, the spring D′, and the lever G, having the hooks G², substantially as shown and described.

17. The combination of the impression-rod G, having the hooks G′ G², the spindle D, the spring D′, the dial C, the bracket B, the rod N, the feed devices, and the rock-arm O, connected with the feed devices, substantially as shown and described.

18. The combination of the base A, provided with the standard M, the rod N, the bracket T, the feed-rack and pawl, and the rock-arm O, connected therewith, substantially as shown and described.

19. The combination, with the base A, provided with the standard M and projection P², of the rod N, the rock-shaft O′, supported in depending brackets O⁵, and provided with the rock-arms O O², the latter having the check-pawl O³, and pivotally-supported pawl P, having the cam-extension P′, substantially as shown and described.

20. The combination, with the base A, provided with the stud J, having the inclined lug J′, of the vertically-reciprocating spindle D, locking-wheel E, and printing-disk F, the oscillating inker-arm I′, the pivot I² thereof, and the removable sleeve I³, carrying the ink-pad K, substantially as shown and described.

21. The combination, with the inker-arm I, of the sleeve I³, provided with the pad-supporting plate K′ and the handle I⁴, substantially as shown and described.

22. The combination of the brackets W, the pivoted rod W⁴, and the spring W⁵ W⁷ and roller W′, substantially as shown and described.

23. The combination, with the feed-pawl arm and with a single rod for operating the same, of a type-disk having directly-interposed space-varying devices, substantially as specified.

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

CHARLES SPIRO.

Witnesses:
JULIUS E. LEVY,
EDWD. H. WESTERFIELD.