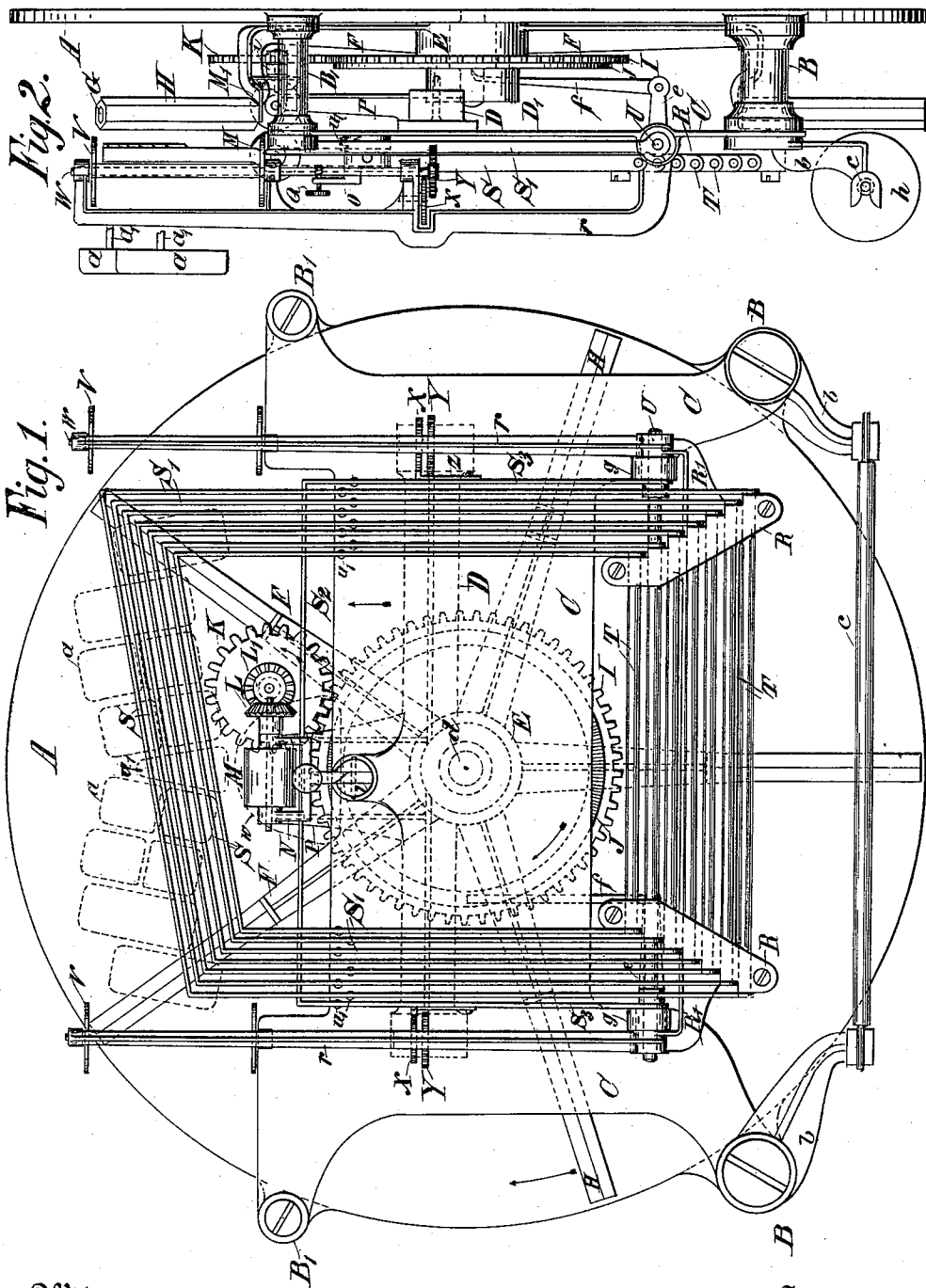


J. F. HARDY.
TYPE WRITING MACHINE.

No. 583,621.

Patented June 1, 1897.



Witnesses:
W. D. Shafer.
John W. Adams.

Inventor:
John F. Hardy.
By his Attorneys.
Dayton, Poole & Brown.

(No Model.)

3 Sheets—Sheet 2.

J. F. HARDY.
TYPE WRITING MACHINE.

No. 583,621.

Patented June 1, 1897.

Fig 3.

