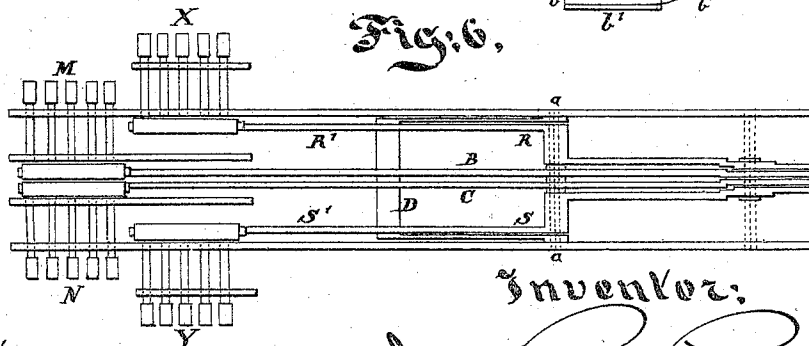
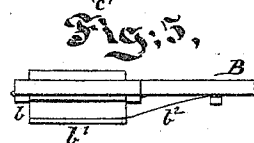
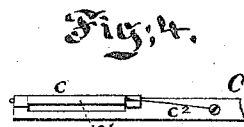
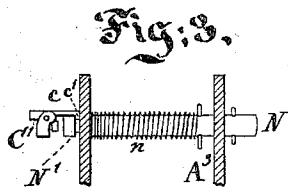
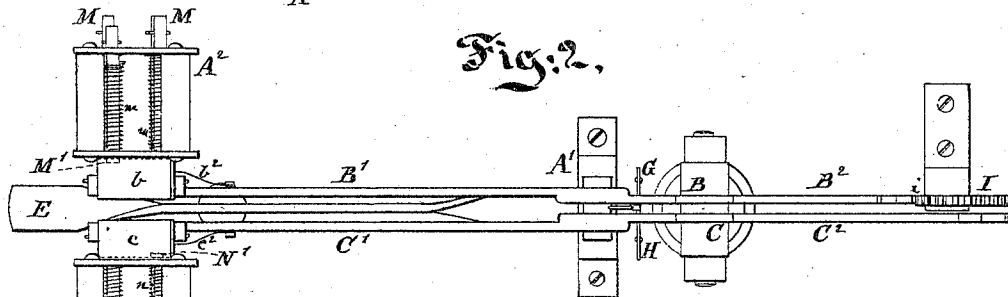
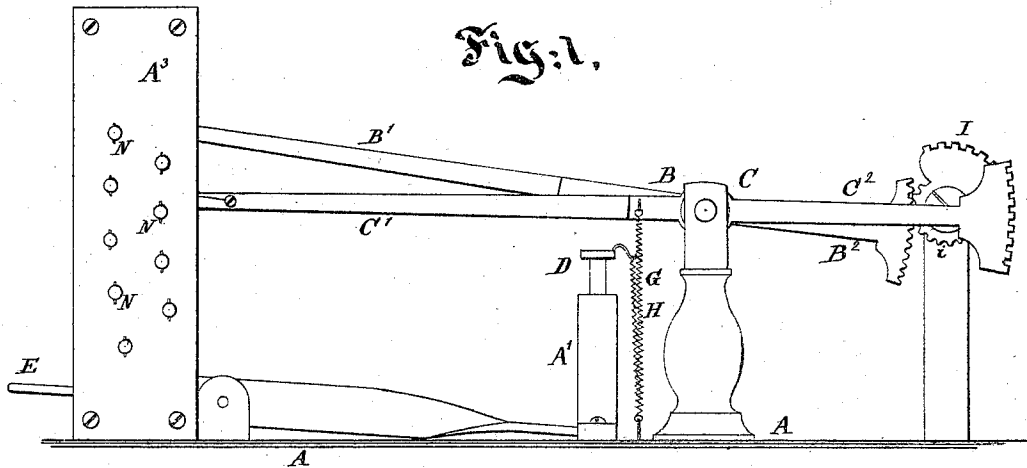


J. R. PEMBER.
Type Writing Machines.

No. 139,914.

Patented June 17, 1873.



Witnesses:

Arnold Horwath.

Wm. C. Dey

Inventor:

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by his attorney
J. S. Stebbins

UNITED STATES PATENT OFFICE.

JAY READ PEMBER, OF RANDOLPH, VERMONT.

IMPROVEMENT IN TYPE-WRITING MACHINES.

Specification forming part of Letters Patent No. **139,914**, dated June 17, 1873; application filed January 31, 1873.

