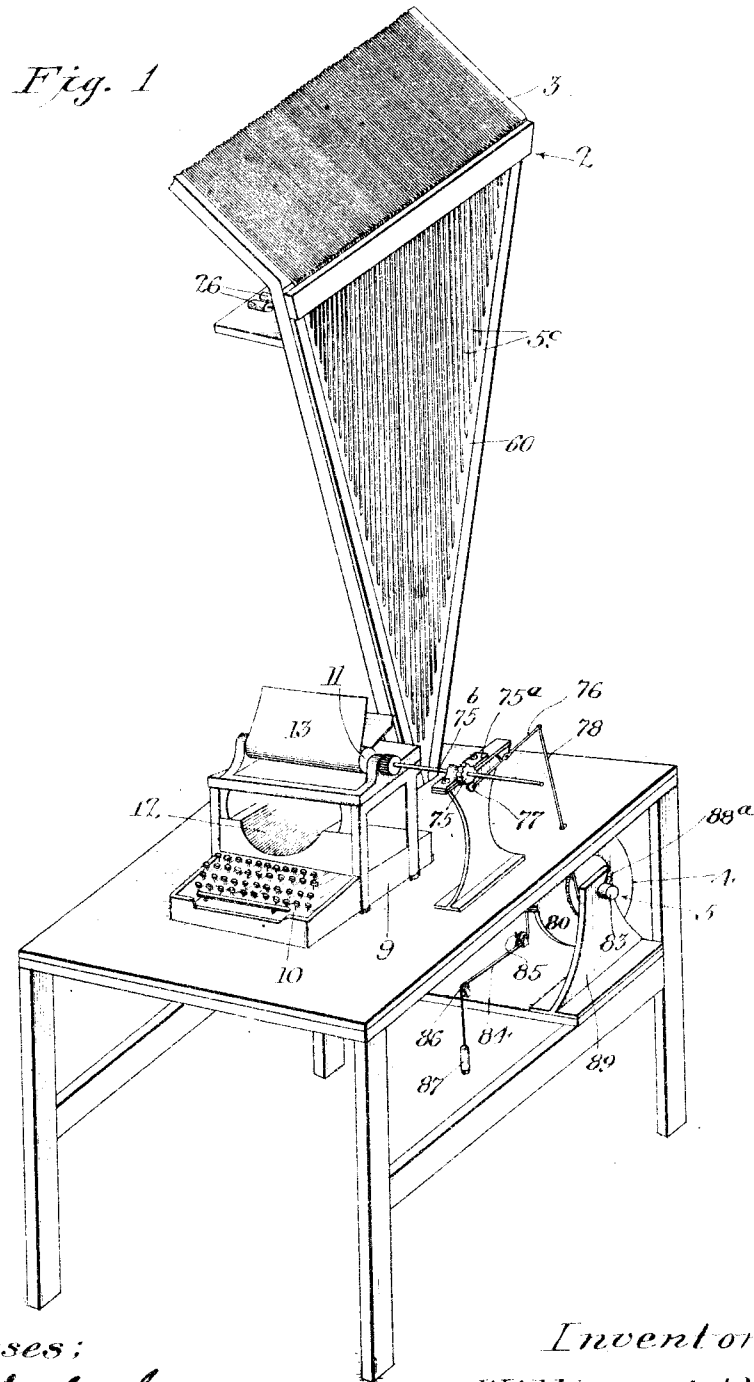


W. J. POOLE.
TYPE COMPOSING MACHINE.
APPLICATION FILED MAR. 28, 1911.

1,032,564.

Patented July 16, 1912.