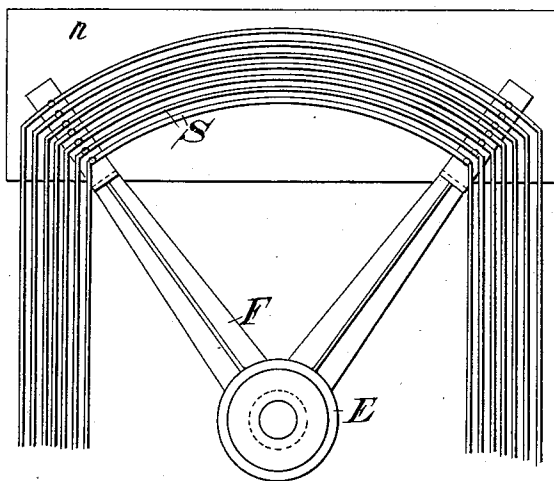


Fig 4.

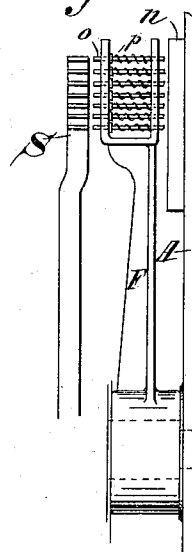


Fig 6.



Fig 7.

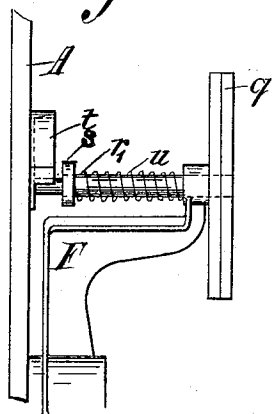
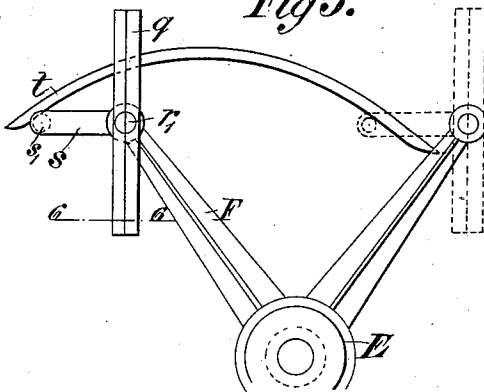


Fig 5.



Witnesses.
W. D. Shafer.
John W. Adams.

Inventor:
John F. Hardy.
By his Attorneys.
Dayton, Poole & Brown

J. F. HARDY.
TYPE WRITING MACHINE.

No. 583,621.

Patented June 1, 1897.

Fig. 8.

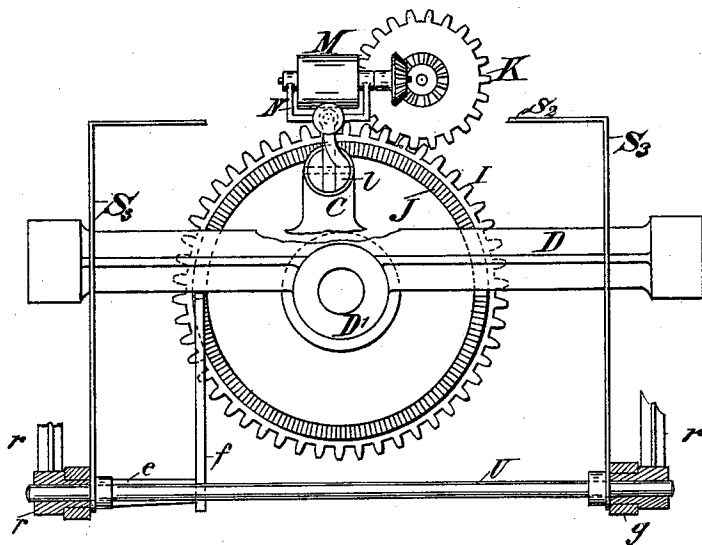


Fig. 9.

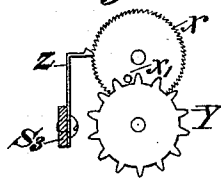


Fig. 10.

