(No Model.) 4 Sheets—Sheet 1.

G. G. ALLEN.

TYPE SETTING AND PRINTING MACHINE.

No. 427,947. Patented May 13, 1890.

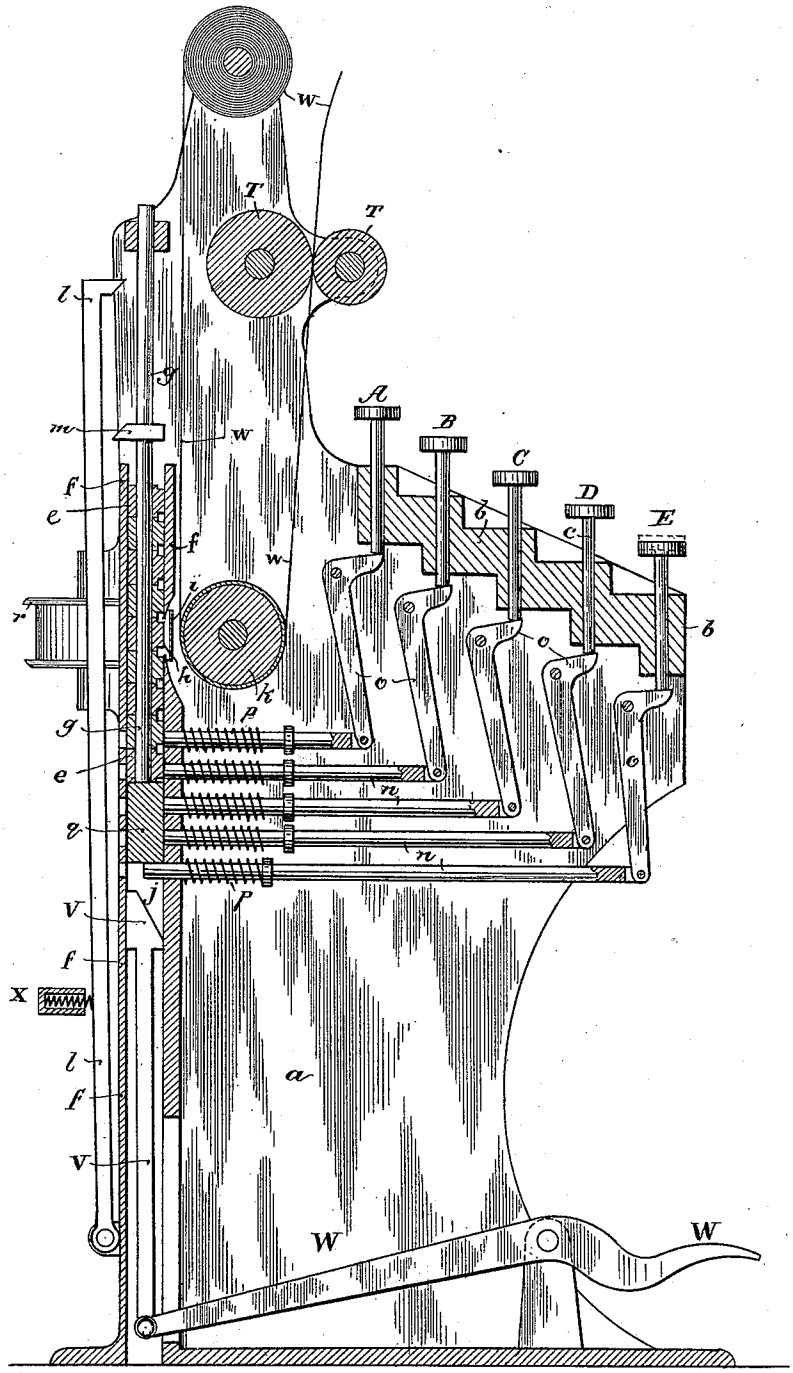

Fig. 1.

WITNESSES.
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(No Model.) 4 Sheets—Sheet 2.

