

(No Model.)

3 Sheets—Sheet 1.

R. HERTZBERG.
TYPE WRITING MACHINE.

No. 579,433.

Patented Mar. 23, 1897.

FIG: 1.

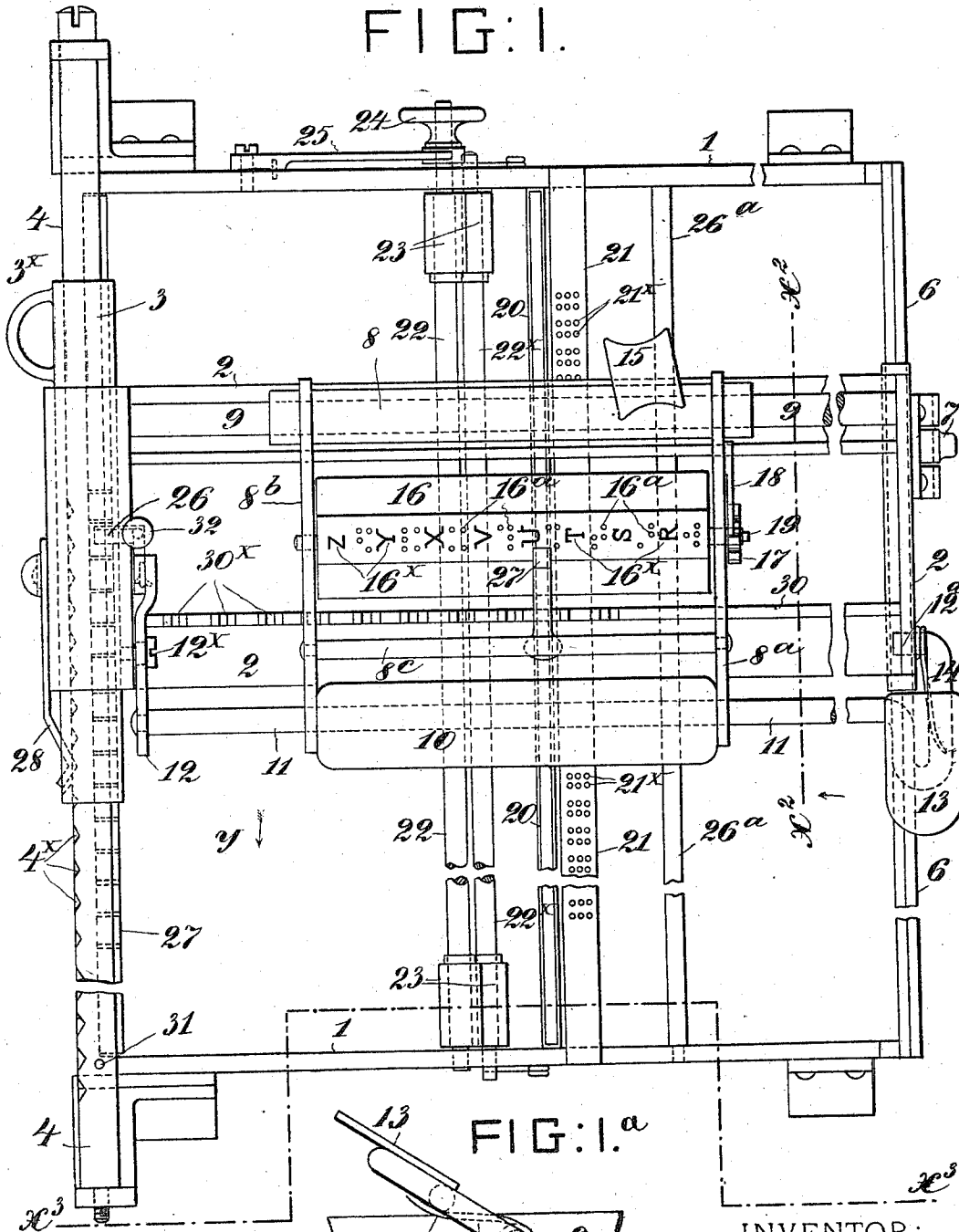
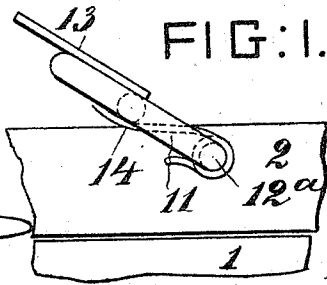