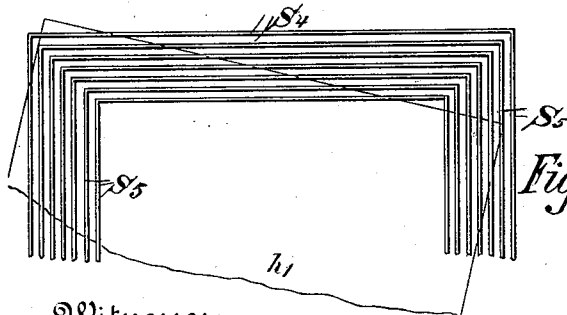
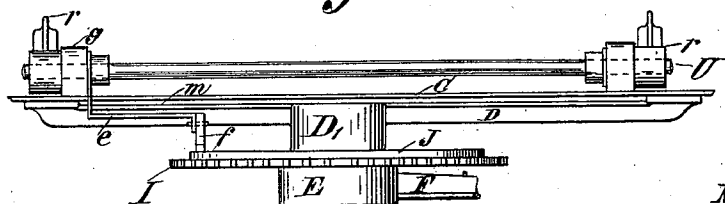
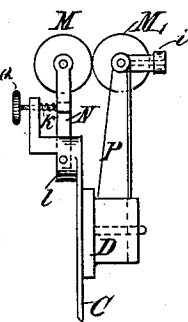


Fig. 11.

Fig. 12.



Witnesses:
W. D. Shafer.
John W. Adams.

Inventor:
John F. Hardy.
By his Attorneys.
Dayton, Poole & Brown.

UNITED STATES PATENT OFFICE.

JOHN F. HARDY, OF CHICAGO, ILLINOIS.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 583,621, dated June 1, 1897.

Application filed July 31, 1895. Renewed September 28, 1896. Serial No. 617,832. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. HARDY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful
5 Improvements in Type-Writing Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference
10 marked thereon, which form a part of this specification.

This invention relates to improvements in hand-operated printing-machines of that class which include type-writing and stenographic
15 machines, &c., and in which a succession of different or differently-located characters or marks may be impressed upon a paper sheet or strip by the depression of different operating-keys; and it relates more particularly to im-
20 provements in that type of machines which print the marks or characters in a succession of separate lines extending transversely across the sheet or strip of paper in distinction from those which print in a continuous line ex-
25 tending longitudinally of an elongated paper strip or roll.

Among other improvements my invention contemplates such an arrangement of mechanisms as will automatically effect the print-
30 ing of the copy in successive transverse lines reading from left to right of the sheet without requiring a paper-carriage or any other part of the machine to be set back or readjusted after each line is completed before the
35 next line can be commenced, or, in other words, an arrangement which will enable the operator to print an indefinite quantity of copy in lines as above stated by a continuous and uninterrupted operation of the keys,
40 while the arrangement of the printed matter in lines is accomplished without his attention or volition by the automatic action of the machine under the impulses afforded by the repeated striking of the keys.

45 A type-writing or similar machine embodying my invention is accordingly provided with a plurality of printing-bars or type-bars extending across the paper and a number of moving members or anvils adapted to pass
50 in succession along the type-bars as the latter are successively actuated. An inking-ribbon is provided along the path of said mov-

ing members adjacent to the paper and is adapted to be forced into contact with the paper when the type-bar is moved by the strik- 55
ing of a key at a point opposite the type-bar and the moving member, so that the actuation of the successive type-bars in connection with the advance movement of the moving members will impress on the paper a series 60
of marks or characters extending transversely across the strip or sheet. Feed devices for the latter are at the same time arranged to advance the sheet in a step-by-step manner as the successive characters are impressed, so 65
that as one moving member passes out of operative relation to the type-bars and the next member enters such relation the dots or characters produced by the coöperation of the latter member will be impressed upon a fresh 70
surface of the sheet and form a distinct reading-line from that previously formed.

My invention consists in the matters herein set forth and particularly pointed out in the appended claims, and will be more fully under- 75
stood from the following description of the devices illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view of a stenographic machine constructed in accordance with my 80
invention. Fig. 2 is an end view thereof, the machine being turned up on its side. Fig. 3 is a fragmentary top plan view of an embodiment of my invention somewhat modified from that previously shown. Fig. 4 is a side 85
elevation thereof. Fig. 5 is a top plan detail of a modified form of platen-actuating mechanism. Fig. 6 is a sectional detail taken on line 6 6 of Fig. 5. Fig. 7 is a side elevation of the construction shown in Fig. 5. Fig. 8 90
is a top plan detail showing more particularly the paper-feed mechanism of the machine. Fig. 9 is a detail of the ribbon-feed. Fig. 10 is a rear view of the device shown in Fig. 8. Fig. 11 is a detail in side elevation of the pa- 95
per-feeding rolls. Fig. 12 is a diagrammatic detail of an arrangement of the type-bars somewhat modified from that previously shown.

