

(No Model.)

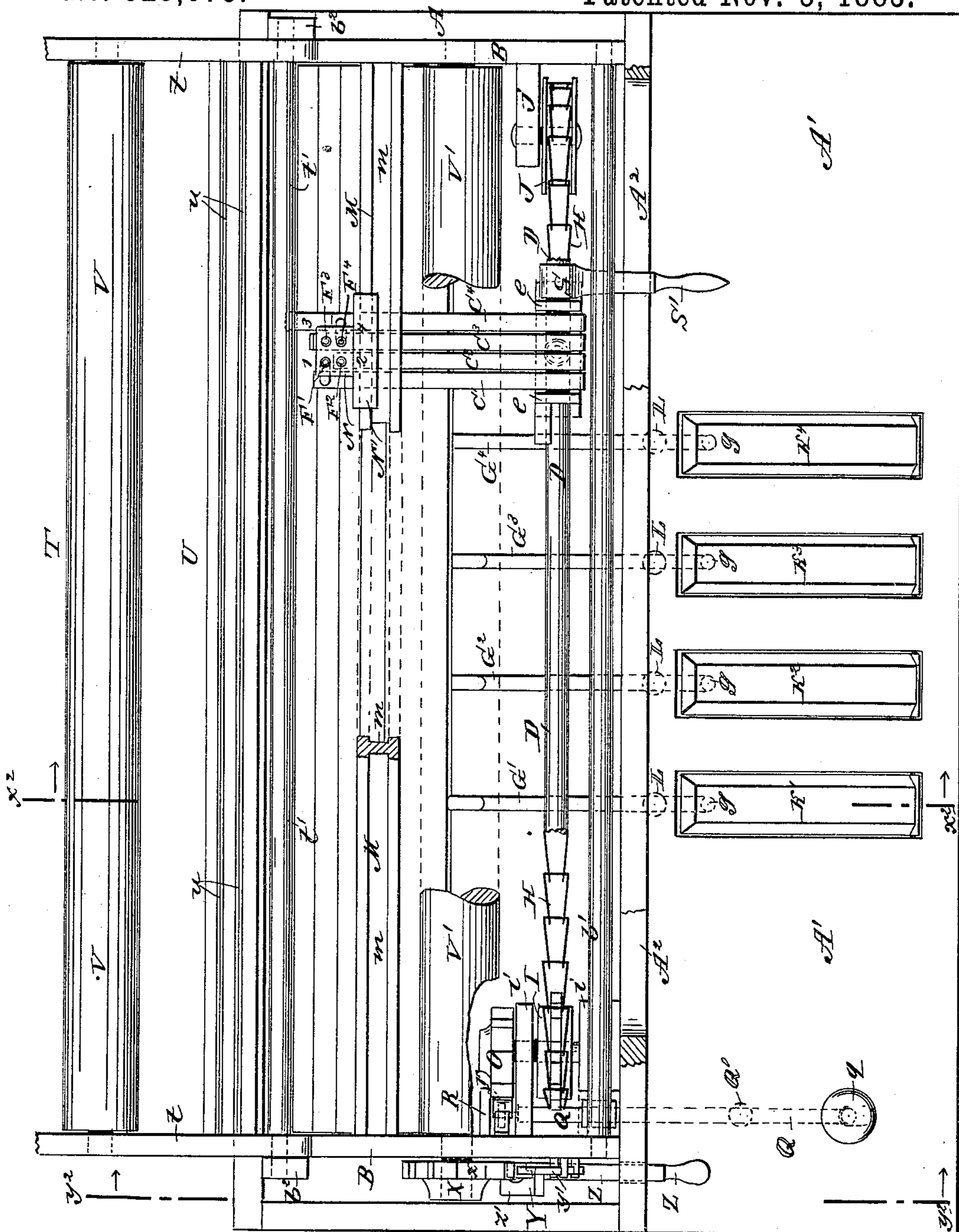
3 Sheets—Sheet 1.