5 SHEETS-SHEET 1.



Witnesses:
J. D. Thornburgh
Lester A. Allen

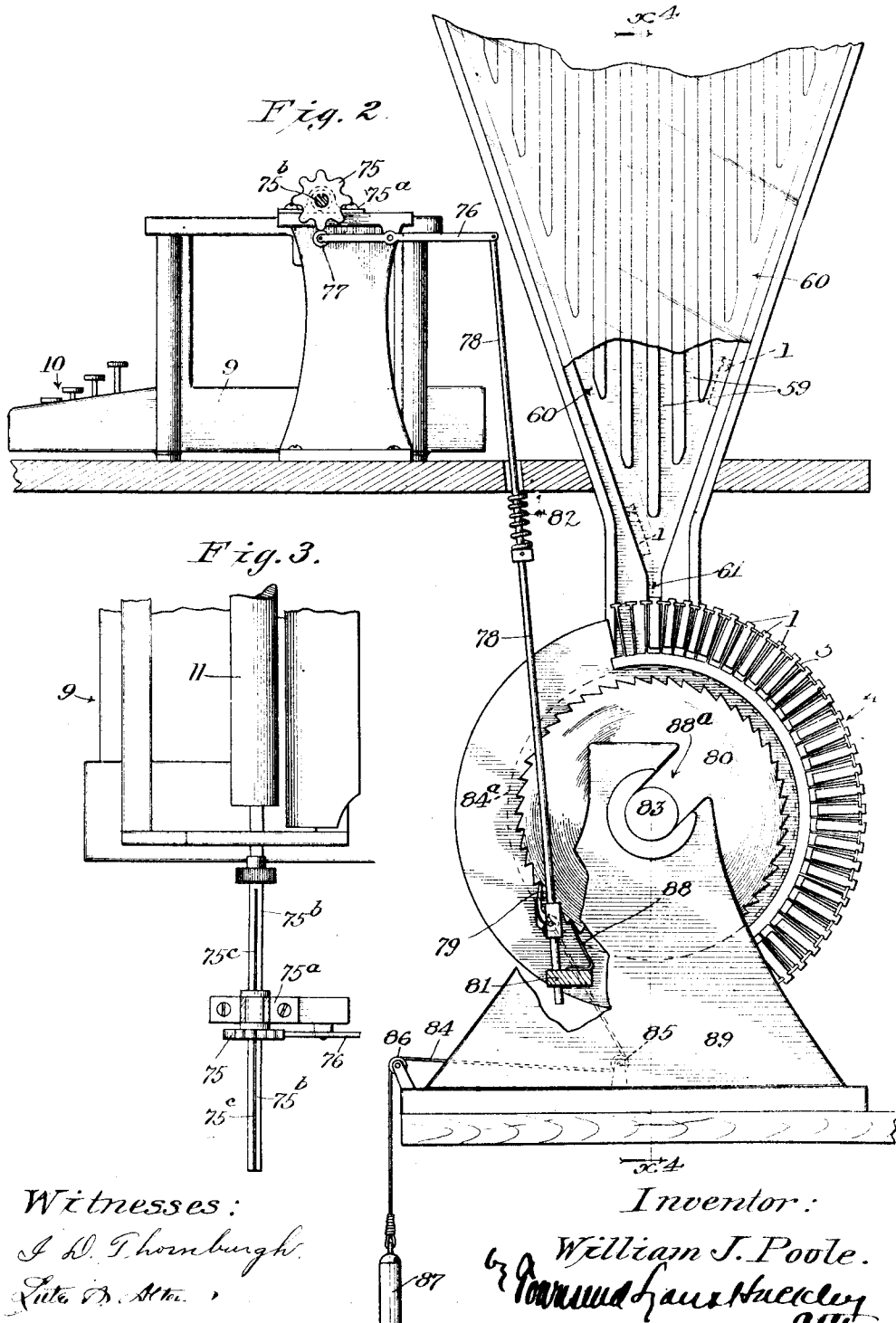
Inventor:
William J. Poole.
by *Samuel Gauss Hoelder* atty.

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5 SHEETS-SHEET 2.