In said drawings, A designates the base- 100
plate of the machine, B B and B' B' supporting-standards secured to said base-plate, and C a horizontal paper-supporting plate carried by the standards B and B'.

S S designate a plurality of horizontal printing or type bars arranged parallel to each other and extending transversely across the machine forward of the front edge of the plate C. The ends S' of the bars S are herein shown as bent rearwardly to serve as radial arms, by which the bars are pivotally supported, each pair of said arms being connected by a pivot-bar T. The pivot-bars T are journaled in bearing-blocks R back of the rear edge of the plate C, and the blocks R are carried by a transverse frame R', that is pivotally supported on a transverse shaft U. The latter is mounted in upwardly-projecting lugs g, that are located in rearwardly-projecting lateral extensions c of the plate C, said extensions being extended back to engage the rear supporting-standards B. Each of the type-bars S together with its radial arms S' and pivot-bar T consequently form a rectangular oscillatory frame, and the several frames thus formed are made of proper size to lie one within the other without interference. The several type-bars S are adapted to be separately depressed by means of directly-attached keys a, the depending stems a' of which are soldered or otherwise secured to said bars. In this instance two sets of such keys are shown as arranged symmetrically on opposite sides of the machine, each bar being provided with a key in each set, so that either hand may be used with perfect facility in operating the machine.

H H designate a plurality of radial platen-bars or anvils secured to the outer ends of arms F, that radiate from a central hub E. The latter is pivotally mounted at the center of the base-plate A upon an upwardly-projecting pin or stud d and has a gear-wheel I secured to its upper end. The upper face of said gear-wheel is formed with an annular ratchet-toothed surface J, which is normally engaged by an operating-pawl f. The latter is pivoted at its rear end to a downwardly and inwardly extending rock-arm e, which depends from the inner end of one of the pivoted supporting-arms S³ of the space-bar S². Said arms S³ are pivotally attached to the transverse shaft U, while the space-bar itself extends transversely across the frame beneath the side arms S' of the type-bars and is adapted for oscillation whenever either of the type-bars is depressed. Coiled springs u', applied between the arms S' and S³ and the plate E, (see Figs. 1 and 2,) return the type and space bars to their uppermost position after being depressed and normally maintain them in that position. Obviously, therefore, the actuation of any key will operate through the space-bar and the connected pawl f to give the hub E, and consequently the platen-bars H, a rotary impulse equal to one tooth of the annular ratchet J, and the platen-bars are thus advanced in a step-by-step manner as the characters or marks are impressed upon the sheet. Said space-bars may also be independently operated to advance the platen by

means of a space-key w, which is located centrally behind the two groups of keys a. The platen-bars H are spaced at such distances apart relatively to the length of the type-bars S that as each platen-bar in turn is carried from beneath the type-bars at one end of the same the next succeeding platen-bar is advanced beneath the type-bar at their other ends, so that one platen-bar, and only one, will be always in position to receive the impression of the type-bars. As herein shown, said platen-bars are five in number and are spaced at equal distances apart around the hub E. The latter, together with its radial arms F, is located close to the base-plate A, and the extremities of said arms are bent upwardly to support the platen-bars at the desired height, or just below the plate C. Said platen-bars are furthermore herein shown as made of hexagonal shape and comprise an outer covering, of rubber, which fits over an inner metallic core G, one of the sharp angles of the hexagon being arranged uppermost. Moreover, said cores G are pivotally connected with their supporting-arms, so that the platen-bars may be turned to bring either angle of the hexagon uppermost, the said platen-bars being turned to bring fresh edges into operative position as those used become defective from wear.