FIG: 1. a

WITNESSES:

J. W. Wiman
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INVENTOR:

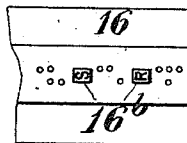
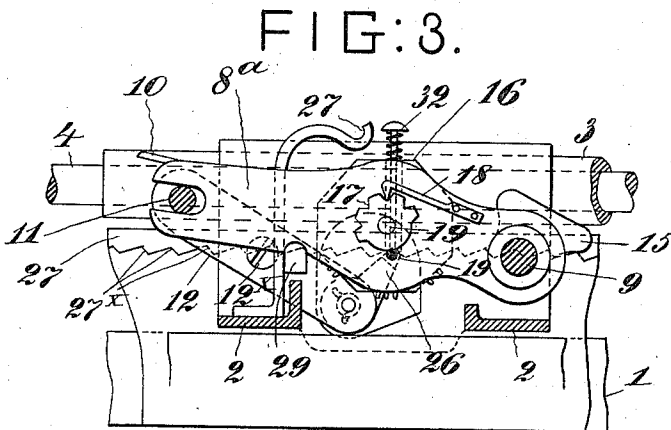
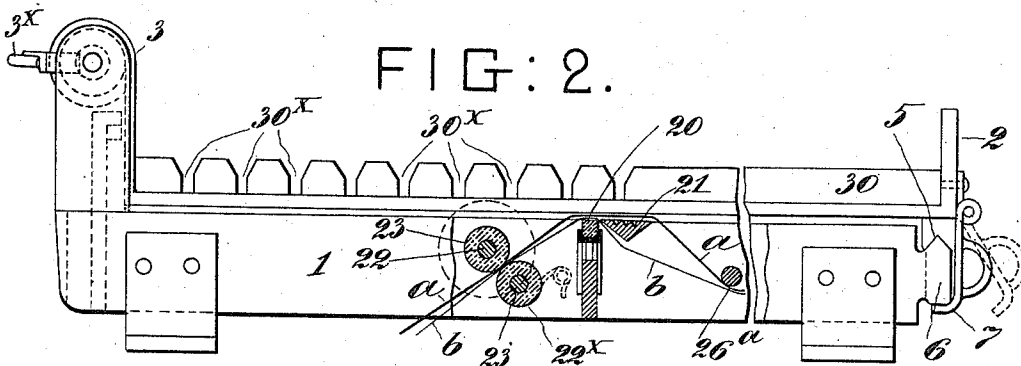
Rafael Hertzberg

By *Henry Combs*
Attorney.

3 Sheets—Sheet 2.

No. 579,433.

Patented Mar. 23, 1897.