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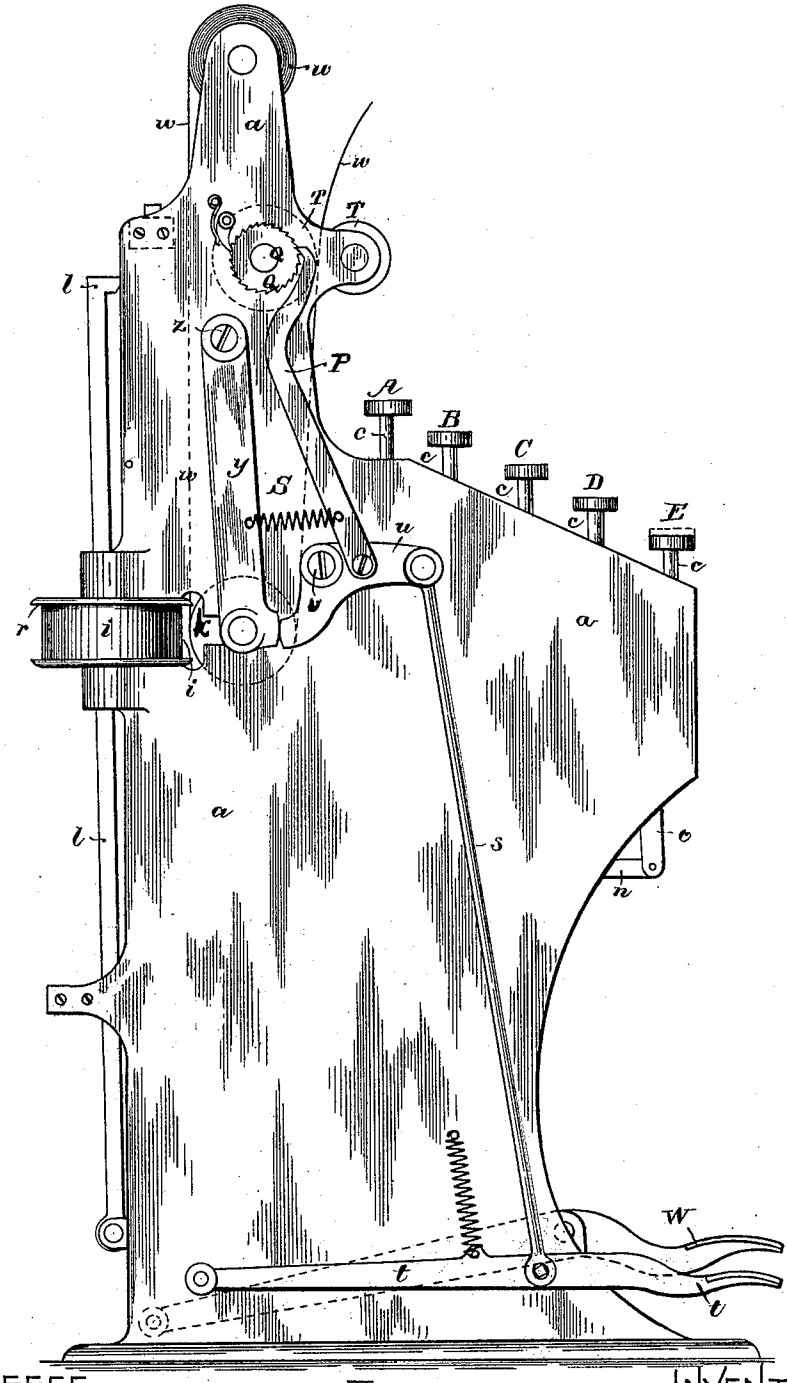

Fig. 2.

WITNESSES:
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(No Model.) 4 Sheets—Sheet 3.

