

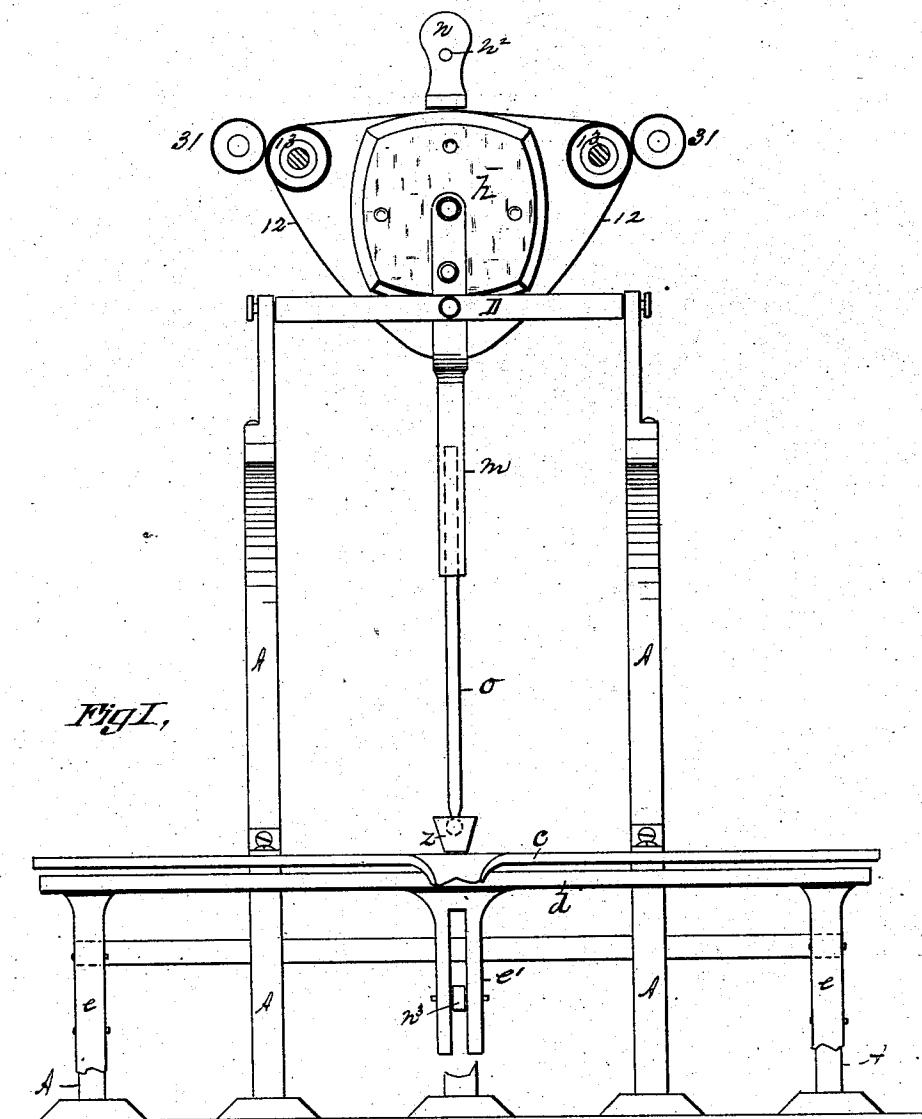
(No Model.)

4 Sheets—Sheet 1.

H. B. RICHARDSON.
TYPE WRITING MACHINE.

No. 292,854.

Patented Feb. 5, 1884.



Witnesses,
R. T. Hyde
M. C. Buck

Inventor,
H. B. Richardson,
by Harry A. Chapman
Atty.