J. H. Whiman
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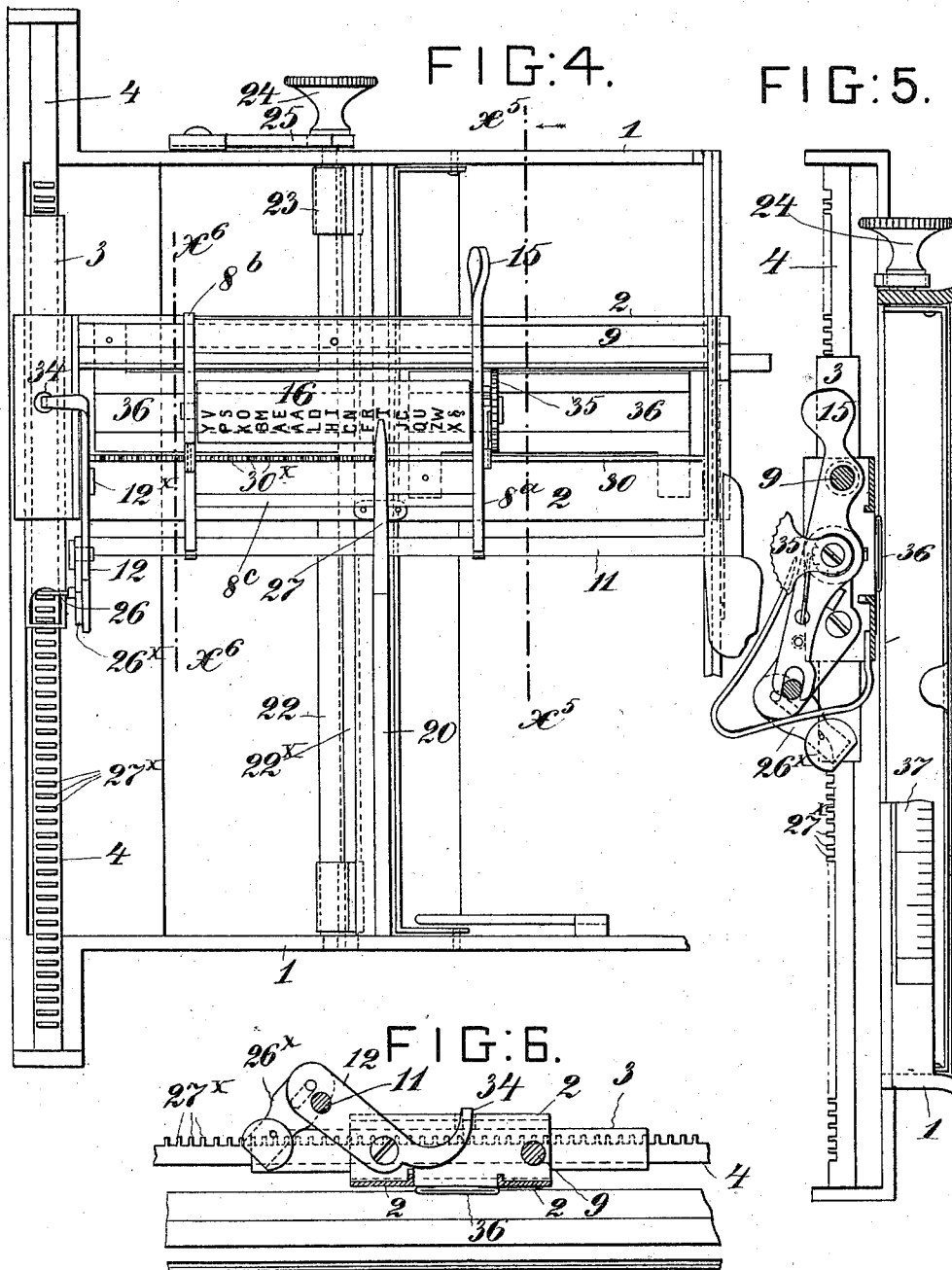
(No Model.)

3 Sheets—Sheet 3.

R. HERTZBERG.
TYPE WRITING MACHINE.

No. 579,433.

Patented Mar. 23, 1897.



WITNESSES:

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UNITED STATES PATENT OFFICE.

RAFAËL HERTZBERG, OF HELSINGFORS, FINLAND.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 579,433, dated March 23, 1897.

Application filed March 20, 1895. Serial No. 542,456. (No model.) Patented in Finland March 30, 1894, No. 503.

To all whom it may concern:

Be it known that I, RAFAËL HERTZBERG, a subject of the Grand Duke of Finland, and a resident of Helsingfors, in the Archduchy of Finland, have invented certain new and useful Improvements in Type-Writing Machines, (for which a patent has been granted to me in Finland, No. 503, dated March 30, 1894,) of which the following is a specification.

This invention relates to a type-writing machine which is adapted for printing characters of the ordinary kind and also those used by the blind. The two kinds of characters may be written simultaneously, or the machine may be set or constructed so as to produce either.

The invention will be fully described hereinafter and its novel features carefully defined in the claims.

In the accompanying drawings, Figure 1 is a plan of an embodiment of the machine as adapted for writing with both kinds of characters simultaneously. Fig. 1^a is a fragmentary view showing the spring for upholding the type-carrier. Fig. 2 is a section on line x^2x^2 in Fig. 1. Fig. 3 is a section on line x^3x^3 in Fig. 1, the upper part of the machine being omitted. Fig. 3^a is a fragmentary under side view of the type-carrier. Fig. 4 is a plan of the machine as arranged for writing with the ordinary characters only. Fig. 5 is a section on line x^5x^5 of Fig. 4. Fig. 6 is a section on line x^6x^6 of Fig. 4.