W. H. PERKINS.

WRITING MACHINE FOR THE BLIND.

No. 329,675.

Patented Nov. 3, 1885.



WITNESSES:

Hotz Beyer
C. Sedgwick

Fig. 1.

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(No Model.)

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Fig. 2.

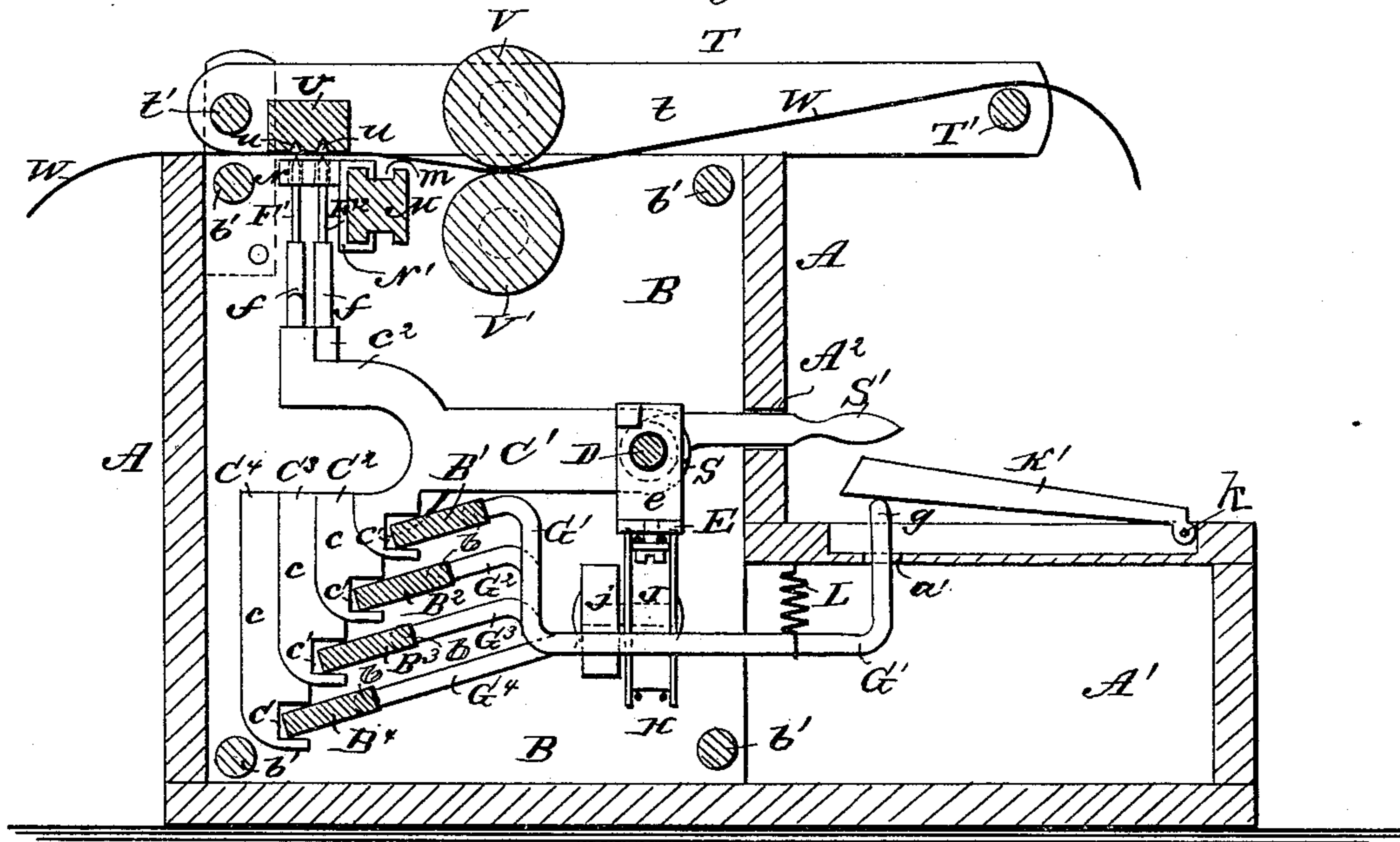
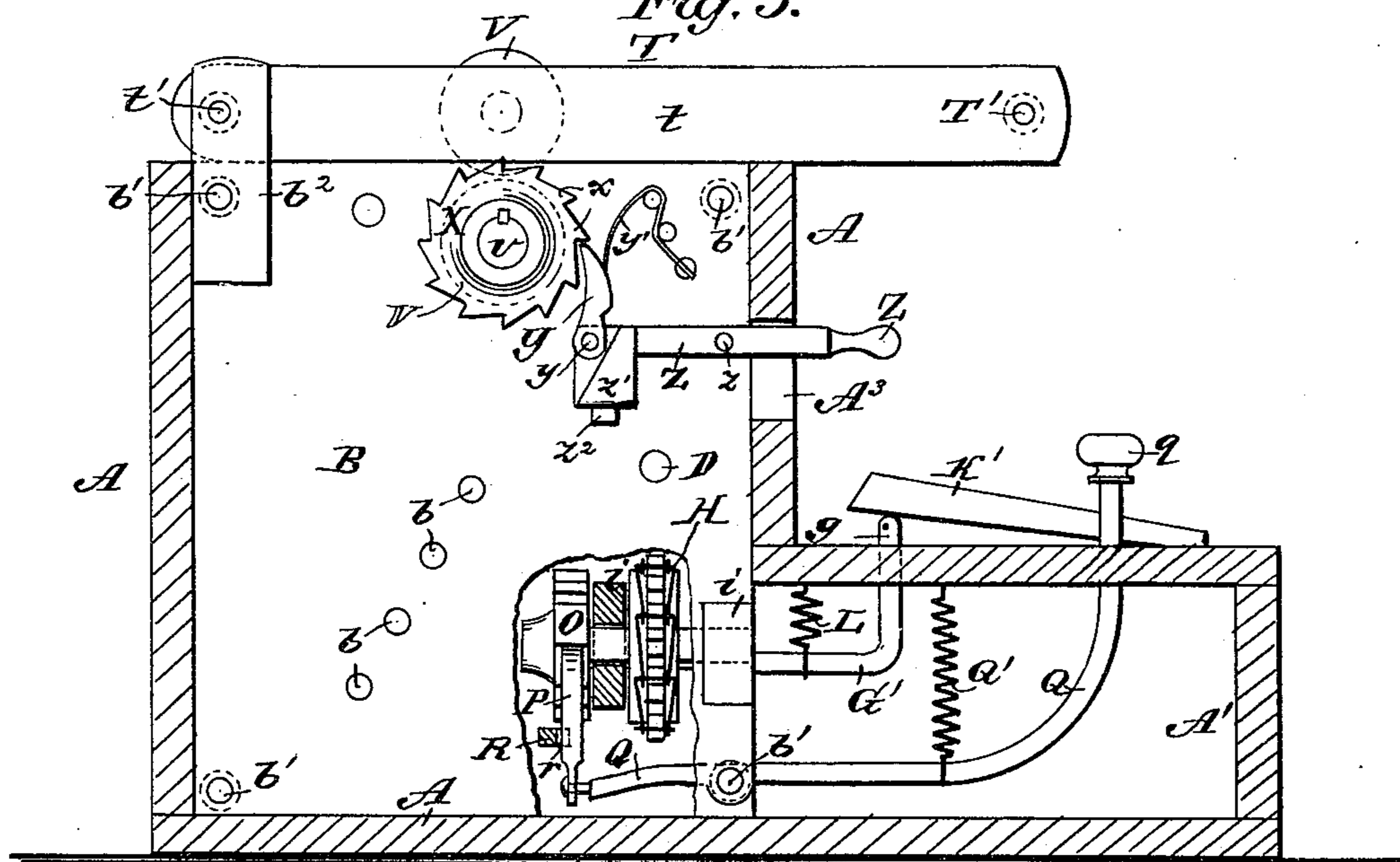


Fig. 3.



