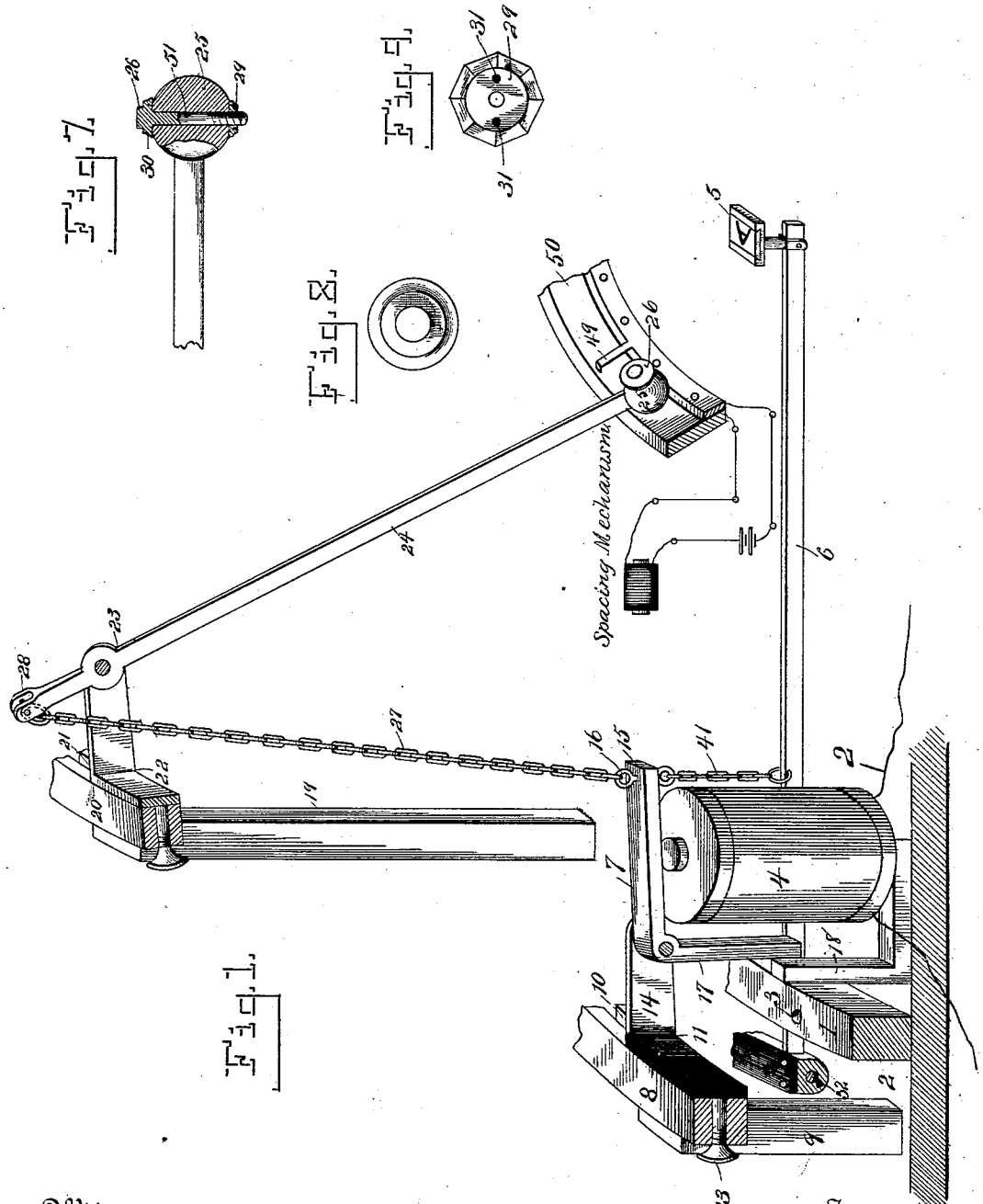
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J. F. McLAUGHLIN.