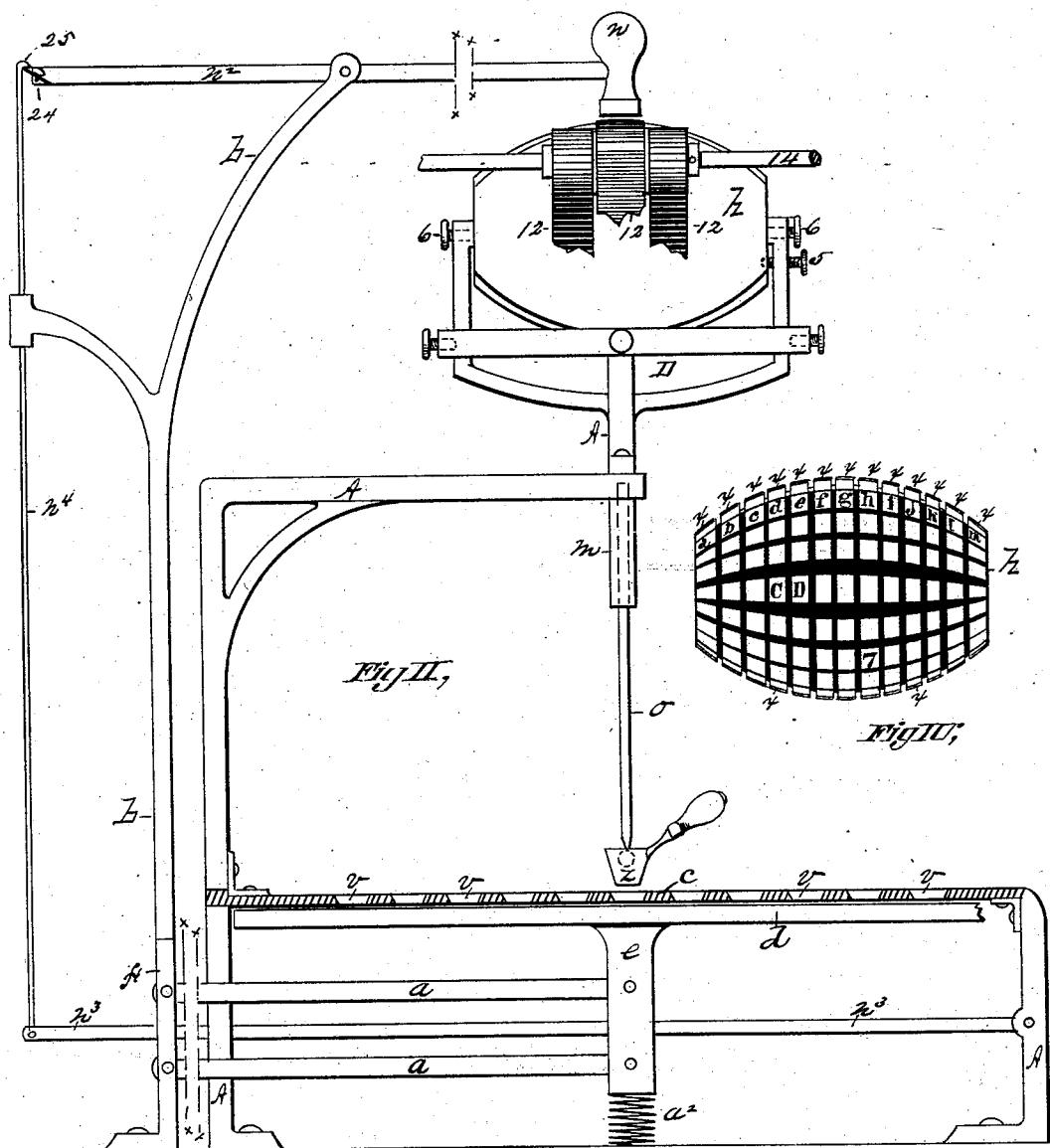
(No Model.)

H. B. RICHARDSON.
TYPE WRITING MACHINE.

4 Sheets—Sheet 2.

No. 292,854.

Patented Feb. 5, 1884.