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3 Sheets—Sheet 3.

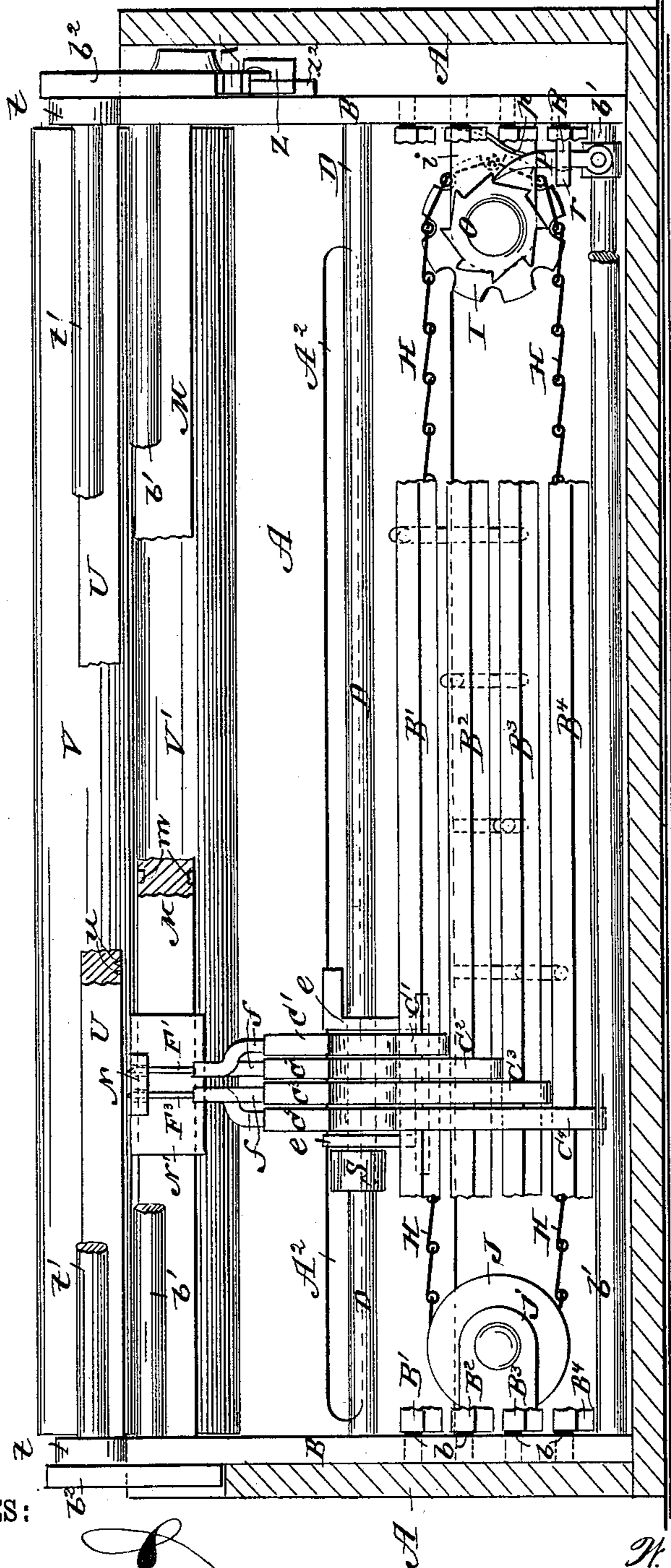
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Fig. 4.



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INVENTOR:

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UNITED STATES PATENT OFFICE.

WILLIAM H. PERKINS, OF OWENSBOROUGH, KENTUCKY.

WRITING-MACHINE FOR THE BLIND.

SPECIFICATION forming part of Letters Patent No. 329,675, dated November 3, 1835.