ELECTRO MECHANICAL TYPE WRITER.

No. 385,565. Patented July 3, 1888.



Witnesses.
Harry S. Rohrer.
R. Mason.

Inventor
James F. McLaughlin.
By his Attorneys Harding & Richmor

N. PETERS. Photo-Lithographer. Washington, D. C.

(No Model.) 3 Sheets—Sheet 2.

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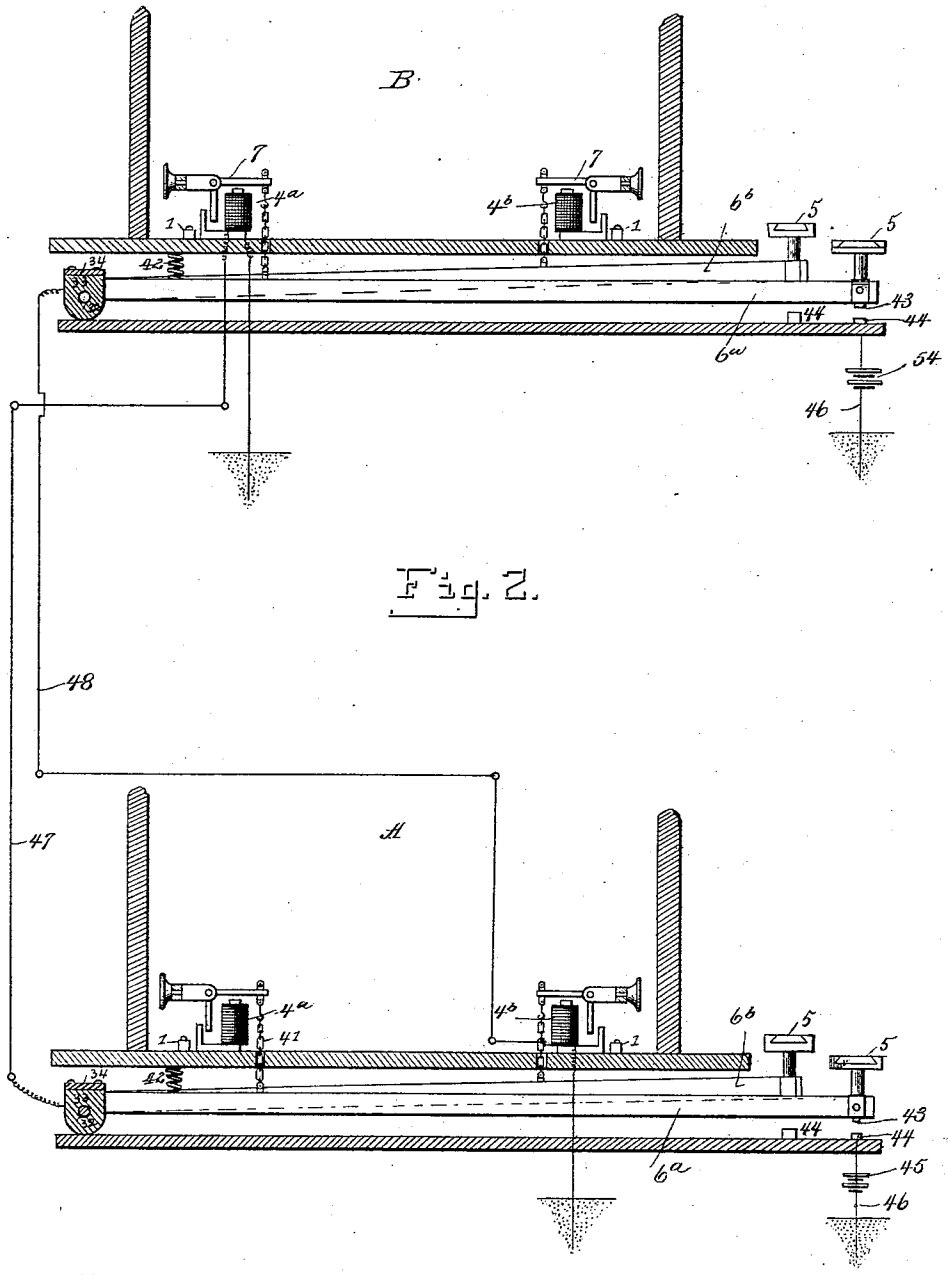


Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

J. F. McLAUGHLIN.

ELECTRO MECHANICAL TYPE WRITER.