To all whom it may concern:

Be it known that I, JAY READ PEMBER, of Randolph, Orange county, Vermont, have invented certain Improvements relating to Type-Writing Machines, of which the following is a specification:

Many machines have been constructed, and more proposed, having for their object to print one letter at a time, according as keys are fingered by the operator. My machine is analogous; but, instead of printing only one letter at a time, it prints several, preferably four, and the paper is, of course, moved along to a correspondingly greater extent at each movement.

I believe it is practicable for a skillful operator, with practice, to operate four sets of keys, two with the thumbs and two with the fingers, with a rapidity nearly equal to that with which single sets of keys may be operated. The time required by the machine to allow the feeding forward of the paper and the movements of the printing devices and the paper toward each other and back again may obviously be as little for operating a number as a single type.

The details may be carried out with various modifications. I will proceed to describe what I consider the best construction of the apparatus in a simple form, adapted for printing only two letters at a time.

The accompanying drawings form a part of this specification.

Figure 1 is a side elevation. Fig. 2 is a plan view. Figs. 3, 4, and 5 show details, detached. Fig. 3 shows one of the keys with a section through the key boards or supports, and a partial view of one of the levers. Fig. 4 is a side elevation of that part of a lever with its hinged flap and spring. Fig. 5 is a view of the same from below. The additional figure shows the arrangement for printing four letters at a time.

Similar letters of reference indicate corresponding parts in all the figures.

The drawings represent the novel parts, with so much of the ordinary parts as is necessary to indicate their relations thereto.

Referring to Figs. 1 to 5, A is the fixed framing of the machine, certain parts thereof being indicated when necessary by A¹, A², &c.

B C are levers turning on a fixed axis, *a*. The long arms B¹ C¹ of these levers outweigh the short arms B² C², and are moreover drawn down by springs G H. D is a lifter sliding in a guide, A¹, and operated by a treadle, E, to turn both the levers B C by raising the long arms B¹ C¹. The range of motion of each arm B and C is sufficient to present, either directly or through the intervention of gearing, the entire series of letters in the alphabet, with such marks, stops, numbers, &c., as are required. I allow the treadle to raise the long arms B¹ C¹ with each motion to their highest limit, and I arrest the arms at different points in their descent as required to present the right letters to the paper. M M, &c., and N N, &c., are pins sliding in the upright frames or key-boards A² A³, and forced outward by springs *m n*. They serve as keys, the one set M being operated by the left hand and the other set N being operated by the right hand of the operator. The long arms B¹ C¹ of the levers B C are each provided with a hinged flap controlled by a spring, and traversing close to the ends of the corresponding pins. When a pin, M, is pressed inward by the finger so that its inner end projects into the path of the flap *b*, the latter may yield by the action of its spring *b*² and allow the lever to rise; but on the descent of the lever the flap is arrested by the projecting end of the pin M, and, according to the position at which it is thus arrested, a letter or type will be presented by the other end of the lever to act on the paper. The end of each pin M N is formed with a collar, M¹ N¹, as shown, and the under sides of the corresponding flaps *b c* are each formed with a corresponding lip or flange, *b*¹ *c*¹. When a pin M N is pressed inward by the finger and held there until the corresponding lever has descended so as to press its flap *b* or *c* upon it, the lip on the under side of the flap engages with the collar on the end of the pin and holds the parts locked or hooked together so that the pin cannot retreat if the finger is withdrawn too soon. The fingers may, therefore, after having pressed inward a pin until it is thus engaged, be occupied in finding the proper pin for the next operation while the printing is being effected on the paper and the

levers are being raised again by the treadle preparatory to the next operation.

I take care to dispose the pins M and N in such a manner that the pressing in of either pin shall hold the respective lever at a different height from any other which it will be held by the pressing in of any other pin in the series. Each side of the machine is a complete series in itself, and acts entirely independent of the opposite side, except that both levers are operated by the same treadle, and the paper is presented.

I propose to ink the types with any suitable ink, preferably a thin printing-ink, such as is used in the printing-telegraph, and to apply the same by one or more rollers or pads. I propose to draw the paper against the types at each operation, having the paper mounted on a flat or other surface, preferably for some uses on a cylinder with an endwise as well as a rotary motion.

The short arm C² of the lever C is represented as carrying the types directly on its curved extremity. The short arm of the lever B, on the contrary, is represented as gearing into a segment of a wheel, by means of which the motion is multiplied and the types are presented on a rounder surface than would be otherwise practicable. I can use either of these arrangements for both levers, but prefer the gearing shown connected with the lever B. Although I have shown in these figures only two levers carrying types to be printed simultaneously side by side on the paper, I can employ a larger number.