The inking-ribbon of the machine is provided on spools V, which are secured upon horizontal shafts W at each end of the type-bars. Said shafts are journaled in bearings which depend from bracket-arms r, that are mounted on the ends of the transverse shaft u and extend upwardly and forwardly therefrom past said type-bars S. Said bracket-arms are in this instance made integral with the transverse frames R', on which the bearings R for the type-bars are mounted, so that by lifting either of said brackets r the whole type-bar and inking mechanism may be swung up about the shaft U, so as to expose the work beneath. The shafts W and spools V are given intermittent rotary movement as the type-bars are depressed by means of spring-pawls z, which are secured to the side arms S² of the space-bar and extend upwardly therefrom to engage ratchet-wheels x. The latter are revolvably mounted adjacent to the shafts W and are each provided with a single laterally-projecting pin x'. Said pins are adapted to engage the teeth of pinions Y, that are fixed to the rear ends of the shafts W and serve to advance the latter through an angular distance equal to that of one tooth of the pinions once in each revolution of the ratchet-wheels x. As the machine is operated, therefore, the inking-ribbon will be gradually wound from one spool upon the other and will thus constantly present a fresh surface for the action of the type-bars.

The paper upon which the machine operates may be as wide as the distance between the innermost radial arms S' and may be provided either in sheets or in a roll. In the

approved construction herein shown provision is made for the support of a roll *h* of paper upon a transverse shaft *c*, which is journaled at the rear of the machine in bracket-arms *b*, that project rearwardly from the standards *B*. From the roll *h* the paper is fed forwardly between the platen and type-bars by means of feed-rollers *M* and *M'*, that are in this instance located centrally of the machine just forward of the plate *C*. As herein shown, the lower roller *M'* is journaled between the arms of a forked bracket *P*, which projects longitudinally forward from a transverse bar *D*. The latter is secured at its extremities to the under side of the plate *C* and is furthermore supported at its center by being provided with a cylindric boss *D'*, which fits over the stud *d* above the toothed wheel *I*. Rotary movement is imparted to the roller *M'* by a bevel-gear *L*, which is fixed to the projecting end of the roller-shaft and intermeshes with a second bevel-gear *L'*. The shaft of the latter is journaled in a projecting arm *i* of the bracket *P* (see Fig. 11) and has fixed to its lower end a spur-pinion *K*, which intermeshes with the central gear-wheel *I*. Consequently as the depression of each type-bar gives a rotary impulse a similar impulse will be transmitted to the feed-roller *M'* and advance the paper correspondingly.

The upper roller *M* is not positively actuated, but is mounted in an oscillatory frame *N* and rests yieldingly on the lower roller *M'*. The frame *N* is herein shown as pivotally mounted in a central slot in an upwardly-projecting lug *l*, located on the plate *C* near the front edge thereof. A bracket *O* of said lug *l* projects upwardly and forwardly over the frame *N* and is provided at its extremity with an adjusting-screw *Q*, which limits the upward movement of the frame and roller. A light coil-spring *k* is also shown as provided on the lower end of said screw to act as an additional means of pressing the rollers together.

In the machine as thus constructed the marks impressed upon the paper comprise a succession of dots or short dashes which are formed at the point of intersection of the type-bars with the sharp upper edge of the platen-bar *H*, it being obvious that when any key-bar is depressed it will bring the ink-ribbon and paper into contact with each other at such intersection, but not elsewhere, and will consequently leave the mark of the ribbon upon the paper at this point. The type-bars may of course have specially-formed or type projections at the points where the platen-bars come in contact with the same, but as herein shown said type-bars have their printing edges slightly extended in the form of an angular projection or ridge which acts in connection with the opposing angle or edge of the platen-arm to impress a dot on the paper. As herein shown, the type-bars *S* are seven in number, and the result of depressing them at once would be to leave seven dots on

the paper, arranged in a straight line above the position occupied by the adjacent platen-bar at the time the keys were depressed. The depression of the type bar or bars will also have served to advance the platen-bar one step, as hereinbefore described, and the dots formed at the next depression of the keys will be located in a line lying nearly parallel with and closely adjacent to the line of dots last previously formed.

The several dots formed by the repeated impact of each one of the type-bars upon the platen-bar as it moves across the machine beneath the sheet will lie in a transverse line which would extend across the paper directly beneath that type-bar if the paper remained stationary during such operation. Owing to the continuous forward movement of the paper, however, each dot will commence to move away from its type-bar from the moment of its formation, and each dot will move a slightly-greater distance away from its bar than the next succeeding dot, so that the line as a whole will extend at an angle to said bar. In order, therefore, that the several parallel lines of dots may extend transversely across the paper at right angles to its side edges and line of movement, the several type-bars *S* are herein shown as arranged obliquely, or with their right-hand ends (looking in the direction of the line of movement of the sheet) advanced beyond their left-hand ends by a distance equal to the distance traversed by the sheet in the passage of a platen-bar beneath the full length of the type-bars. This difference is in practice slightly greater than the width of the entire bank of type-bars, and the several dots produced by the impact of the type-bars upon the next succeeding platen-bar (which, as before stated, enters beneath the type-bars just as the previous platen-bar passes from beneath them) will in consequence be located below the lines of dots just previously impressed, or, in other words, will form a separate band or zone of dots or characters extending across the page and constituting another reading-line.