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Fig. 3.

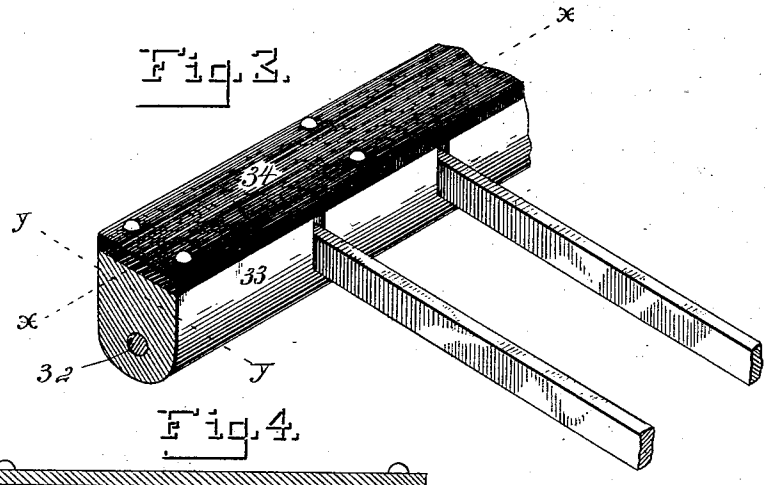


Fig. 4.

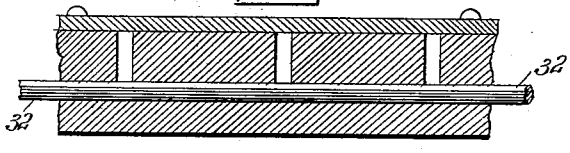


Fig. 5.

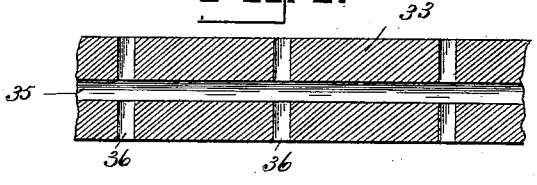
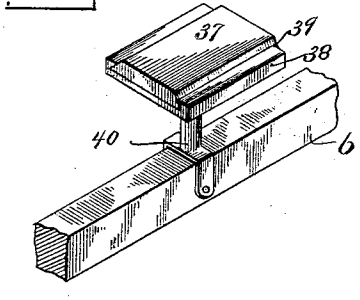


Fig. 6.



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UNITED STATES PATENT OFFICE.

JAMES F. McLAUGHLIN, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRO-MECHANICAL TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 385,565, dated July 3, 1888.

Application filed March 26, 1887. Serial No. 232,548. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McLAUGHLIN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electro-Mechanical Movements for Type-Levers and Adjustable Type Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a combined mechanical and electro-mechanical movement for the type-levers of my electrical type-writer, which forms the subject-matter of several applications now pending in the United States Patent Office—that is to say, this invention has for its object to adapt the aforesaid instrument, when placed, respectively, at two extremities of a line-wire, to record or imprint a letter or character locally at one extremity of said line by a single mechanical action of the key-board and corresponding type-lever, to utilize such mechanical action to simultaneously impart and transmit an electrical impulse to the distant extremity of the line, and to effect the registration of a corresponding letter or character at such distant extremity by the electro-mechanical movement of a similar type-lever.