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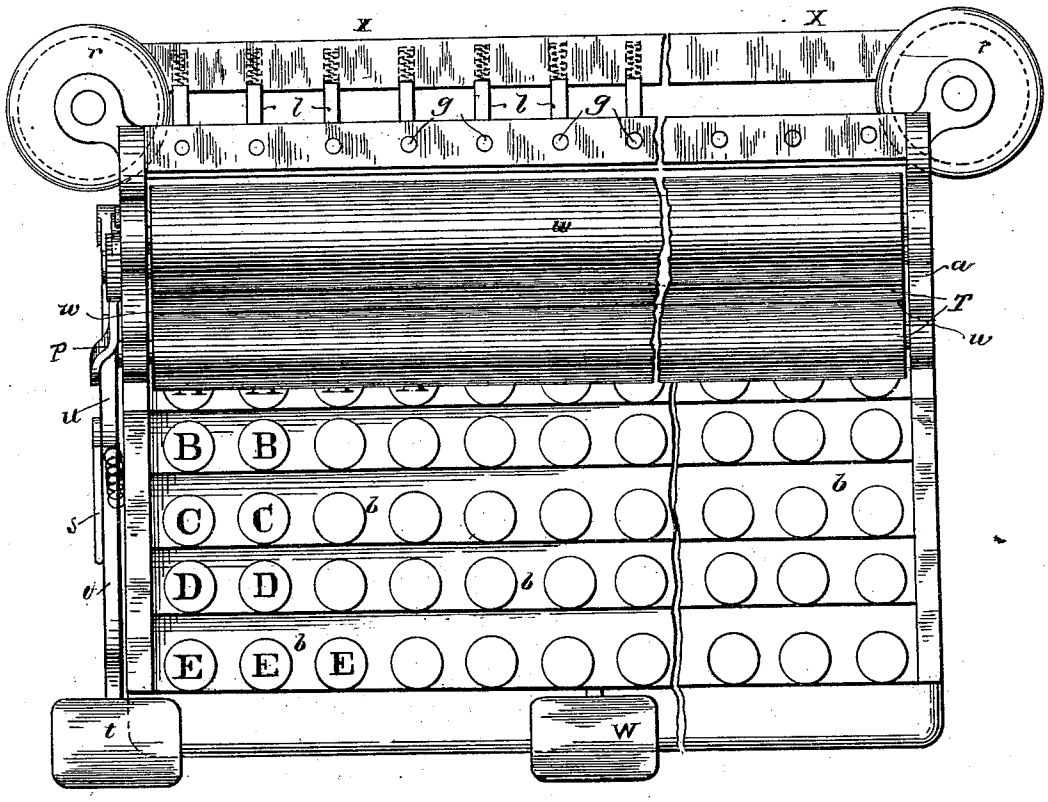

Fig. 3.

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(No Model.) 4 Sheets—Sheet 4.

G. G. ALLEN.

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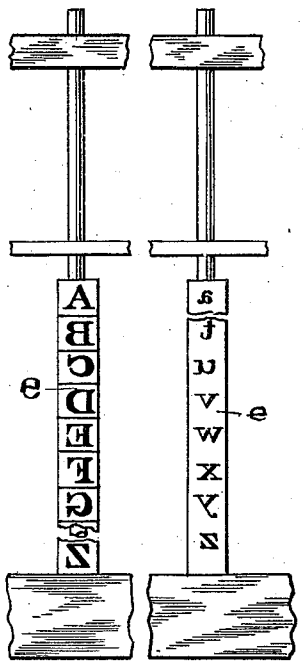

Fig. 4.

WITNESSES.

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Geo. H. Eastes

INVENTOR.

George G. Allen

by A. F. Spencer, atty

UNITED STATES PATENT OFFICE.

GEORGE G. ALLEN, OF MALDEN, MASSACHUSETTS.

TYPE-SETTING AND PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 427,947, dated May 13, 1890.

Application filed March 24, 1887. Serial No. 232,235. (No model.)

To all whom it may concern:

Be it known that I, GEORGE G. ALLEN, of Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Type-Setting and Printing Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

The object of this invention is to provide a type writing or printing machine in which each line of the matter to be printed is set up by means of keys and movable types, then printed at a single operation, and the types then distributed by another movement preparatory to printing the next line.

My improvements relate to the means of operating the types both in setting up the matter and in distributing the types, and to the various combinations of devices set forth in the appended claims, as well as to the method of operation followed in using my mechanism.

In the drawings, Figure 1 is a vertical section of a part of my improved machine, illustrating the arrangement of the keys, levers, types, and guides, hereinafter more fully described in connection with the setting of the line of type. Fig. 2 is an end elevation showing the printing-lever and feeding mechanism. Fig. 3 is a plan of a portion of the key-board, illustrating the successive recurrence of the same letter thereon. Fig. 4 represents a portion of two of the type-bars.

On touching any key in the line of letters desired to be printed the type corresponding thereto drops into position opposite to an aperture through which the printing-surface of the type comes in contact with the ribbon or the surface to be printed upon. The matter to be printed is set up along the line of the aperture by touching the key appropriate to each letter, several of which keys may be struck simultaneously, so that the letters are arranged in the order necessary to form the sentence. Spaces between the words are secured without any act of the operator other than omitting to touch any key corresponding to such space.