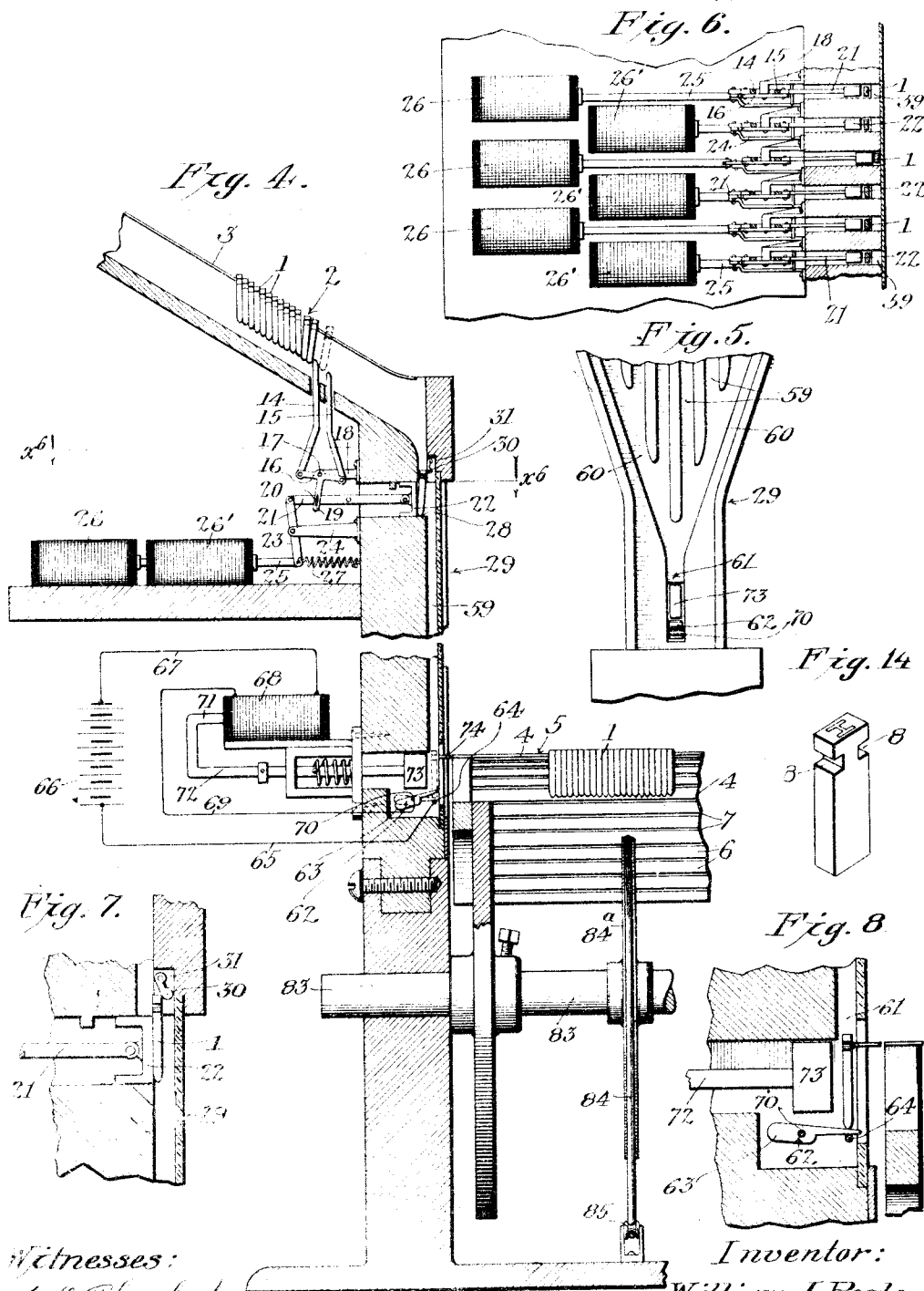
Witnesses:
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5 SHEETS-SHEET 3.



Witnesses:
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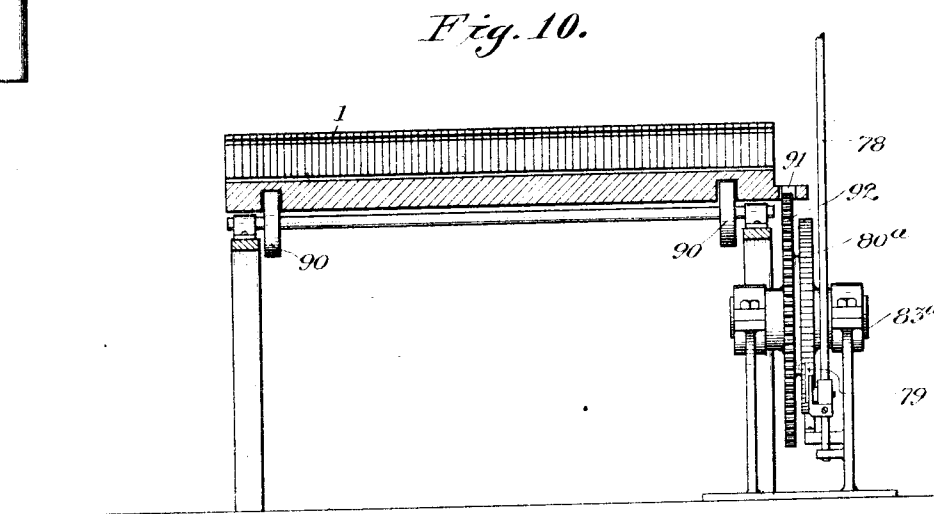
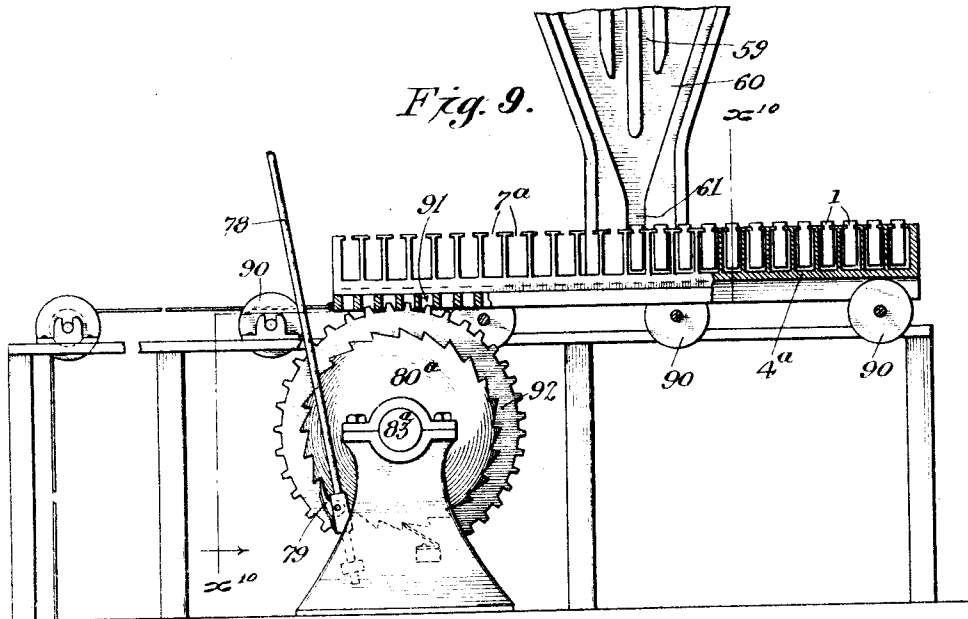
Inventor:
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Printers