My invention consists in an organization of apparatus whereby these objects may be attained, and in certain details of construction, arrangements, and combinations of parts, which will be more fully described hereinafter, and the specific points of novelty in which will be designated in the appended claims.

My invention consists, further, in the new and improved construction of type-levers, key-board, and letter-type, whereby the style of letters, characters, or symbols used, both on the type-levers and key-board, may be readily and conveniently removed and interchanged, as will be hereinafter described.

Referring to the accompanying drawings, which illustrate certain appliances for carrying out my invention, Figure 1 is a perspective view with parts broken away and partly in section, showing the arrangement and construction of the type-levers and auxiliary parts when used locally in a mechanical manner. Fig. 2 is a diagrammatical view illustrating two of my movements, respectively, at each extremity of two line-circuits, showing how they may be operated in a combined mechanical and electro-mechanical manner. Fig. 3 is a detail perspective view, partly in section, of the pivotal support for the key-levers. Fig. 4 is a longitudinal section on line *x x*, Fig. 3. Fig. 5 is a transverse section on line *y y* of Fig. 3. Fig. 6 is a detail perspective, with parts broken away, showing the manner of mounting and securing the interchangeable finger-key upon the key-levers. Fig. 7 is a detail view, partly in section, of the end of the type-lever, showing the construction of the insertible type. Fig. 8 is a top plan view of the end of a type-lever shown in Fig. 7. Fig. 9 is a view in elevation of the securing-nut for the removable letter-type.

Like numbers of reference indicate corresponding parts in all the figures of the drawings.

Referring to the drawings by numbers, 1 indicates a metallic conducting-ring, which is suitably fastened to the base 2 and provided with a series of binding-posts, 3 3, (only one being shown,) located at proper intervals thereupon, opposite and corresponding to a series of electro-magnets, 4 4.

Before proceeding further with an explanation of the different features of this invention it may be necessary to here state that only the component and essential details have been shown which are deemed sufficiently clear for a comprehensive understanding of the following description. Therefore it will be understood that only two of a series of circularly-arranged magnets, 4 4, and two type-levers are shown; that the traveling carriage, paper-roll, paper-feeding and inking mechanism, the letter and line spacing devices, and other details of arrangement and construction of parts, which are unnecessary for a clear understanding of the nature and operation of this invention, have not been illustrated.

The series of electro-magnets 4 4 correspond in number and relative situation to the keys 5 5 of the key-levers 6 6, and are secured in circular order inside of and in proximity to to the ring 1 upon a suitable base of hard rub-

ber or other insulating material (not shown) fastened to the bottom 2 of the casing of the instrument. Each of these magnets is of the ordinary construction, except their lower poles are each converted and brought up parallel to the side of its magnet-helix, forming substantially an elbow-shaped frame, as shown, the object of such construction being to utilize the magnetic force of attraction of both poles upon the respective extremities of the rectangular-shaped armatures 7 7, as shown in Fig. 1.

8 designates a non-conducting slotted ring of greater diameter than the ring 1, and supported in the elevated position by the standards 9 9 (only one being shown) the requisite height above the base 2 to allow the pivoted armatures 7 7 to be above, yet in proximity to, their respective electro-magnets. This ring is provided with a central annular slot, 10, running circumferentially therein, and in which are secured the adjustable supporting plates or brackets 11 11, having the armatures 7 7 pivotally connected between their inwardly-projecting extensions by pivot-pins. (See Fig. 1.)

The adjustable supporting-plates 11 11 consist each of a base-plate, 12, made preferably of some insulating substance and formed curved or convex to conform with the curvature of the ring 8, the adjusting-screw 13, and the parallel supporting arms or lugs 14 14, between which latter is pivoted one of the rectangular elbow-shaped armatures 7 7, as shown in Fig. 1, one support being broken away to show the section of the pivot-pin, having its horizontal arm 15 provided with a perforation, through which is passed the double eye-bolt or pintle 16, the perpendicular arm 17 of said armature projecting downwardly in the vicinity of the pole 18 of the magnet 4.