Witnessed,
T. J. Hyde
M. C. Buck

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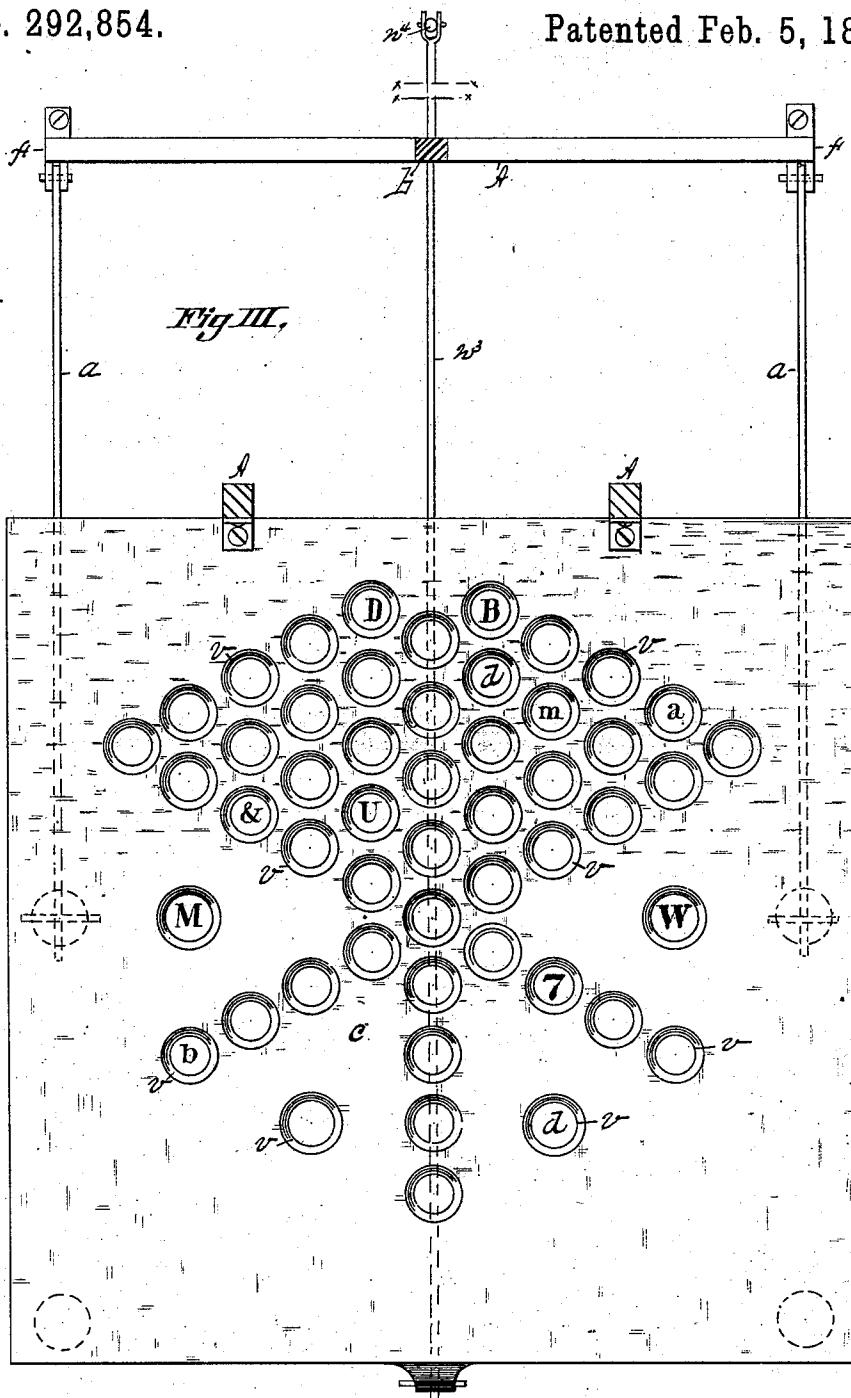
(No Model.)

4 Sheets—Sheet 3.

H. B. RICHARDSON,
TYPE WRITING MACHINE.

No. 292,854.

Patented Feb. 5, 1884.



Witnesses,
R. F. Styer
M. L. Buck

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att'y;