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5 SHEETS—SHEET 4.



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5 SHEETS SHEET 5.

Fig. 11.

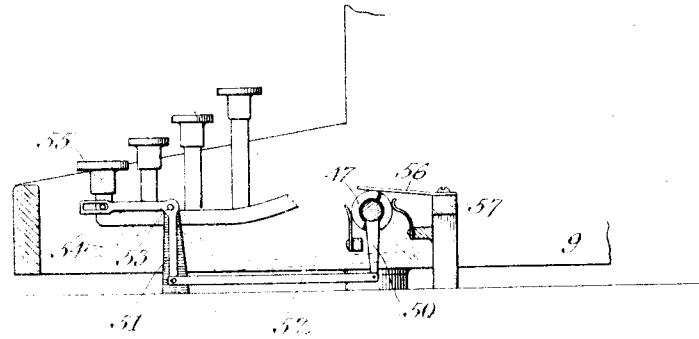


Fig. 12.

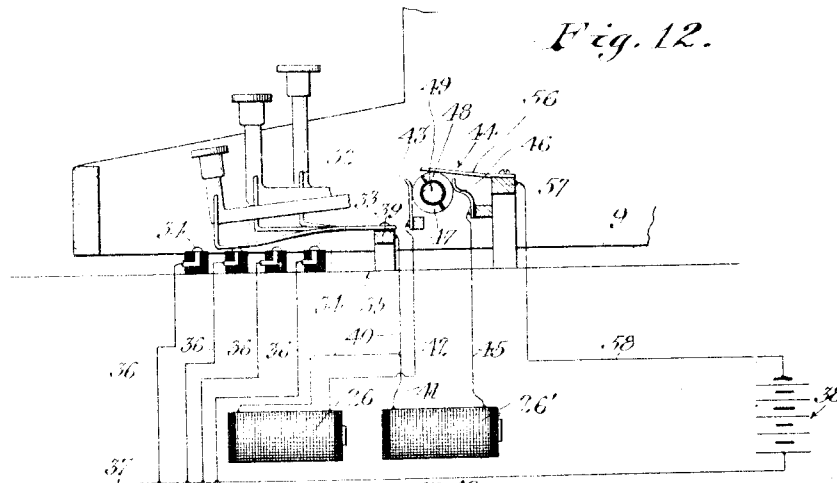
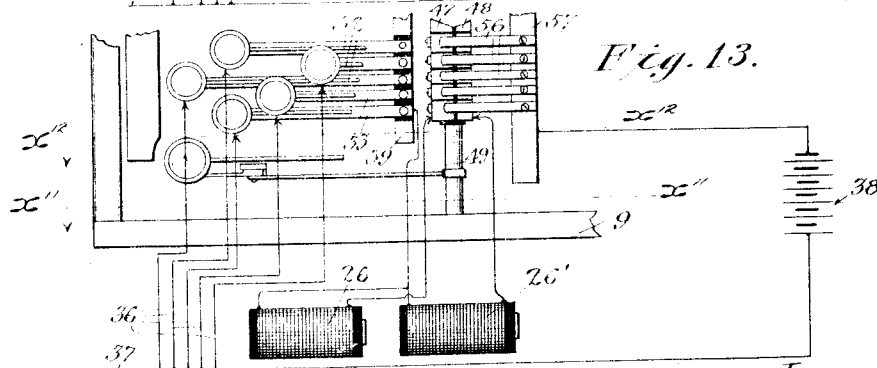


Fig. 13.