The frame *a* supports the various parts of the apparatus and will be of such form as may be most convenient. The key-board plate *b* is preferably stepped, as in Fig. 1, and it extends from side to side of the frame. Through this plate a series of vertical perforations is formed in each step to receive the stem *c* of a succession of keys, each key on any given step bearing the same letter in succession.

In Fig. 1 the five keys shown on five successive steps are lettered, respectively, A, B, C, D, and E, and in Fig. 3 the same keys are represented with their designating-letters each repeated along the line.

The types *e* are located in the vertical space *j* in the rear wall of the machine and move in vertical spaces or on vertical guide-rods *g* to bring the desired letter opposite to the opening *h* in said wall, through which it reaches the ink-ribbon *i*, coiled on rollers *r*, and makes its desired impression on the sheet of paper *w* in a continuous web, or carried by tapes and pressed with a sudden blow against the ribbon by the swinging roller *k*.

The several letters of the alphabet occur upon the type-faces in each of the vertical spaces, and may be all formed on a single type-block or on separate types, as in Fig. 1, since they move together in any case until the letter desired is opposite the opening *h*, as stated. Each vertical column of type is upheld by a pivoted rod *l*, having at its top a finger engaging with a catch *m* on the guide-rod *g* or directly with the type-block, if solid.

In order to drop the column of types to bring the proper letter opposite the opening *h*, the supporting-rods *l* are tripped by means of horizontal bars *n*, connected by pivoted knees *o* with the vertical stems *c* of the several keys. Pressure on any given key throws forward the corresponding bar *n*, which extends through holes in the rear of the wall *f*, and throws back the rod *l*, at the same time compressing a spring *p*, which surrounds the bar *n*. The reaction of this spring, acting on the collar of the bar, returns it nearly to its place, (see Fig. 1,) but leaves its extremity extending partly across the vertical space *j*, in which the type move, so as to stop their descent.

In Fig. 1 key E is shown as depressed, its bar *n* thrown forward, and the fifth in the series of types brought opposite the opening *h* and the ink-ribbon *i*, the block *q* being a blank fixed to rod *g* and on which the types rest. The proper letter in each column or

vertical space is brought into position in like manner, omitting to touch any key for the spaces between the words.

When the number of words desired in a line is thus set up, the line is printed at one operation by pressing down the treadle *t*, Fig. 2, which, by connecting-rod *s*, vibrates the lever *u* on its pivot *v* and throws forward the roller *k*, which brings the web *w* of paper with a quick blow against the ribbon *i* and the line of type behind it, said roller swinging on link *y* from pivot *z*.

The described movement of lever *u* depresses the pawl P, causing it, by means of its spring S, to engage with the next tooth of ratchet-wheel Q on one of the feed-rollers T, whereby the paper is fed forward, being uncoiled from the roll at the top of the machine. The printed end emerging from between the rollers T T may be cut off as desired, received on any temporary support, or dropped down in a continuous strip on the back of the machine.

After printing a line the types are distributed or raised to their original location in the vertical spaces, in which they move by means of a plunger V, worked by a treadle W, to throw upwardly the column of type until its catch *m* engages with the finger at the top of the supporting-rod *l*, these parts being beveled, as in Fig. 1, so as to readily pass each other on this upward movement, but not to allow the types to drop down again until pressure on a key throws forward a bar *n* and trips the support, as before described.

Suitable springs located on a cross-bar X may be provided to hold the supports *l* in place, but permit a slight yielding rearwardly.

The face of the plunger V is beveled, so as to throw back the bars *n* when the types are raised and to clear the vertical space for printing the next line. After the plunger has performed this work it drops out of the way by its own gravity.

I claim as my invention—

1. The types *e*, having a printing-face for each letter in a single vertical column, and a supporting-rod *l* for each column, in combination with suitable keys and tripping-bars to drop said types the desired distance, substantially as set forth.

2. The vertically-moving keys, pivoted knee-levers, and reciprocating tripping-bars, in combination with the types *e* and their supports operated thereby, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 22d day of January, A. D. 1887.

GEORGE G. ALLEN.

Witnesses:

A. H. SPENCER,

B. MARVIN FERNALD.