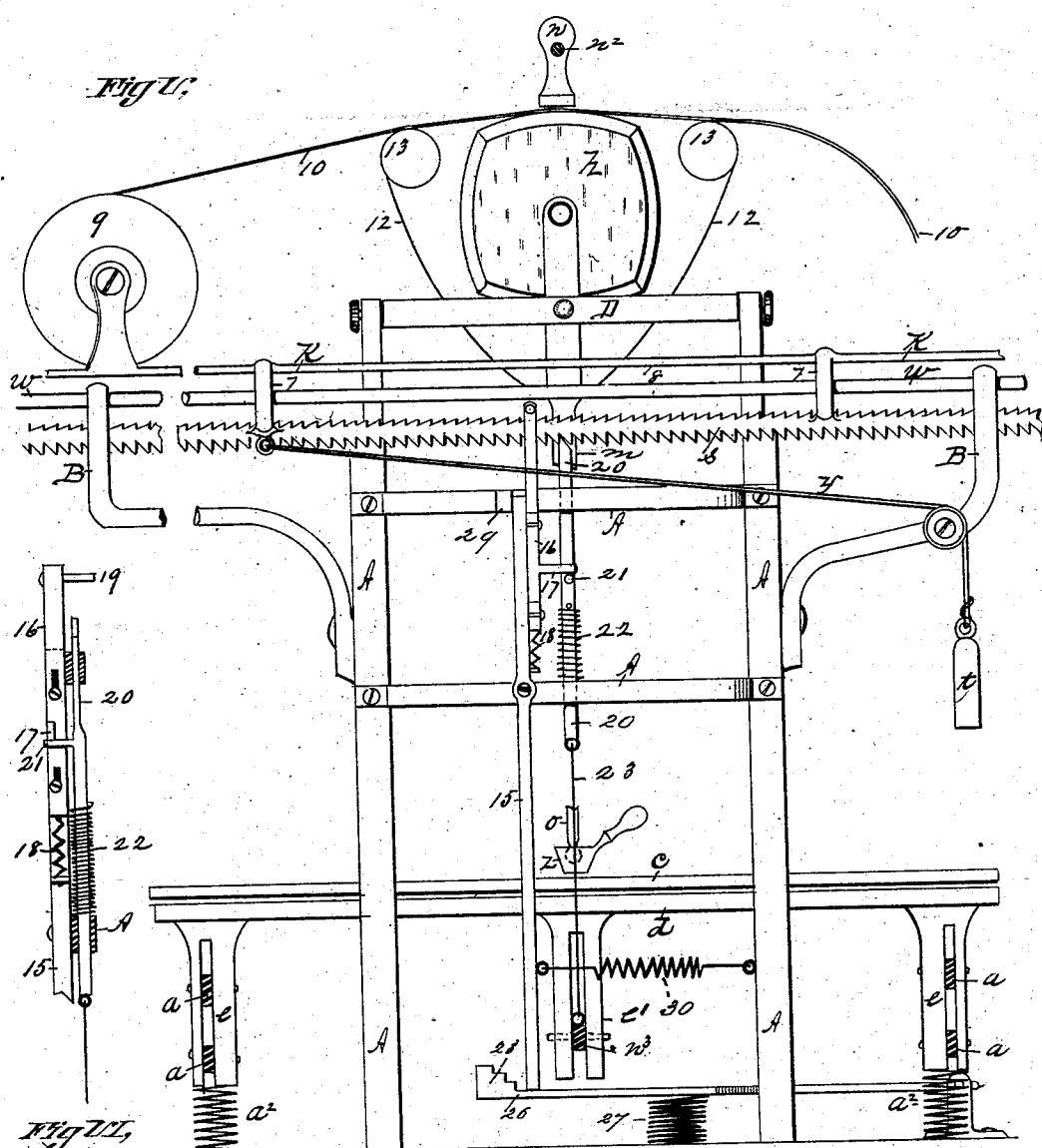
(No Model.)

H. B. RICHARDSON.
TYPE WRITING MACHINE.

No. 292,854.

4 Sheets—Sheet 4.

Patented Feb. 5, 1884.



UNITED STATES PATENT OFFICE.

HENRY B. RICHARDSON, OF AMHERST, MASSACHUSETTS.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 292,854, dated February 5, 1884.

Application filed July 17, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY B. RICHARDSON, a citizen of the United States, residing at Amherst, in the county of Hampshire and State 5 of Massachusetts, have invented new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to improvements in type-writers; and it consists in improved type-bearing devices and means for bringing any type-letter, at the will of the operator, to such a position that its impression shall be made upon the paper at the proper time and in its proper place; and, furthermore, in improved 15 means for providing in one machine several forms of type, either one of which may be employed continuously or alternately, and for causing the paper to be so moved over the type-letters that the space provided for each letter 20 shall be proportionate to the width of the latter; and in improved means to co-operate with said type-bearing and operating devices, whereby the proper impress of the paper upon the type is effected when the latter is brought into 25 proper position; the object being to greatly simplify the construction of machines of this class, to provide improved means whereby several varieties of type-writing may be produced upon a single line or in a single word, thereby 30 affording improved facilities for emphasizing words.