With a machine operating as above described it is therefore only necessary for the operator to continue to strike the keys in proper succession in order to print any amount of copy in separate lines extending transversely across the sheet at right angles to the edges thereof, as in ordinary type-written or printed matter, without stopping to set back the paper-carriage at the end of each line or to set back or relocate any other part of the machine or for any purpose whatsoever, it being obvious that as long as the machine is operated the several platen-bars will continue to present themselves in regular rotation to the action of the type-bars and in connection with the continuous forward movement of the paper will automatically effect the commencement of each new line of reading matter as the previous line is completed. The advantage of this operation in

relieving the operator of all care in the matter of resetting the carriage at the end of each line for the beginning of the line following will be obvious and is especially noticeable in stenographic machines where the accurate following of rapid dictation will ordinarily require the operator's utmost efforts in the manipulation of the keys, so that unless the machine is otherwise entirely automatic in its action it would frequently be impossible to follow the speaker perfectly.

The copy produced by the machine will obviously be similar to ordinary type-written matter in the general arrangement on the sheet, and since the sheet is of considerable width such copy will be so condensed or "solid" that the operator will be able at a glance to cover a considerable amount of matter and thus readily determine any point at which it is desired to make an erasure or insertion, and in this respect my improvements show a great advantage over previous stenographic machines that printed in a continuous line running longitudinally of a narrow strip or tape, which required to be examined by the yard in order to locate any particular point in the notes.

As the dots formed by the simultaneous depression of two or more of the type-bars will always be located in a line lying directly above the portion occupied by the platen-bar at the moment the keys were struck, it will be obvious that the successive lines of dots thus determined will not, in the construction described, lie exactly parallel with the others, but will have a radial relation to the central axis about which the said platen-bars rotate. In Figs. 5, 6, and 7, however, I have shown a construction somewhat modified from that previously illustrated and in which the several positions occupied by each platen-bar during the operative position of its rotation lie parallel to each other, and consequently produce a similar relation in the consecutive lines of dots. In said figures the platen-bars are rigidly secured to the upper ends of vertical spindles v' , which are journaled in the outer ends of the radial arms F. The lower ends of said spindles are provided with crank-arms s' , the crank-pins s^2 of which are adapted to engage a stationary curved guide t . A spiral spring u , applied to each spindle v , serves to normally maintain the crank-pin in contact with the guide t , and the latter is so arranged that the engagement of the crank-pin therewith serves to gradually turn the platen-bar on its spindle v , so as to maintain the parallelism of the consecutive positions it assumes as the arm F moves forward in its rotation.

In Figs. 3 and 4 I have shown a construction in which the platen n consists of a flat plate which extends under all of the type-bars S throughout their entire length. Said type-bars S do not in this case impinge directly upon the platen, but are adapted to severally op-

erate through a series of vertical pins o , that are movably mounted in the ends of the radial arms F. The type-bars are concentrically curved about the axis of the hub E as a center, and the several pins o are consequently always exactly beneath the type-bars throughout the travel of the arms F beneath the entire length of the said bars. Light spiral springs p normally hold the pins o elevated above the surface of the platen n , upon which the paper is laid, but whenever one of the type-bars is depressed it forces down the subjacent pin o upon the paper. An inking-ribbon will be passed between the lower ends of the pins and the paper, and the latter will thus be marked by a dot whenever the type-bar is depressed. The copy produced by a machine constructed in this manner will obviously be substantially similar to that produced by the machine as first described, except that it will occupy curved instead of straight lines, and the operation of the machine otherwise than in the matters stated will be the same in both cases. The several movable pins $o o$ in connection with a stationary continuous flat plate or platen n obviously perform the same functions as the bodily-movable or shifting platen-bars or anvils shown in the other figures of the drawings, inasmuch as said pins constitute merely a means for transmitting the pressure of the printing-bars to the paper, and it is to be understood that this construction is included in and covered by the term "impressing device" employed in the appended claims.