19 is one of a suitable number of standards which support and secure the type-lever ring 20 the desired height above the base 2 of the casing. This ring is of less diameter than ring 8, and is similarly provided with an annular transverse slot, 21, running centrally and circumferentially therein, the object of this construction being to allow the type-lever-supporting brackets 22 to be adjusted at regular intervals or degrees around the ring and at any desired angle in the said slot. Each one of these type-lever-supporting brackets 22 is of the same construction as the plates 11 11, and serve, respectively, as pivotal supports for the fulcrumed weighted type-levers 23 23, which carry each a type-letter, character, or punctuation-mark corresponding to its respective key 5. The series of type-levers, only one of which is shown, are, as before stated, fulcrumed near the upper ends by a suitable pivot-pin between the projecting lugs of the supporting-brackets 22 22, and are each formed of a single straight metallic rod, 24, of a length equal to a radius of the ring 20. Upon the forward free end of each rod 24 is depended or secured a perforated ball or weight, 25, into which are respectively placed one of the insertible and interchangeable types 26, (see Fig. 7,) and the upper end of said rod is formed bifurcated, as shown, the upper end of the flexible link-connection 27 being secured upon a pin, 28, between the prongs, and the lower end of said link-connection being suitably fastened to the double eye-bolt 16, hereinbefore described.

The letter-type 26 is formed of hardened steel, as shown, with the letter or character upon its face. These type are each made substantially in the form of a headed bolt, with its stem 51 piercing the ball 25, and screw-threaded on its lower end to allow the adjustable clamping-nut 29 to be fastened upon the extremity or portion which projects beyond the under side of the ball 25, such construction allowing the type to be securely fastened in its seat and to be vertically adjusted at different heights above the plane of the upper portion of the weight-ball. The head or shoulder 30 fits squarely upon the top surface of the ball 25, which is flattened or leveled both on its bottom and top surfaces, as shown clearly in Fig. 7.

The nut 29 may be made in various forms, as desirable—such, for instance, as the style shown in Fig. 9, which is formed with two apertures, 31 31, designed to admit the entrance of a bifurcated key, (not shown,) whereby the same may be removed and readjusted or interchanged.

All of the type-levers 23 23 are of exactly the same length, and have their supports so arranged in the circular slot 21 that they will strike at a central point when forced up against the inking-ribbon. (Not shown.) The metallic key-levers 6 6 are pivotally secured at their forward ends to a transverse non-conducting rod, 32, which is loosely mounted in a wooden boxing, 33. (See Figs. 3, 4, and 5.) This boxing is provided with a removable lid or top of hard rubber, 34, and with a longitudinal circular aperture, 35, in which is loosely inserted the pivot-rod 32, before mentioned.

36 36 represent a series of transverse perpendicular slots in the said boxing to admit of the entrance and pivotal play of the levers 6 6.

5 5 are the finger-keys carrying the letters, &c., which are attached to the outward ends of the parallel key-levers 6 6.

The letters of the key-board are each suitably delineated upon an ivory or celluloid or other insulating-plate, 37, as shown in Fig. 6, which plate is provided with sloping or inclined sides, and is adapted to slide under the lateral flanges of the key-support 38, the object of this construction being to allow the letter-plates to be easily removed for cleaning or other purposes.

The key-support 38 consists of an upper plate, 39, having the flanges before mentioned, and the bifurcated stem 40, the whole being

preferably formed in one single piece. This key holder or support is rigidly fastened to all of the key-levers by a pin passing through the forked ends of the stem 40 and the levers 6 6, as shown in Fig. 6.