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UNITED STATES PATENT OFFICE.

WILLIAM J. POOLE, OF LOS ANGELES, CALIFORNIA.

TYPE-COMPOSING MACHINE.

1,032,564.

Specification of Letters Patent.

Patented July 16, 1912.

Application filed March 28, 1911; Serial No. 617,481.

To all whom it may concern:

Be it known that I, WILLIAM J. POOLE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Type-Composing Machine, of which the following is a specification.

This invention relates to machines for composing type and comprises essentially a key operated mechanism for setting type in a suitable form ready for printing.

The invention is particularly adapted for setting type in a type holder either flat or cylindrical to be set in a printing machine of the nature of the polygraph or multi-graph, wherein the sheet when printed generally resembles a typewritten sheet. Heretofore in such machines it has been necessary to set the type by hand. With my invention, I provide mechanism which by means of mechanical or electrical connection, is operated by any suitable keyboard, which latter may be that of an ordinary typewriter, for placing a type in the machine upon pressing a key in the keyboard. Thus, a typewriter operator may readily operate my type setting machine and the invention is thus of great value for use in establishments wherein this class of work is done.

While the invention is of especial value in the class of work mentioned, nevertheless, its use is not restricted thereto, as will be apparent from the following description.

I prefer to employ a typewriter suitably combined with the type controlling and handling mechanism whereby the further advantage is gained of typewriting a sheet in the typewriter simultaneously with the setting of corresponding type in the type holder, whereby at the conclusion of the composition, the typewritten paper which has been produced upon the typewriter furnishes substantially a proof of the form of type as set up in the printing machine.

Referring to the drawings: Figure 1 is a perspective view of the machine. Fig. 2 is an end elevation of the machine with a portion of the fan removed. Fig. 3 is a plan view, partly in section, of the right-hand end of the typewriting machine with associated elongated platen spindle. Fig. 4 is a vertical section on line x^4-x^4 Fig. 2. Fig. 5 is a side elevation of the lower portion of the fan chute. Fig. 6 is a section on line x^6-x^6 Fig. 4. Fig. 7 is an enlarged view of the upper plunger and adjacent parts on the

same section as in Fig. 4. Fig. 8 is an enlarged view of the lower plunger and adjacent parts on the same section as shown in Fig. 4. Fig. 9 is a view similar to Fig. 2, showing the flat form of type holder. Fig. 10 is a section on line $x^{10}-x^{10}$ Fig. 9. Fig. 11 is a vertical section through the keyboard of a typewriter and multiple oscillating switch showing connections of the latter with the shift key of the typewriter, the view being on line $x^{11}-x^{11}$ Fig. 13. Fig. 12 is a vertical sectional view on line $x^{12}-x^{12}$ Fig. 13, part of the view being diagrammatical to illustrate the electrical connections. Fig. 13 is a plan view of what is shown in Figs. 11 and 12. Fig. 14 is a perspective view of a type.

The type 1 are arranged in a magazine 2, the latter having a series of inclined rails 3 arranged in pairs, all the types of a certain letter and case being supported between a certain pair of rails. The type are to be transferred from the magazine 2 to the type holder 5, the latter in one form consisting of a cylinder 4 with longitudinal type holding bars 6 arranged in pairs forming slots 7 between them, each slot being adapted to receive a line of type. The type, as shown in Fig. 14, are provided with a pair of notches 8 on each side thereof near one end, which notches engage the rails 3 when the type are in the magazine and thus support the type therein and when they are in the type holder 4 the notches engage the rails 6.

9 designates the typewriter with keyboard 10, platen 11 and type bars 12, all of which may be of the usual or any preferred construction. I have provided means whereby upon depressing a key of the typewriter, the type 1 corresponding to that key will be transferred from the magazine 3 to a position in the type holder 4 and at the same time, the typewriter operates its type bar 12 and imprints the typewriter letter corresponding to the same key, on the sheet of paper 13 in the typewriter. Thus, upon pressing the key "a" of the typewriter, that letter will be printed upon the sheet of paper 13 by the typewriter; at the same time, a type bearing the letter "a" will be delivered from the magazine 2 and placed in the type holder 4. As the line is printed on the sheet 13 of the typewriter, type having the corresponding letters are delivered from the magazine to the type holder 4, so that upon the completion of the line of typewriting on

the sheet 13 there will be a corresponding line of type set in the type holder 4.

I have provided means whereby at the completion of the setting of each line of type, the type holder 4 of the printing machine will be automatically turned to bring a vacant slot 7 into position to receive a line of type, upon the platen 11 of the typewriter being turned to move the sheet of paper 13 into position to receive the next line of type-writing. Thus, the operator by operating the typewriter 9 in the usual manner will also cause type corresponding to the letters written in the typewriter to be set up in the type holder 4 of the printing machine.