In the drawings forming part of this specification, Figure I is a front elevation, partly in section, without the paper-carriage. Fig. 35 II is a side elevation, also partly in section and without said paper-carriage. Fig. V is a rear elevation combining said paper-carriage and also partly in section—said three figures illustrating a type-writing machine embodying 40 my improvements. Fig. III is a plan view of the table of the machine and certain detail parts. Fig. IV is a side view of the type-block, and Fig. VI is a detail view of stop devices for the paper-carriage.

In the drawings, A indicates the general 45 frame of the machine. B are paper-carriage supports secured to frame A. K is a paper-carriage of ordinary construction, (except the double-serrated rack-bar s,) consisting of 50 said rack and the usual frame-work, supported

by posts 7 on suitable horizontal bars, w, adapted to carry the paper over the type-block, the whole being actuated to slide on said bars by the weight and cord t and y, and having its movements governed by devices hereinafter 55 described. The paper is carried on a roll, g, or other convenient device, or may be held between ordinary compression-rollers.

The printing-characters x—in this machine letters, figures, &c.—are arranged upon the 60 sides of a type-block, h, said sides thereof being curved convexly, as shown in Figs. I, II, and IV. Said block h, as herein shown, provides four sides, upon which printing-characters are arranged. It is obvious that they 65 may be arranged upon one or more sides thereof. Said block h is pivoted in the machine to be rotated on its central longitudinal line, whereby either of its said convexly-curved sides is brought uppermost and the letters or 70 characters thereon into proper position for printing. Said type-block is hung in a frame known as a “gimbal-frame” (herein designated by the letter D) by the pins or screws 6, which pass through uprights on said frame and enter each end of said type-block far enough to sustain it upon their points. A stop-pin, 5, passes through one of said uprights, and is adapted to enter any one of a series of holes in 75 one end of said block h, to retain the latter in 80 said frame in such a way that whichever face is uppermost it will so remain until the block is turned on its pivots by the operator. The said gimbal-frame D is pivotally hung between two uprights of the frame A, (see Figs. I and 85 II,) and has a stylus-rod tube, m, secured centrally thereto and pending therefrom. A stylus-rod, o, is fitted to said tube m, so as to have a free reciprocating movement therein, and to its lower end is attached, by an ordinary ball-and-socket joint, the stylus z, of conical form, and provided with a suitable handle for convenient manipulation. Properly supported on frame A, under said stylus z, is the stylus-plate e, having therein a series of perforations, v, of differing diameters or openings. Directly under the aforesaid stylus-plate e is located the letter-plate d, which is provided with the lever-posts e e', pending from its under face. Said posts are slotted, 90 95 100

as shown, and to each of those lettered *e* (located near the outer edges of said letter-plate) are pivoted the ends of two parallel bars, *a*, and the opposite ends of said bars are pivoted 5 in two posts, *f*, at the rear side of the machine. Springs *a*² are placed under the ends of said posts *e*, whereby said plate *d* is carried upward against or toward plate *c*. The aforesaid arrangement of the parallel bars *a* provides supports for sustaining the letter-plate 10 *d* under plate *c*, with its surface in substantially the same plane with the latter, and allows said letter-plate to be deflected from said stylus-plate, springs *a*² throwing the letter-plate up, as aforesaid. A lever, *n*³, having one end pivoted to frame *A*, at the front side 15 of the machine under said plates *c* and *d*, extends from thence through said slot in post *e* on plate *d*, in which post it is so pinned as not to interfere with the free vertical movements 20 of plate *d*, and terminates at the rear of the machine. A hammer-post, *b*, stands at the rear side of the machine, to the upper end of which is pivoted the bar *n*², which carries on 25 one end the hammer *n*, the latter being held centrally over the curved upper face of the letter-block *h*. The rear end of said bar *n*² is hinged to the main part of the bar at 24, thus permitting its extreme end to be turned upward, but to come to a fixed horizontal position when swung down, as in Fig. II. A rod, *n*⁴, is pivotally attached to the end of said lever *n*³, and is supported in a vertical position by passing through an arm on the hammer-post *b*. The upper end of said rod *n*⁴ is provided with a hook, 25, to engage with the end of said bar *n*². Thus it will be seen that if the letter-plate *d* be depressed rod *n*⁴ is drawn downward, causing hammer *n* to be lifted, 30 hook 25 finally slipping off from the end of bar *n*² and letting said hammer fall against the letter-block *h*. When springs *a*² throw plate *d* upward again, hook 25 strikes said hinged end of bar *n*², turning it up, and in its return 35 movement engaging with it, as before.