41 designates a flexible link-connection substantially similar to the connection 27, which is attached at its upper end in the lower eye of the eyebolt 16, and at its lower end is secured suitably to its respective key-lever 6. In accordance with such arrangement it would then be preferable to have the base provided with a series of apertures in a perpendicular line with the ends of the horizontal arms of the armatures 7, thereby allowing the parallel key-levers to be below said base and the flexible connections to pass through said apertures. The armatures 7 7 correspond in number and relative situation with their respective keys and key-levers. Thus it will be readily understood that by means of the interchangeable and removable letter-type and letter-plates the style of printing performed by the machine may be readily and conveniently varied by simply substituting the desired style of characters, letters, or symbols, which can be accomplished in a comparatively short space of time by means of the adjustable devices before mentioned. Furthermore, by this construction I am enabled to utilize stenographic characters, if desired. Furthermore, inasmuch as both the letter-type and finger-keys are removable, the style of finger-keys can be correspondingly changed to accord with any variation or substitution of letter-type. For example, if the ordinary English letter-type was supplemented by stenographic characters and the old finger-plates remained upon the keys, it would be impossible for the operator to determine what key to depress in order to effect the imprint of the desired stenographic character.

Referring to the diagrammatical view shown in Fig. 2, each lever 6^a and 6^b is provided with a suitable retracting-spring, 42, for the obvious purpose of restoring the lever to its normal position after depression. Directly underneath each key 5 and on the under side of each key-lever 6^a 6^b is located a small contact-point, 43, which is designed to make contact with a similar point, 44, when a key is depressed, the contact-point 44 being in circuit with the battery 45 or 54 by wire 46, and the levers 6^a 6^b, carrying the points 43 43, being in circuit with their corresponding electro-magnets, 4^a and 4^b, by wires 47 and 48, respectively.

In Fig. 2 at each extremity of two line-circuits is placed one of the before-described movements. The depression of the lever 6^a at the station A will cause the type-lever shown in Fig. 1 to be forced by mechanical action up against the paper-roll, (not shown,) and at the same time such depression will close the circuit from the battery 45 and simultaneously cause the magnet 4^a at station B to be energized and to attract its respective pivoted armature, and thereby effect the registration of its corresponding type-lever against a paper-roll and making a similar imprint, but in an electro-mechanical manner. When the circuit is broken by the removal of the operator's finger and by the restoration of the lever 6^a by the retracting agency of its spring, the magnet 4^a at station B will be de-energized. Likewise the depression of the lever 6^b at station B will effect the imprint of its respective type-lever against a paper-roll in a mechanical manner and a similar imprint of a corresponding type-lever at station A in an electro-mechanical manner.

I have deemed it necessary in order to clearly illustrate my invention to show two independent line-circuits in Fig. 2, the said circuits extending, respectively, between each key-lever 6^a and 6^b at the station A or B to its corresponding magnets at the other or distant station. However, it will be understood that any equivalent arrangement of circuits may be adopted, since it is obvious that the manner of connecting the circuits forms no part of this invention.

The armatures and their respective type-levers being arranged circularly above the base 2, the key-levers 6^a and 6^b being substantially the diameters of the circle around which the said armatures and type-levers are disposed, and the said key-levers being preferably of different lengths for economizing space for the letters on the key-board, it will be apparent that the shorter levers, 6^b 6^b, will have to be depressed a greater distance than if they terminated in the outer row. Therefore it will again be obvious that the distance from the contact-points 43 43 of said shorter levers to the points 44 44 is greater than from such points on the longer levers, as shown in Fig. 2.

When any one of the type-levers 23 23 reaches the limit of its descent, the ball 25 will strike one of the spring-fingers 49 49, which are shown in Fig. 1, thereby effecting the contact of the inwardly-projecting stud of said finger with the ring 50, thus closing a secondary circuit which operates the spacing mechanism, the electro-magnet of which is shown in Fig. 1, the retractibility of the spring-fingers being sufficient to overcome the force of the fall of the particular type-lever and the weight of the ball 25.