The magazine 2 is arranged on an incline, as shown, so that when the lower type of a row in the magazine is released, that type which is released will pass down by gravity out of the magazine. Fig. 4 shows the mechanism for transferring the type from the magazine to the type holder of the printing machine. An escapement device is employed for controlling the escape of a type from the magazine and consists of two bars 14 and 15 which are pivoted to opposite ends of a T-lever 16, the latter being pivoted at 17 to a bracket 18 and having a slotted arm 19 which engages a pin 20 on a connecting rod 21, the latter operating a plunger 22 at one end and being connected at its other end to a lever 23 pivoted to a standard 24, the lever 23 being operated by the armature 25 of a solenoid 26, the spring 27 serving to normally hold the armature 25 extended with the plunger 22 in retracted position and the T-lever 16 tilted in such a position that the bar 14 is elevated and the bar 15 lowered. It should be understood that two solenoids 26, 26' with a keyboard employing a shift key with their associated mechanisms just described, are provided for each type key of the typewriter and each solenoid 26, 26' has electrical connections with its associated typewriter key, whereby, when the typewriter key is operated, one or the other of the solenoids 26, 26' will be energized. When the solenoid 26 is energized, its armature 25 rocks the lever 23 and advances the connecting rod 21 which tilts the T-lever 16 and lowers the rod 14, at the same time lifting the rod 15, and as the rod 14 lowers, it releases the lowest type 1 which it had been retaining and the type 1 thereupon moves downward by gravity, and is arrested by the bar 15. The type 1 is thus arrested but momentarily, however, as the bar 15 immediately descends and the bar 14 raises quickly enough to catch the succeeding type, so that only one type is released at a time. During the inward stroke of the solenoid armature 25, the plunger 22 is moved outwardly and pushes the type 1 in front of it off from the shoulder 28 and the latter falls down the fan chute 20. The type which

rests on the shoulder 28 is removed therefrom by the plunger 22 at the time the bar 15 is elevated during the escapement movement before described, so that the shoulder 28 is vacated by the time the released type from the magazine has arrived at the shoulder. When the type is released from the magazine by the escapement device, it passes down by gravity and drops on the shoulder 28. It assumes a slightly tilted position, as shown, with its upper end resting against a pendent pivoted weight 30, the latter having sufficient inertia to hold the type from falling and being of such a length that as the plunger 22 moves outwardly to expel the type, the upper end of the type clears the pendent 30 as the latter swings rearwardly to accommodate the type which is being pushed off the shoulder 28. Obviously, in pushing the type from the shoulder 28, if the type is to remain in a vertical position, so that it will readily fall down the fan chute, a recess 31 must be provided to receive the upper end of the type, otherwise, the type would have to tilt to pass off the shoulder 28 and thus without the pendent weight 30 the upper end of the type might swing into the recess 31 while resting on the shoulder 28 which is undesirable and it is for this reason that the pendent weight is provided, *i. e.*, to hold the type substantially in a vertical position, whereby when it is pushed off the shoulder 28, it will readily drop into the fan chute 20.

Figs. 11 to 13 show the electrical connections between the solenoids 26 and the key levers of the typewriter. Arranged under the respective key levers 32 of the typewriter are spring contact blades 33, each of which is adapted to make contact with a stationary contact 34 on the base 35 of the typewriter, the contacts 34 being connected by wires 36 with a single wire 37 which leads to a battery 38 or other source of electrical energy. The respective spring contact blades 33 are secured to a bar 39, and, as shown in Fig. 13, are insulated from each other and each contact blade 33 is connected by a wire 40 with a solenoid 26 and by a branch wire 41 with a solenoid 26'. Each key of the typewriter thus controls two solenoids with a keyboard employing a shaft key, the solenoid 26 being arranged to release a type having a small letter and the solenoid 26' being arranged to control the release of a type having a large letter from their respective magazines. Wires 42 lead from the other poles of solenoids 26 to brushes 43 which are arranged on one side of a rotary multiple switch 44, while wires 45 lead from the other poles of solenoids 26' to brushes 46 on the opposite side of the rotary multiple pole switch 44. The switch 44 comprises a series of semi-circular segments 47 and 48 insulated from each other,

the segments 47 and 48 being arranged on a shaft 49, the latter, as shown in Fig. 11, having an arm 50 which is connected with a lever 51 by a rod 52, the lever 51 being
 5 pivoted at 53 and having a slotted arm 54 which engages the shift key lever 55 of the typewriter. A series of spring contacts 56 are secured to a supporting bar 57 and rest upon the top of the rotary switch and are
 10 adapted to contact either with the segments 47, as shown in Fig. 11, or with the segments 48, as shown in Fig. 12. Normally, the shift key lever 55 is elevated and the segments 47 lie under the contacts 56 and upon
 15 depressing the shift key lever 55 to print a capital letter the foregoing described connections turn the rotary multiple pole switch into the position shown in Fig. 12, so that the segments 48 are in electrical
 20 connection with the contacts 56. A wire 58 leads from the bar 57 to the battery 38.