Application filed August 2, 1884. Serial No. 139,479. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. PERKINS, of Owensborough, in the county of Daviess and State of Kentucky, have invented a new and Improved Writing-Machine for the Blind, of which the following is a full, clear, and exact description.

The object of my invention is to provide an improved writing-machine for the blind, whereby writing in embossed characters by puncturing sheets of paper may be performed much more expeditiously than can be done with the usual hand-slate and stiletto, and whereby, also, the embossed characters will be formed in the order in which they are read and in accordance with the code of characters usually employed.

The invention consists of the sundry combinations of parts and their construction, substantially as hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of my improved writing-machine with parts broken away. Fig. 2 is a cross-sectional elevation taken on the line $x^2 x^2$, Fig. 1. Fig. 3 is a like view taken on the line $y^2 y^2$, Fig. 1; and Fig. 4 is a rear elevation, partly broken away and with the case in section.

The letter A indicates a suitable case, in which most of the mechanism of the machine is contained. The case has no cover, and has a forward extension, A', at the base, in or on which the operating-keys of the machine are arranged, as hereinafter described.

The letters B' B² B³ B⁴ indicate flat bars, which are pivoted at each end to the end frames, B B, on pins b , which are placed next the forward edges of the bars, so that when the bars are rocked on their pivots the back edges of the bars will rise and fall. Tie-rods b' connect the end frames, B B, with each other. The bars B' B² B³ B⁴ are arranged successively below and behind each other, so that the back edges of the bars may engage notches c' made in the front edges of the lower back portions, c , of the arms C' C² C³ C⁴, and so that the bars B' B² B³ B⁴ engage, respectively, the arms C'

C² C³ C⁴, these arms being mounted side by side on a rod, D, which ranges along the front of the case. The forward ends of the arms C' C² C³ C⁴ are held between the flanges or arms $e e$ of a plate or yoke, E, said arms $e e$ being bored to pass upon the rod D, and so that when the yoke E is moved along either way on the rod D the four arms C' C² C³ C⁴ will be carried with the yoke, while the notches c' of the arms will remain always in engagement with their respective bars B' B² B³ B⁴.

To the upper back portions, c^2 , of the arms C' C² C³ C⁴ are secured, respectively, the stems or shanks f of the writing-needles or stilettoes F' F² F³ F⁴, and the stems f of the needles are bent to permit the needles to be grouped together, so that their points shall be arranged in the form of a square, as represented in Fig. 1. The respective bars B' B² B³ B⁴ have key-rods G' G² G³ G⁴ fixed to them, and these key-rods are bent so as to range about in line to pass between the opposite sides of the endless chain H, which passes over opposite chain-wheels, I J, mounted, respectively, at the ends of the frame, and to which chain the yoke E is fastened, so that as the chain is carried along by the wheels I J the needle-carrying arms C' C² C³ C⁴ will be moved to the right or left along the rod D. The key-rods G' G² G³ G⁴, after passing between the sides of the chain H, extend forward within the extension A' of the case, and upward through holes a' thereof, to come by their ends g beneath the back ends of the four keys K' K² K³ K⁴, which are pivoted on pins k at their front ends, and so that when either of the keys K' K² K³ K⁴ is pressed down a corresponding needle, F', F², F³, or F⁴, will be raised, and springs L, connecting each key-rod with the case, will draw the raised needle-points back again beneath the top of the needle-plate N, and lift the depressed key or keys, ready for the next action.