Fig. 6 is an outline diagram, showing the arrangement which I propose for thus presenting four types at once. In this the central levers B and C correspond in their arrangement and functions to those before described, while R and S are additional levers mounted loosely on the same shaft *a*, and subject to be lifted by the same lifter D; but these levers R and S are widened at their fulcrums or points of turning on the shaft *a*, so that the long arms R¹ S¹ are considerably wider apart than the corresponding arms of the other levers, and are thus brought within the range of two other sets of pins, X and Y. It being understood that these levers are provided with hinged flaps, and that the pins are similarly provided with springs for forcing them back, and collars for holding them engaged with the flaps, it only requires sufficient skill on the part of the operator to play the pins X Y with the fingers while the pins M N are played with the thumbs.

I can employ carbon paper or ribbon as a means of producing the impression instead of ink. The lifter D, instead of sliding through the frame-work A, may be a lever turning loosely on the same shaft *a* as the other levers and properly connected to the treadle.

It may be found preferable by most operators to make the thrust or tread with the foot simultaneously with the action of the fingers and thumbs. To better effect this, and for other reasons, it may be preferable to reverse

the action of the treadle, provide a sufficiently strong spring under the lifter D to hold it with its load always in the highest position, and allow the force of the treadle to be exercised in depressing the lifter.

With either or any arrangement the levers B C may move a little further than is required to pass its entire series of pins or keys, and the first or last part of its motion may be made available by suitable connections to press up the paper and receive the impression.

I conceive it possible to operate, with proper connections, five sets of pins or keys with each hand, employing, of course, a corresponding number of levers or other suitable connections.

Some of the advantages due to certain features of the invention may be separately enumerated as follows:

First, by reason of the fact that at each impression of the paper two or more types are presented and the paper is fed forward to a correspondingly increased extent, I am able to operate with a nearly correspondingly increased rapidity without involving any more rapid motion of any of the parts.

Second, by reason of the arrangement of the two key-boards A² A³ with the keys M N, as shown, so as to be operated toward each other, the hands are easily applied, and the keys are able to act on their respective levers with direct and simple mechanism.

Third, by reason of the four sets of keys M N X Y, and four levers, B C R S, arranged as shown, I am able to operate two sets conveniently with each hand, and to cause each to adjust its types independently by very simple movements.

Fourth, by reason of the mounting of the types or letter-producing devices on the segment I, geared, as shown, by the teeth *i* B², to the respective operating-lever, I am able to give a large range of movement to the printing-surface with a moderate motion of the operating-lever, and, by the curvature of the surface, to diminish the risk of producing any impression by the letter above or below the one used.

Fifth, by reason of the hinged flaps and springs on the several levers, I avoid stoppage of the action or strain, or fracture of any part, if a pin is pushed in before the corresponding lever is properly raised.

Sixth, by reason of the locking-collars on the several pins, and the corresponding engaging-lips on the levers B C, or on parts carried thereon, I am able to retain the pins in their inward position, and consequently to hold the levers ready for an impression as long as may be desired after they are once placed.

I claim as my invention in type-writing machines—

1. The combination of two or more sets of type-presenting means, B C, with controlling keys M N, and connecting mechanism, so that the two or more types shall be presented simultaneously in proper order to the paper at the

will of the operator, substantially as herein specified.

2. The key-boards A^2 A^3 , pins M N, and levers B C, with means D, for moving the same in one direction at will, combined and arranged for joint operation, as and for the purposes herein set forth.

3. In combination with the type-presenting means B C, operating-keys M N, and the connecting mechanism, the duplicate sets of keys X Y, and corresponding type-presenting means R S, and their connecting mechanism, arranged as shown and adapted to be operated simultaneously therewith, as herein specified.

4. In combination with the lever B, its segment end, and series of keys M for arresting its motion at different points in its sweep, the type-segment I $\dot{i}$ operated by the lever as and for the purposes herein specified.

5. In combination with the series of movable keys M, and lever B sweeping across the motion thereof, and suitable printing devices carried by the said lever, the hinged flap b , with its spring b^1 serving therewith, as herein specified.

6. In a type-printing machine having a lever, B, arrested in different positions by keys or pins M, the collar m on the said arresting means adapted to engage with and to hold the lever, substantially as and for the purposes herein specified.

In testimony whereof I have hereunto set my hand this 3d day of January, 1873, in the presence of two subscribing witnesses.

JAY READ PEMBER.

Witnesses:

W. C. DEY,

ARNOLD HÖRMANN.