In printing a small letter, the operation and circuiting is as follows: The segments 47 are in connection with the contacts 56, as
 25 shown in Figs. 11 to 13, and when the key lever 32 is depressed it moves its spring contact 33 into contact with a contact 34, whereupon circuit is established from that contact 33 through the associated wire 40 with the
 30 associated solenoid 26, thence through wire 42 to contact 43 to segment 47, contact 56, bar 57, wire 58, battery 38, wire 37, wire 36, contact 34 and spring contact blade 33, thereby energizing solenoid 26 which is associated with that key of the typewriter, and solenoid
 35 26 upon being energized actuates the type releasing mechanism previously described to release a type having a small letter from the magazine.

40 When it is desired to print and set a capital letter, the shift key 55 must be depressed also and with a regular key lever 32 and shift key lever 55 depressed, the rotary multiple pole switch is shifted into the position
 45 shown in Fig. 12 and a circuit is established as follows: From spring contact blade 33 which is associated with the regular key lever 32 which had been depressed, through wire 40 and branch 41, through solenoid 26,
 50 through wire 45, to brush 46, segment 48, to contact 56, bar 57, wire 58, battery 38, wire 37, wire 36, contact 34, and spring contact blade 33, thereby energizing solenoid 26, and the latter actuates the mechanism for re-
 55 leasing a type having a capital letter. Solenoid 26 is not energized at this time because wire 42 connected therewith is not in circuit with the contact 56, the multiple pole switch having been turned to break the contact be-
 60 tween segments 47 and contacts 56.

65 The fan chute 29 into which the type falls from the magazine comprises a series of vertical passages 59, there being a passage 59 for each row of type in the magazine and each being in communication therewith. The

lower ends of the passages 59 vary in elevation and communicate with side passages 60 which converge toward the bottom of the fan chute, as clearly shown in Figs. 1 and 2, the two passages 60 at the bottom of the fan
 70 chute uniting in a single passage 61, thus when a type is pushed off from the shoulder 28 it passes down through the associated vertical chute 59 until it arrives at one of the side passages 60 and then travels down
 75 the latter until it enters the single passage 61 at the bottom. Upon passing into the passage 61, the type strikes a pivoted lever 62 having a weighted end 63 which serves to soften the fall, so that the type does not be-
 80 come damaged. The lever 62 also acts to complete an electrical circuit by striking a contact pin 64, whereupon a circuit is established through a wire 65 which is connected
 85 with pin 64, through battery 66 or other source of electrical energy, through wire 67, to solenoid 68, thence through wire 69, to the pivot 70 of the lever 62. The solenoid 68 has an armature 71 with an offset 72 which is
 90 returned and parallels the solenoid and carries a plunger 73 on its end which is adapted to push the type from its position resting on the lever 62 into the type holder 4 of the printing machine.

The side wall of the passage 61 is provided
 95 with two ribs 74 which act to guide the notches 8 of the type onto the bars 6 of the type holder 4, the ends of the ribs 74 lying closely to the ends of the bars 6, so that as
 100 the type is pushed off from the lever 62, the type cannot fall.

After a row of type has been set in the slot 7 of the type holder, the type holder is automatically turned to bring a vacant slot
 105 7 into position to receive the type which are to form the next line. The number of type in the line of type in the type holder will correspond to the number of letters in the line which has been written on the sheet of
 110 paper in the typewriter, so that the turning of the type holder 4 should be accomplished during the time that the platen of the typeholder is placed in position for commencing the next line. This is accomplished by the
 115 mechanism shown in detail in Figs. 2 and 3. As shown in Fig. 3 a cam 75 is journaled in a bearing 75^a at a point about at the limit of the farthest outward position of the right-hand end of the platen and an extension 75^b
 120 of the platen shaft has a quill 75^c which slides through the cam 75, thereby permitting the longitudinal travel of the typewriter carriage without disturbing the cam 75, and yet causing the cam 75 to be turned
 125 whenever the platen is turned. A rod 78 extends from the lever 76 downward and carries a pawl 79 which acts against a ratchet wheel 80 said lever being pivoted and having a roller 77 on one end and bearing on the
 130 cam 75. The lower end of the rod 78 is slid-