M is a bar, which is fixed to the opposite end frames, B, to serve as a guide to the sliding needle plate N, which has the four rectangularly-arranged vertical holes 1 2 3 4, through which holes the needles F' F² F³ F⁴, respectively, pass. The needle F', connected to the key K', passes through the hole 1. The needle F², connected to the key K², passes through the hole 2. The needle F³, connected to the key

K^3 , passes through the hole 3, and the needle F^4 , connected to the key K^4 , passes through the hole 4. I have shown the needle-plate N held to slide along the bar M by means of a sliding clip-plate, N' , which has flanges bent down or into opposite grooves, m , of the bar; but any desired means of holding the needle-plate to the bar which will permit the plate to slide either way with the needle-carrying arms and needles may be employed. It is not essential that the keys should operate the needles in the precise order described, as any one of the keys may be made to operate any one of the needles; but the arrangement shown is preferred. The chain-wheel J is journaled on a pin or stud fixed to a bracket-arm, j , secured to one of the end frames, B , and the opposite chain-wheel, I , is journaled in arms i , fixed to the other end frame, B . The shaft of the wheel I carries fixedly the ratchet-wheel O , the teeth of which may be engaged by a pawl, P , which is pivoted to the inner end of a lever, Q , and is forced inward to the ratchet-teeth by a spring, p . The lever Q is mounted loosely on one of the frame tie-bars b' , or any suitable stud fixed in the frame, and the outer arm of the lever passes forward into the extension A' of the case and up through it and receives a button or head, q , for operating it. As the head q of the lever Q is pressed down, the pawl P will move the ratchet-wheel O the space of one tooth, which will carry the chain-wheel I , chain H , and the yoke and connected needle-arms and needles to the right hand for a distance a little greater than the length of one side of the square outlined by the needle-points, to carry the needles forward to form the next character on any given line of characters by puncturing the paper held over the points of the needles, as hereinafter explained. An arm, R , is fixed to the end frame, B , so as to project by its shoulder r against the side of the pawl P which faces the ratchet-wheel, and so that when the head q of the lever Q is raised above its normal position the pawl P will be forced away from the teeth of the ratchet-wheel O to allow the chain-wheel to turn back as the chain and yoke E and needles connected to it are run back from the right of the machine after one line of writing is completed to the extreme left of the machine to begin the next line. To effect this movement, I have placed loosely on the rod D , and at the right of the yoke E , the collar S , which has a handle, S' , extending forward through a horizontal slot, A^2 , in the front of the case A , so that the handle may be grasped by the operator and slid to the left to carry the yoke, needles, and chain with it when the pawl P is disengaged from the ratchet-wheel. An arm fixed to the yoke E may be provided instead of the loose collar and handle S , if desired. A spring, Q' , connecting the lever Q to the case, keeps the lever in normal position, so that its head q may be moved either up or down, as above described.

For holding the paper above the puncturing-needles $F^1 F^2 F^3 F^4$, I provide a frame, T , which consists of end bars, t , a front handle-bar, T' , a bar or plate, U , and a roller, V . This frame T is hinged by a rod, t' , or suitable pins to lugs, $b^2 b^2$, on the end frames, B , so that the frame T may be swung back on its hinges to place the sheet W of paper across the top of the needle-plate N and above a bed-roller, V' , which is journaled in the end frames, so as to revolve with its periphery about on a level with the top of the needle-plate. When the frame T is swung over forward, its roller V will clamp the paper down upon the roller V' . (See Fig. 2.) The bar or plate U of the frame T is provided with parallel grooves u , which range above the back and front pairs of needles, $F^1 F^3 F^2 F^4$, respectively, and allow the needles to pass up clear through the paper, while preventing too great movement of the needles. On one end journal or gudgeon v of the roller V' , I fasten, by a key or otherwise, the ratchet-wheel X , having teeth x , engaged by a pawl, Y , which is pivoted at y to the inner end of a lever, Z , which is pivoted on the end frame, B , at z , and projects through an opening, A^3 , in the front of the case A . A spring, y' , holds the pawl Y to the ratchet-wheel, and the inner end of the lever Z may be weighted, as at z' , to carry the pawl down again after it is lifted to move the ratchet-wheel the distance of one tooth. The teeth x of the ratchet-wheel may have any desired length, according to the space to be left between the lines of writing. A stop, z^2 , on the end frame limits the downswing of the inner end of the lever Z when the end of the pawl Y has passed below the shoulder of the tooth x next to be acted on by the pawl.