I will first describe the machine as shown in Figs. 1, 2, and 3.

1 is the main frame of the machine, the front of which is seen at the right in Fig. 1. On this frame is mounted a sliding carriage 2, which moves, in printing or writing, from the right to the left of the user, as indicated by the arrow y in Fig. 1. I may say here that this carriage 2 feeds along, letter by letter, in writing, and that it is hinged at the rear side and turns back on its hinge. On the rear side of the carriage is a hinging-sleeve 3, which fits and slides on a cylindrical hinging-bar 4 on the machine-frame. At its front or free edge the carriage 2 has a groove 5, which fits on a bar 6 on the main frame, and a latch-hook 7, (seen at right in Fig. 2,) which takes under said bar and holds the carriage down in place

thereon. The dotted lines in Fig. 2 show the hook 7 disengaged.

On the carriage 2 is mounted a slide-frame consisting of a sleeve 8, mounted to slide on a cylindrical bar 9, fixed in the carriage 2 and extending transversely of the same, and of two plates 8^a and 8^b, fixed to the sleeve 8. These plates are or may be connected by a tie 8^c and a pressure-plate 10. Being hinged at the right-hand side of the user on the bar 9, the free left-hand side of the slide-frame is supported on a crank-bar 11, mounted in the carriage 2, and arranged parallel with the bar 9. This crank-bar 11 engages or occupies slots or apertures in the ends of the plates 8^a and 8^b, as seen in Fig. 3, and is fixed at one end in a lever 12, fulcrumed at 12^x on the carriage 2, while at the other end (the right in Fig. 1) it is bent or cranked and pivoted at 12^a in the carriage at a point opposite the fulcrum 12^x. On this cranked end of the bar 11 is fixed a pressure-plate 13, and under said cranked end is a spring 14, (see Fig. 1^a,) which holds the free side of the slide-frame elevated normally. On the said slide-frame is a thumb-piece 15, by which said frame may be conveniently moved to and fro, from front to rear, and vice versa, on the bars 9 and 11.

In the slide-frame and rotatively mounted in the plates 8^a and 8^b is a cylindrical or polygonal type carrier or roller 16, here shown as octagonal in cross-section. On the four uppermost or index faces of this roller are marked the letters of the alphabet and the other ordinarily-used characters 16^x, say thirty-two in number, extending lengthwise of the respective faces on the roller, eight on each face, and adjacent to each such letter or character the corresponding letter or character 16^a, formed by projecting pins arranged according to the point-alphabet for the blind of Braille system. On the corresponding lower or printing faces of the roller are arranged printing-types 16^b, Fig. 3^a, and pins, each character on the lower faces corresponding to the like character on the opposite upper faces.

On one journal of the roller 16 (see Fig. 3) is a disk 17, having four notches adapted to be put in engagement with a spring-detent 18, whereby when either of the four index-

faces of the roller are turned up the detent 18 will fall into a notch in the disk 17 and hold the roller steady in the position set. To prevent the roller from being turned more than half-way round, a pin 19, set in the plate 8^a, is made to engage shoulders on the disk 17 and serve as a limiting-stop.

I may say here that the characters of the Braille alphabet will be formed by projecting pins on both the upper index-faces and lower printing-faces of the roller, but the ordinary characters of the alphabet need not be represented by types in relief on the upper faces of the roller. In Fig. 1 I have not deemed it necessary to show the characters 16^x and 16^a on any but the extreme upper face of the roller 16, as these will serve to fully explain the arrangement and construction. It will be understood that the printing-types need not have faces so large as the letters 16^x in Fig. 1.

Under the roller 16 are fixed in the main frame bars 20 and 21, the former to receive the impression from the ordinary types on the roller 16 and the latter to receive the impression from the pins forming the letters of the alphabet for the blind. This latter bar has in it sockets 21^x, arranged in groups of six, according to the fundamental sign in the point-alphabet of Braille. The pins forming the letter on the roller press the paper down into these sockets, thus forming embossed points on the under side of the paper resting on the bar 21.