In Fig. 12 I have shown a further modification in which the type-bars S^4 are arranged at right angles to their supporting-arm S^3 , the oblique arrangement of the bars with reference to the paper h' being in this case secured by feeding the paper along in an oblique direction by an appropriate arrangement of the feed mechanism therefor. Obviously, however, the operation of a machine so constructed in securing the horizontal or right-angular arrangement of the printed lines upon the sheet will be precisely the same as in the construction previously shown.

It will also be understood that many of the principles of construction embodied in the stenographic machines herein illustrated may also be applied in the construction of typewriting machines which print letters and words in the usual manner, and all such and similar modifications are to be understood as included in the spirit of my invention.

I claim as my invention—

1. The combination with a plurality of printing-bars extending across the paper transverse to its path of movement and along the line of writing, each of said bars being constructed to act in making impressions at a series of separate points along the bar, of an impressing device which moves along the printing-bars in the act of printing, the construction being such that impressions will be

made in succession by the action of separate points on the printing-bars, substantially as described.

2. The combination with a plurality of printing-bars which extend across the paper transversely to its path of movement and along the line of writing, each of said bars having a plurality of printing-points adapted to print identical marks or characters, of an anvil which moves along the printing-bars and which acts in connection with the same to print successively from the printing-points of said bars, substantially as described.

3. The combination with a plurality of printing-bars extending across the path of the paper and each being adapted to act in printing at a series of separate points along the bar, of an inking-ribbon and an impressing device which moves along the bars, the construction being such that the ribbon and paper will be forced into contact with each other by the action of separate points on the printing-bars, substantially as described.

4. The combination with a plurality of movably-mounted printing-bars which extend across the path of the paper and each of which is provided with a plurality of printing-points, of an inking-ribbon and a rotary part carrying movable anvils adapted to move along the type-bars, the construction being such that the printing-points of the bars will act successively in the operation of printing, substantially as described.

5. The combination with a plurality of movably-mounted printing-bars which extend across the path of the paper, and each of which is provided with a plurality of printing-points, means for advancing the paper at each impression, and shifting anvils movable along the bars, substantially as described.

6. The combination with a plurality of movably-mounted printing-bars extending across the path of the paper, and an inking-ribbon, of a plurality of movable anvils arranged transversely of the printing-bars on the opposite side of the paper therefrom, said anvils being movable along the printing-bars, substantially as described.

7. The combination with a plurality of movably-mounted printing-bars extending across the path of the paper, and each having a plurality of printing-points, of an inking-ribbon, means for advancing the paper at each impression, and a plurality of shifting anvils arranged transversely of the printing-bars on the opposite side of the paper therefrom, said anvils being movable along the printing-bars, substantially as described.

8. The combination with a plurality of movably-mounted printing-bars which extend obliquely across the path of the paper, of a plurality of shifting anvils arranged transversely of the printing-bars on the opposite side of the paper therefrom, said anvils being moved along the printing-bars, and means for advancing the paper at each movement of the printing-bars, substantially as described.

9. The combination with a plurality of movably-mounted printing-bars, of a pivotally-supported anvil arranged transversely of the printing-bars, means for moving the anvil along the printing-bars at each movement of one of the latter, and means for advancing the paper between the printing-bars and the anvil at each impression, substantially as described.

10. The combination with a plurality of movably-mounted printing-bars, of a plurality of movably-mounted anvils spaced at distances apart substantially equal to the length of the printing-bars, means for moving the anvils along the printing-bars in succession, and means for feeding the paper between the anvils and printing-bars, substantially as described.

11. The combination with a plurality of movably-mounted printing-bars, and an inking-ribbon, of a rotary part having a plurality of anvils mounted thereon, means for giving rotary movement to said part as the printing-bars are moved, and means for feeding the paper between the printing-bars and anvils, substantially as described.

12. The combination with a plurality of movably-mounted printing-bars, of a rotary part having a plurality of anvils mounted thereon and spaced at distances apart substantially equal to the length of the printing-bars, means for giving rotary movement to said part to carry the anvils along the printing-bars in succession, and means for feeding the paper between the anvils and printing-bars, substantially as described.

13. The combination with a plurality of movably-mounted printing-bars extending obliquely across the path of the paper, of a rotary part having a plurality of anvils mounted thereon, means for giving rotary movement to said part as the printing-bars are moved, and means for simultaneously feeding the paper between the printing-bars and anvils, substantially as described.