To secure a better understanding of the operation and advantages of my invention, I give a brief description of the ordinary writing-slate for the blind, as follows: Said slate has a frame, on which the paper is laid, and a brass plate about one inch wide may be held in successively lower positions over the paper by pins entering the frame at each side. This brass plate has rows—three generally—of square cells or apertures formed through it, in the corners of which cells a stileto is guided to pierce the paper, the point of the stileto passing into grooves in a plate which is hinged to the frame, so as to fold flat upon the back of the paper. The different combinations of the four holes which may be made through the paper by the stileto in accordance with an understood code represent the characters of the writing which appear in embossed or raised edges at the other side of the paper from which the stileto works, the characters being read by the sense of touch. In this old style of slate the paper is pierced from the top and the characters appear at the back of the paper, and the writing must be done backward; or, in other words, to be read from left to right it must be written from right to left.

The operation of my improved machine is as follows: The square of needles being at the extreme left of the machine, the frame T is swung backward on its hinges at *t'*, as in Fig.

1. The sheet W of paper now is laid on the needle-plate N and over the bed-roller V', the paper—which may be of any size within the capacity of the machine—being also placed at the extreme left-hand end of the machine.
 10 The frame T now is swung forward to clamp the paper between the rollers V V', and the keys at the front of the machine are pressed down to operate the proper needles which pass upward in forming the character and into
 15 the grooves *u u* of the bar U. When the first character is formed, the head *q* of lever Q will be pressed downward, which causes the pawl P to move the ratchet-wheel O the space of one tooth, and carries the needles to the right,
 20 ready to again be forced upward through the paper for forming the next character; and these alternate shifting and puncturing actions of the needles will be continued entirely across the sheet of paper to complete the first line of
 25 characters, which having been done, the lever Q will be raised to disengage the pawl P from the ratchet-wheel O, and the lever or handle S' will be moved to the left to carry the chain H, yoke E, and the needle-arms and needles
 30 back again to the extreme left of the machine, ready to print a second line of characters below the first line when the paper shall have been moved backward the required distance, which is done by pressing down the lever Z,
 35 and moving the bed-roller V' around by means of the pawl Y and ratchet-wheel X, the paper being carried backward the required distance by the rollers V V'. The needles may now be operated by the keys as at first, and the
 40 writing may be produced in successive lines of perforated embossed characters, which appear on the upper face of the paper in the order in which they are to be read.

It is evident that with my improved machine the writing may be produced by one hand only, leaving the other free to read the raised perforated characters, which may be copied as read by the use of the machine, and the writing will be produced very much faster
 50 than by the use of the slate method, which requires the use of both hands, one to feel for the cells and to position the stiletto, which is worked by the other hand.

The square of needle-points in my improved machine corresponds precisely with the four corners of the cells of the common slate method; hence the writing is produced in accordance with the same code of characters. Should more than the four points be used for any
 60 given character, the square of needles will be moved twice to the right in forming the character, as will readily be understood.

Having thus described my invention, what I claim as new, and desire to secure by Letters
 65 Patent, is—

1. In a writing-machine, the combination,

with the vertically-movable puncturers or needles, of the stepped levers provided with arms having movement upon a support near their forward ends, and adjusted in a carriage connected to an endless traveling belt, together
 70 with means, substantially as described, for actuating the said levers and belt, substantially as and for the purpose set forth.

2. The combination, with the needles arranged, substantially as described, to have independent vertical movement, of mechanism, substantially as described, for operating the needles, a toothed wheel and chain, and connections, substantially as described, for moving the series of needles transversely, substantially as set forth.

3. The combination, with a series of needles connected to independent rocking arms fitted to slide transversely, of independent pivoted bars or plates engaging said arms, and means, substantially as described, for rocking them to cause the needles to puncture the paper, substantially as described.