The paper holding and feeding mechanism comprises two shafts 22 and 22^x, mounted rotatively in the main frame 1 and provided with rubber facings or sleeves 23 to clamp on the sheet of paper passed between them. One of these shafts is provided with a button 24 for rotating it in feeding, and a spring 25 on the frame presses on the boss of this button and serves to hold the shafts steady. Fig. 2 shows how the sheet of paper *a* passes between the shafts 22 and 22^x, over both of the impression-bars 20 and 21, and then under a clearing-bar 26^a in the frame. Under the sheet of paper *a* is a carbon-sheet *b*, which passes over the impression-bar 20 only.

So far as described the operation is as follows: The operator inserts the paper in the manner last described and moves the carriage 2 over to his right as far as it is designed to go. He then moves the slide-frame, carrying the type-roller transversely on the carriage until he brings the proper letter or character thereon opposite an index 27 on the carriage, turning the roller, as required, to bring that face thereof which bears the proper letter uppermost. He may move the slide-plate by grasping the thumb-piece 15 with his thumb and middle finger and rotating the roller into position simultaneously with his index-finger. He then presses the type-roller 16 down upon the paper with his left hand, which is applied to the pressure-plate 10. The letter-feed or movement of the carriage

along the main frame is effected by the following-described mechanism: On the arms of the lever 12, opposite to that to which the bar 11 is secured, is mounted an upwardly-projecting spring feed-pawl 26, which engages teeth 27^x in the lower face of a flange 27 on the side plate of the main frame, and when the slide-frame which carries the type-roller is depressed to effect the printing the first part of the movement serves to feed the carriage 2 along through the medium of the crank-bar 11, lever 12, and pawl 26. This movement will be completed before the types touch the paper, and the proper equal spacing for the letters, as well as the steadying of the carriage during the impression, is effected by a spring-detent 28 on the carriage (seen at the left in Fig. 1) engaging one of a series of V-shaped notches 4^x in the bar 4. The exact alinement of the types in printing is assured by means of a tooth 29 on the side plate 8^a, (seen in Fig. 3,) which, as the slide-frame descends, engages one of a series of notches 30^x in a bar 30 in the carriage 2. The notches 30^x are flared, so that if the letter on the type-roller be not brought exactly to the index 27 the entry of the tooth 29 into the notch will correct the alinement. A thumb-piece 3^x on the sleeve 3 enables the carriage to be lifted and turned about its hinging-point conveniently. The spacing between words may be effected by pressing down the slide-frame far enough to cause the carriage to feed along, but not far enough to effect the printing, and the feeding of the paper, after finishing a line, is effected by means of the button 24.

When a blind operator uses the machine, he may apply the thumb of his right hand to the thumb-piece 15 and feel with the fingers of that hand for the proper letter on the roller, turning the latter, as required, to bring the proper letter uppermost. He then brings the letter he has found to the index 27 and presses on the pressure-plate 13 with his left hand. To warn him when he has reached nearly the end of the line, the machine has a stop device consisting of a pin 31, Fig. 1, which fits loosely in a hole in the bar 4 and stops the carriage 2 when there is still room left for a few letters—say five—on the line.

The carriage can be turned fully back, so as to afford room for inserting the paper, and this movement will disengage the feed-pawl 26 from the teeth 27^x, but in order to depress the pawl 26 out of engagement with the teeth 27^x, so that the carriage 2 may be moved back, a spring push-pin 32 is employed.

If the machine is to be used for writing only for the blind, the bar 20 may be removed, and no carbon-paper will be required, and if it is to be used for writing only for those who see the bar 21 may be removed. These bars 20 and 21 may be, of course, secured removably in the frame.

As the machine described above is arranged the writing proceeds from right to left, but

as the printing or writing appears on the under side of the paper the matter will read from left to right when the sheet is turned over.