14. A type-writer or the like provided with a plurality of printing-bars which extend across the path of the paper, and each of which is provided with a plurality of printing-points, arms pivotally supporting said printing-bars, an inking-ribbon, and an impressing device movable along the printing-bars, the construction being such that the ribbon and paper will be forced into contact with each other by the successive action of the printing-points on the bars, substantially as described.

15. A type-writer or the like, provided with a plurality of printing-bars which extend across the path of the paper and are provided at their ends with rearwardly-extending supporting-arms, said printing-bars each having a plurality of printing-points, transverse pivots on which said supporting-arms are mounted, an inking-ribbon and an impressing device moving along the printing-bars, the construction being such that the ribbon and paper will be forced into contact by the succes-

sive action of the printing-points on the bars, substantially as described.

16. A type-writer or the like provided with a plurality of printing-bars which extend across the path of the paper and are provided at their ends with rearwardly-extending arms, each printing-bar having a plurality of printing-points, transverse pivots on which said supporting-arms are mounted, the pairs of supporting-arms being spaced at different distances apart and the several arms and bars being arranged one within the other, an inking-ribbon, and an impressing device moving along the printing-bars; the construction being such that the ribbon and paper will be forced into contact with each other by the successive action of the printing-points on the bars, substantially as described.

17. A type-writer or the like provided with a plurality of printing-bars each of which extends across the paper, radial arms supporting said printing-bars, an anvil arranged transversely of the printing-bars, an inking-ribbon between the printing-bars and anvil, means for feeding the paper forward at each impression, a pivotally-supported frame to which said radial arms are pivoted, and ribbon-supports also secured to said frame, whereby the printing-bars and ribbon may be together swung back away from the work, substantially as described.

18. A type-writer or the like provided with a plurality of printing-bars, radial arms pivotally supporting said printing-bars, an inking-ribbon, a pivoted part having an anvil mounted thereon, a space-bar extending transversely beneath the printing-bar-supporting arms, a rock-shaft on which said space-bar is pivotally mounted, a pawl secured to an arm on said rock-shaft, and a ratchet on said anvil-supporting part adapted to be engaged by said pawl, substantially as described.

19. A type-writer or the like provided with a plurality of movably-mounted printing-bars, spools journaled at the opposite ends of said bars, an inking-ribbon wound on said spools, toothed wheels secured to the spool-shafts, ratchet-wheels located adjacent to said toothed wheels and provided with wrist-pins adapted to engage the teeth of the toothed wheel once in each revolution of the ratchet-wheels, a movably-mounted space-bar, and pawls connected with said bars and adapted to engage said ratchet-wheels to feed the ribbon along, substantially as described.

20. A type-writer or the like provided with

a plurality of printing-bars, radial arms pivotally supporting said printing-bars, ribbon-spools journaled at opposite ends of the printing-bars, ratchet-wheels operatively connected with said spools, an inking-ribbon wound on the spools, a space-bar extending transversely beneath the printing-bar-supporting arms, and pawls connected with said radial arms and adapted to engage the ratchet-wheels, substantially as described.

21. A type-writer or the like provided with a plurality of printing-bars, arms supporting said printing-bars, a pivotally-supported frame to which said arms are pivoted, bracket-arms secured to said frame, spools mounted in said bracket-arms at opposite ends of the printing-bars, ratchet-wheels operatively connected with said spools, an inking-ribbon wound on said spools, a space-bar extending transversely beneath the printing-bar-supporting arms, radial arms pivotally supporting said space-bar, and pawls on said radial arms adapted to engage said ratchet-wheels, whereby the printing-bars and inking-ribbon and their supports may be raised together from the work, substantially as described.

22. A type-writer or the like provided with a plurality of movably-mounted printing-bars, a pivoted part having an anvil supported thereon, means for imparting rotary movement to said part to feed the anvil along the printing-bars as the latter are actuated, and means for feeding the paper between the printing-bars and anvil comprising feed-rollers and gearing between said rollers and the rotary part, substantially as described.

23. A type-writer or the like provided with a plurality of movably-mounted printing-bars, a pivoted part having an anvil supported thereon, means for imparting rotary movement to said part to feed the anvil along the printing-bars as the latter are actuated, and means for feeding the paper between the printing-bars and anvil comprising upper and lower rollers, gear-teeth on the pivoted part, an intermeshing gear adapted to be rotated thereby, and bevel-gear connecting said gear with one of the rollers, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 27th day of July, A. D. 1895.

JOHN F. HARDY.

Witnesses:

C. CLARENCE POOLE,
ALBERT H. GRAVES.