The above-described letter-plate *d* bears upon its surface at exposed points thereon, which can be seen through the openings *v* in the stylus-plate *c*, letters corresponding to 40 those on the faces of the letter-block *h*, and said openings *v* are made of greater diameter when they are to show such broad-faced letters as W M, &c., than when exposing letters *a*, *b*, &c. The stylus *z*, as hereinafter described, is pressed upon plate *d*, in operating 45 the machine to write, and since said openings *v*, of larger diameter, permit the stylus to penetrate farther through them, it is obvious that in the latter case the plate *d* is depressed to 50 a greater degree than when said stylus is operated through the smaller openings in the stylus-plate, and said greater depressions of said letter-plate are caused to effect such an amount of transverse movement of the paper-carriage *K* as will insure the requisite room in 55 the line for a wide-faced letter, in the follow-

ing manner: A lever, 26, is hung in a horizontal position under the post *e*', Fig. V, having under it a spring, 27, to hold it up to the position shown. Said lever 26 is provided with a 60 series of offsets, 28, (for which an incline may be substituted.) A rack-dog, 20, whose upper end is adapted to engage with the teeth on the under edge of rack *s*, is hung in frame *A*, and is capable of a downward movement 65 through its connection with lever *n*³ by rod 23, and a return movement against said rack by spring 22. Said dog has on it a horizontal arm, 21. A vibratory lever, 15, is pivoted to frame *A*. The upper end of said lever swings 70 against a stop, 29, on said frame actuated by a spring, 30, attached to it near its lower end, and the latter reaches nearly down to said lever 26. On the side of said lever 15 at its upper end is arranged a sliding bar, 16, having 75 an arm, 17, thereon, and pin 19 therethrough, the latter being adapted to engage with the teeth on the upper edge of rack *s*, and the former with said arm 21 on the dog 20. A spring, 18, draws bar 16 downward and keeps 80 arm or pin 19 in engagement with the upper edge of said rack when said bar is undisturbed. As above described, weight *t* tends to draw carriage *K* with rack *s* to the right, Fig. V. The dog 20 holds said rack from moving until the 85 letter-plate *d* is depressed by the stylus *z*. The downward movement of said plate, when the stylus is operated over letters of ordinary width, does not bring the end of post *e*' against lever 26 with force enough to move the latter 90 bar. Said movement swings down lever *n*³, and draws dog 20 away from rack *s*, and lets bar 16 slide on lever 15 to bring pin 19 into engagement with said rack, and the latter and carriage *K*, with the paper 10, now slide along 95 to the right until the lower end of lever 15 strikes the vertical side of the first offset on lever 26, when the motion of the said carriage is arrested. The upward movement of plate *d* allows dog 20 to engage again with rack *s*, 100 and lifts pin 19 above the latter. When the stylus *z* is operated over wide-faced letters, plate *d* is so much farther depressed as to cause post *e*' to strike lever 26, carrying it down 105 so far as to permit the lower end of lever 15 to swing to the left against the vertical face of the second or third offset on lever 26, and permit a corresponding increased movement of carriage *K*, as required, by the width of the face of the letter over which said stylus was 110 operated.

The inking devices in this machine consist of the ordinary ink-ribbons, and they are mounted on rollers 13 on each side of the letter-block *h*, said rollers being supported on 115 shafts 14, which latter may be supported in any convenient manner from the frame *A* of the machine. Said ribbons consist of three or less, whereby one or more colors of ink are provided for use with the machine, and 120 consist of endless bands passing over said rollers and across the upper face of the type-

block and back under the latter. Feed-rolls 31 may be adapted to move said ribbons by hand or automatically over said type-block. The rollers 13 are adjustable on said shafts 14, 5 to bring either of said ribbons 12 centrally over said type or letter-block *h*.