able in a support 81 and a spring 82 serves to normally hold the rod 78 in a depressed position with the roller 77 up against the cam 75. The ratchet wheel 80 is mounted on the shaft 83 of the type holder 4. A cord 84 is attached to a sheave 84^a on the shaft 83 and passes over pulleys 85 and 86, and has a weight 87 on its end, whereby the cylinder 4 and its ratchet 80 are kept under a constant torque which causes the teeth of the ratchet wheel 80 to firmly bear against a retaining pawl 88, whereby the cylinder is held so that its slot 7 is in perfect register with the type in front of the plunger 73. When the platen of the typewriter is turned before the writing of a new line on the sheet in the typewriter, the cam 75 turns with the platen and one of the convolutions in its face permits the roller end of the lever 76 to move upwardly so that the spring 82 is allowed to depress the rod 78 and cause the pawl 79 to engage another tooth of the ratchet wheel 80, and as the lever 76 is moved back so that its roller rests against the outer part of the convolution of the cam 75, the rod 78 is lifted so that its pawl 79 turns the ratchet 80 one tooth, thereby bringing a vacant slot 7 of the type holder 4 into register with the opening 61 and ready to receive the type which are to form the new line.

The shaft 83 of the type holder rests in slots 88^a in standards 89 which permit the type holder to be easily removed when the form has been set. The type may be transferred from the type holder 4 into the cylinder of the printing machine in any desired manner by bringing the respective lines of type in the type holder into register with their respective slots in the printing machine.

Fig. 9 shows a type holder having a flat bed 4^a and having slots 7^a which receive the type. The type holder 4^a is mounted to ride horizontally on rollers 90 and is provided with a rack 91 which is engaged by a gear 92 on the shaft 83^a. The shaft 83^a carries a ratchet wheel 80^a and the latter is operated by mechanism similar to that used in the foregoing described form. Thus, when the rod 78 is actuated, the pawl 79 operates the ratchet 80^a and the latter turns shaft 83^a and gear 92, thereby carrying the type holder 4^a along to bring a vacant slot 7^a into register with opening 61.

What I claim is:—

1. In a composing machine, a typewriter having a platen and keys, a magazine, a type holder provided with a series of parallel type holding means forming slots adapted to hold lines of type, means operated by each key for transferring a type from the magazine corresponding to that key to a slot in the type holder, and means controlled by said platen for shifting said

type holder to bring a vacant type holding means into receiving position when the platen is shifted to start a new line of writing in the typewriter.

2. In a composing machine, a magazine, a series of key levers corresponding to the alphabet, a shift key lever, two electric means associated with each of the series of key levers for controlling the removal of type from the magazine, one of said electric type controlling means being operated by the depression of its associated key of the series of keys, whereby a lower case type is removed from the magazine, the other of said electric type controlling means being operated upon depressing the key lever associated therewith and the said shift key, whereby a corresponding upper case type is removed from said magazine.

3. In a composing machine, a magazine provided with a series of inclined type guiding means, escapement devices for the respective type guiding means, a vertical transfer chute communicating with the lower end of the magazine, a type holder at the lower end of the transfer chute, and means for arresting a type immediately after its release from the escapement device, means for subsequently moving the type laterally to permit it to descend the transfer chute, a solenoid having a connection with said escapement devices and said last means for operating the same simultaneously.

4. In a composing machine, a magazine provided with a series of inclined type guiding means, escapement devices for the respective type guiding means, a vertical transfer chute communicating with the lower end of the magazine, a type holder at the lower end of the transfer chute, means for arresting a type immediately after its release from the escapement device, and for subsequently moving the type laterally to permit it to descend the transfer chute, a solenoid having a connection with said escapement devices and said last means for operating the same simultaneously and means at the bottom of the transfer chute for moving a type laterally out of said chute into said type holder.

5. In a composing machine, a magazine, a type holder provided with a series of parallel type holding means, a transfer chute with a type delivery passage at its lower end for transferring type from the magazine to said type holder, a typewriter provided with key levers and with a platen movable both longitudinally and rotatably, means operated by the respective key levers of the typewriter for releasing corresponding type from the magazine and causing the same to be transferred to the type holder, and means operated by the rotation of the platen for shifting the type holder a definite distance, to bring a vacant type

holding means into register with said type delivery passage.

6. In a composing machine, a magazine, a transfer chute, a series of key levers, a shoulder at the upper end of the transfer chute adapted to arrest type at the upper end of the transfer chute, a series of plungers for the respective kinds of type, electric means for operating the respective plungers immediately after a type corresponding to a plunger has been arrested by the

shoulder, whereby the type is pushed from the shoulder by said plunger and arranged to fall down the transfer chute.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 23 day of March, 1911.

WILLIAM J. POOLE.

In presence of—

G. T. HACKLEY,
FRANK L. A. GRAHAM.