5 Figs. 4, 5, and 6 illustrate an embodiment of the machine adapted for writing only with ordinary type and not with pins. In this form of the machine the arrangement is such that the writing proceeds from left to right
10 of the operator, and the letters appear on the upper face of the sheet. In this construction the pawl 26, which feeds the carriage, is reversed in position, and the teeth 27^x it engages are formed on the bar 4. The pawl 26
15 in this case is a pin that projects out at right angles from an arm 26^x, which has a slotted connection with the arm of the lever 12, to which the crank-bar 11 is secured. The other arm of the lever 12 extends out over the
20 sleeve 3 and has on its end a downwardly-projecting nose 34, which extends down through an aperture in the sleeve and is adapted to normally engage the teeth 27^x. This pawl prevents any movement of the carriage 2 while the roller 16 is being adjusted. When the slide-frame is pressed down to effect the printing, the nose 34 is lifted out of engagement with the teeth, and the pin of the pawl 26 descends between two of the teeth 27^x
30 and advances the carriage to the extent of one tooth. In consequence of the slotted connection of the arm 26^x with the lever 12 the carriage cannot move backward during the pressing down of the slide-frame. The roller 16 in this construction is represented as cylindrical and as provided with a milled plate or partial disk 35, whereby said roller may be conveniently turned with the finger. The roller of the first-described machine might
35 also have such a milled plate.

It is designed in using this machine to ink the types on the roller with color-pads in lieu of using a ribbon or carbon-paper. To this end I arrange under the roller 16 two such
45 pads 36, which are alined and extend lengthwise of the roller and abut at the impression bar or plate 20. I prefer in this form of the machine to bring the teeth on the bar 30 up to a point. In the machine for use by the
50 blind it is best to have them blunt, as in Fig. 3, in order that the operator may be unable to depress the slide-frame unless he brings the letter on the roller up into pretty accurate register with the index 27. A scale 37 on the
55 main frame, Fig. 5, serves to assist the operator in setting the carriage for starting the line or for indenting. The pin 31 is arranged at the end of the machine at the right hand of the operator. Otherwise than as above described the operation of this form of the machine is the same as that first described.

I may explain here that the object in providing the long shafts 22 and 22^x of the feed mechanism with sleeves 23, of rubber or like
65 soft material, at their ends only is that these sleeves may grasp the sheet *a* only at its mar-

gins, and thus leave the embossings made by the pins intact. I may also say that while I prefer to consider the side of the machine at the right in Fig. 1 as the front this is really
70 only a matter of personal choice. The letters 16^x on the type-carrier 16 may be turned about so as to read properly from either side of the machine.

Having thus described my invention, I
claim—

1. A type-writing machine, having a recessed support 21 for the sheet, means for feeding the sheet, an index, and a vertically movable and shiftable type-carrier arranged
80 over the sheet-support, said type-carrier being provided on its lower half with types adapted to enter the recesses in the support 21 and emboss characters on the sheet, and said carrier also provided on its upper half
85 with characters corresponding to those for embossing, these characters on the upper half of the carrier serving as guides for adjusting the type-carrier in printing, substantially as set forth.

2. A type-writing machine, having a support for the sheet, means for feeding the sheet, an index, and a rotatable type-carrier mounted on end journals, said carrier being also
90 vertically movable and provided on its lower half with types for forming letters or characters on the sheet by pressure, and on its upper half with characters which serve as guides for adjusting the type-carrier, substantially as set forth.

3. In a type-writing machine, the combination with the main frame, having the ratchet-teeth 27^x, the sliding carriage mounted on said frame, and the slide-frame hinged on the bar 9 in the carriage, of the crank-bar 11, mounted
105 in the carriage and engaging the free end of the slide-frame, the lever 12, fulcrumed on the carriage, and the spring, feed-pawl, 26, carried by said lever and engaging the teeth 27^x, one end of the crank-rod 11 being fixed
110 to said lever 12, substantially as and for the purposes set forth.

4. A type-writing machine, having a support 20 and recessed support 21, for the sheet, means for feeding the sheet, and a vertically
115 movable and shiftable type-carrier arranged over said sheet-supports, said type-carrier being provided with types 16^b, and adjacent to these, types formed of pins arranged so as to form the corresponding characters of the al-
120 phabet for the blind, whereby the two characters may be printed simultaneously on the sheet, one in color, for those who see, and one embossed for the blind, as set forth.

In witness whereof I have hereunto signed
125 my name in the presence of two subscribing witnesses.

RAFAEL HERTZBERG.

Witnesses:

JOHN SVANLJUNG,
WILES POPPINS.