The operation of this machine is as follows: The gimbal-frame *D*, in which the letter-block *h* is supported, provides for a free movement 10 of the latter when the stylus *z* is seized by the operator and swung to different positions over the stylus-plate *c*. The ball-and-socket-joint connection of the stylus with the lower end of rod *o* permits the operator to press said stylus vertically through the openings *v* in said stylus-plate, and against the letter-plate, when said rod *o* stands at an angle or incline over said plates; and since the rod *o* is capable of a free movement within tube *m* of the gimbal-frame, 15 provision is made whereby said stylus may be carried from opening to opening over the letter-plate, centrally located or otherwise, and be pressed against plate *d*, as above set forth. The arrangement of the letters on block *h* is 20 such that when the stylus *z* is carried over a certain letter on the plate *d*, a corresponding letter on said letter-block is brought directly under the hammer *n*, and the same letters on different faces of the letter-block occupy a 25 corresponding position on all, so that when writing, if it be desirable to interpose Italics in a line with other letters, it can be done by turning said block to bring its Italic-lettered face under the hammer, and so on, in respect 30 to any other changes within the limits of the variety of letters borne upon the several faces of said letter-block. Thus the paper 10 is placed under the hammer *n*, and allowed to lie upon the inking-ribbon thereunder, carriage 35 *K* being moved to the left, so that the line of writing will be commenced at the border of the paper, as usual. The stylus *z*, being grasped by the operator, is pressed upon letter after letter upon plate *d*, the lateral movement of said stylus being followed by the letter-block, as above described, to bring each letter under the hammer. As plate *d* is deflected by the stylus, hammer *n* is lifted and dropped upon the paper, driving it with such 40 a quick, sharp blow against the inking-ribbon 12 and the letter thereunder, so as to produce the impression of said letter clearly upon the paper.

The above-described movement of plate *d*, 45 whereby the hammer was operated, was sufficiently preceded by the movement of carriage *K* (operated as before described) to bring the paper to a proper position over the letter on block *h*.

60 Where it becomes desirable to operate one of these machines on a greater variety of type-forms than can be embodied in one letter-

block, several of the latter may be provided for use with a machine, all being adapted to operate with the other parts thereof. 65

What I claim as my invention is—

1. In a type-writing machine, a gimbal-frame pivotally supported therein, a letter-block hung in said frame and bearing a series of printing-characters upon one or more surfaces thereof, and adapted to be rotated on its bearings, a hammer to strike upon said block, and operating mechanism, a movable letter-plate bearing a series of letters and characters upon its surface, the stylus *z*, and appliances, 70 substantially as described, connecting said gimbal-frame and stylus, whereby the latter is permitted to be moved to different positions over the surface of said letter-plate and to be pressed thereupon and moved downward with 75 the latter, combined and operating substantially as set forth.

2. The stylus *z*, of conical form, a movable letter-plate, and a stylus-plate located over said letter-plate and provided with dissimilar 80 perforations, combined and operating substantially as set forth.

3. In combination, the movable letter-plate *d*, the perforated stylus-plate *c*, the gimbal-frame *D*, having the tube *m* thereon, the rod 90 *o*, and the stylus *z*, substantially as set forth.

4. The pivoted bar *n*², bearing hammer *n* on one end thereof, the movable letter-plate *d*, lever *n*³, rod *n*⁴, and the stylus *z*, capable, by means substantially as described, of lateral and 95 vertical movements, and adapted to be pressed upon various parts of said letter-plate, combined and operating substantially as set forth.

5. In combination, the letter-plate *d*, having the slotted posts *e* thereon, the parallel 100 bars *a*, and the springs *a*², substantially as set forth.

6. The combination, in a type-writing machine, of a paper-carriage provided with the rack *s*, having two serrated edges, of the stylus 105 *z*, the stylus-plate *c*, provided with dissimilar perforations, the movable letter-plate *d*, and mechanism, substantially as described, interposed between said letter-plate and rack *s*, whereby the latter is allowed to move along 110 to a degree proportionate to the deflective movement of said letter-plate, substantially as set forth.

7. The combination, with the movable table *d* and lever *n*²; and with the rack *s*, of the lever 26, the lever 15, the sliding bar 16, provided with pin 19, the dog 20, adapted to engage with said bar, and springs 18, 22, and 30, substantially as set forth. 115

HENRY B. RICHARDSON.

Witnesses:

R. F. HYDE,
M. C. BUCK.