4. The combination, with a series of needles arranged in the form of a square, of independent rocking arms fitted to slide transversely, and independent rocking bars or plates engaging said arms, and connected by rods or stems with a series of keys for raising the needles to puncture the paper from the under side, substantially as described.

5. The combination, with a series of needles arranged in the form of a square and connected to independent rocking arms fitted to slide transversely of said arms, of independent rocking bars or plates engaging said arms, means, substantially as described, for rocking them to raise the needles, and a plate apertured for the passage of the needle-points and fitted to slide with the needle-arms, substantially as described.

6. The combination, with a group of needles arranged in the form of a square and connected to independent rocking arms fitted to slide transversely of said arms, of independent pivoted bars or plates engaging said arms, means, substantially as described, for rocking them to raise the needles, a plate apertured for the passage of the needle-points and fitted to slide with the needle-arms and needles, and a bar or plate held above and in the path of the needles, and provided with grooves into which the needle-points pass in puncturing the paper, substantially as described.

7. The combination of the pivoted rocking bars B' B² B³ B⁴, the needle-arms C' C² C³ C⁴, carrying the group of needles F' F² F³ F⁴, and mounted to slide on a rod or bar and adapted to be lifted by the rocking bars, and a needle guide-plate, N, fitted to slide along a bar, M, substantially as shown and described.

8. The combination, with the needle-arms C' C² C³ C⁴, carrying the group of needles and fitted to slide on a bar, D, of the rocking bars B' B² B³ B⁴, engaging notches or shoulders of the needle-arms, a series of buttons or keys for

actuating the needles, and the rods or stems $G' G^2 G^3 G^4$, connecting the rocking bars with the keys, substantially as shown and described.

5 9. The combination, with the group of needles $F' F^2 F^3 F^4$, fitted to sliding and rocking arms $C' C^2 C^3 C^4$, as specified, of the guide-plate N , apertured for the passage of the needles and fitted to slide along the bar M ,
10 substantially as shown and described.

10 10. The combination, with the group of needles $F' F^2 F^3 F^4$, held in rocking arms $C' C^2 C^3 C^4$, which slide on a bar, D , and are actuated by the rocking bars $B' B^2 B^3 B^4$, respectively, and the apertured needle guide-plate N , fitted to slide on a bar, M , as specified, of
15 a bar, U , held above the needle-plate and having the grooves $u u$ in its under side above the points of the needles, substantially as
20 shown and described.

11. The combination, with the needle-arms $C' C^2 C^3 C^4$, carrying the group of needles and fitted to slide on the bar D , of the yoke E , connected to the endless chain H , and means, substantially as described, for moving the chain
25 to shift the needles to form successive characters in a line, substantially as shown and described.

12. The combination, with the needle-arms
30 $C' C^2 C^3 C^4$, carrying the group of needles and fitted to slide on the bar D , of the yoke E , endless chain H , wheels $I J$, ratchet-wheel O ,

pawl P , and the lever Q , substantially as shown and described.

13. The combination, with the needle-arms 35 $C' C^2 C^3 C^4$, held on a bar, D , within a yoke, E , fixed to the endless chain H , wheels $I J$, and the ratchet-wheel O , pawl P , and lever Q , of the arm R , having the shoulder r , and means, substantially as described, for sliding 40 the yoke and needle-arms back to the initial position, substantially as shown and described.

14. The combination, with the needle-arms $C' C^2 C^3 C^4$, held on a bar, D , within a yoke, E , fixed to the endless chain H , wheels $I J$, the 45 ratchet-wheel O , pawl P , lever Q , and arm R , of the lever or arm S , adapted to move the yoke and needle-arms, substantially as shown and described.

15. In a writing-machine, the combination, 50 with the vertically and transversely movable needles, of the bar disposed above the needles and having grooves in its under side in the path of the needle-points, substantially as shown and described, and for the purpose set 55 forth.

WILLIAM ^{his} ~~X~~ H. PERKINS.
mark.

Attest: E. G. BUCKNER.

Witnesses:

JOHN MOORMAN,
JNO. WEIR.