The auxiliary parts and devices necessary for the efficient operation of the features herein shown and described have been illustrated, described, and claimed in my several pending applications respectively bearing serial numbers 219,616, 217,338, 218,698, and 221,239, and filed, respectively, on November 23, 1886, October 27, 1886, November 12, 1886, and December 10, 1886. Such, therefore, are not described or claimed herein; but

What I do claim is—

1. The combination, with the circuit-closing key-levers, of intermediate mechanism con-

necting each key-lever with its respective type-lever, whereby the imprint of the said type-lever is mechanically effected by the depression of its respective key-lever, the electro-mechanical devices at a distant extremity of a line operated by each depression of the said key-levers for effecting an imprint of a corresponding type-lever at said distant extremity simultaneously with the registration before mentioned, the circuit, and a suitable source of electricity, the whole being arranged to operate in a manner and for the purpose set forth.

2. The combination, with the circuit-closing key-levers, of a suitable connection between said levers and the series of type levers, the type-levers, the line-circuit, and a suitable source of electricity, the whole being arranged to close an electrical circuit simultaneously with the depression of a key-lever and the consequent imprint of a type-lever, as specified.

3. In combination, a series of electro-magnets, each provided with a pivoted armature connected with one of a series of type-levers, a series of pivoted type-levers carrying upon their free ends the insertible letter-type, the circuit-closing levers each attached by a suitable connection with one of the series of pivoted armatures, the line-circuit connecting each of said key-levers with a corresponding electro-magnet at a distant extremity of the said line, the second series of electro-magnets at said distant extremity respectively in circuit with their corresponding key-levers at the first-mentioned extremity, and a suitable source of electricity, all arranged to operate substantially as specified.

4. The combination of the current-conducting circuit-closing key-levers pivotally secured at their inner ends to a pivot-rod, the retracting-springs, the insulated boxing supporting said pivot-rod and having the transverse recesses 36 36 for the ends of the key-levers, the circuit, and a suitable source of electricity.

5. The circuit-closing key-levers, the intermediate mechanism connecting the said key-levers with their respective pivoted type-levers and adapted to mechanically effect an imprint of a type-lever by the depression of any one key-lever, the series of pivoted type-levers provided each with a ball or weight at its forward free end for the purpose of closing a local circuit upon the descent of its respective type-lever, the spring contact-fingers and ring, and the local circuit, in combination with the primary circuit, as specified.

6. The combination, with the pivoted type-levers carrying the weight-balls provided with insertible adjustable letter-type, of the pivoted key-levers having removable letter-plates, as shown, and the link-connection between the said key and type levers, as set forth.

7. The pivoted type-levers provided each with removable insertible type and suitable perforated balls or weights at their free ends for the dual purpose of closing, by virtue of their weight, the local circuit and supporting the adjustable insertible type, and means for operating said pivoted type-levers and the local circuit, as set forth.

8. The combination of the series of pivoted type-levers provided with balls or weights on their free ends, the balls or weights having a perpendicular aperture therethrough, and the adjustable interchangeable letter-type, as set forth.

9. The combination of the weight-balls affixed to the free ends of the type-levers, the insertible adjustable letter-type having shoulders on their upper ends and screw-threaded at their lower extremities, and means for securing said letter-type in the weight-balls, as described.

10. The combination of the type-levers, consisting each of a straight metallic rod formed bifurcated at its upper end and provided at its lower extremity with a weight-ball having a perpendicular aperture therethrough, the whole being formed in one single piece, with the letter-type having the letter or character upon its face, the stem, and shoulder, also all cast in one single piece, and the securing-nut, as specified.

11. The combination, with the key-levers, of the pivoted type-levers carrying the weight-balls provided with insertible adjustable letter-type, and a suitable connection between said key and type levers, as shown.

12. As a new article of manufacture, a type-lever provided with weight-balls provided with insertible adjustable letter-type, substantially as specified.

13. The combination, with the type-levers, of the weight-balls provided with insertible adjustable letter-type, the key-levers having removable letter-plates, and a suitable connection between said key and type levers, as specified.

In testimony whereof I affix my signature in presence of two witnesses.

J. F. McLAUGHLIN.

Witnesses:
E. L. WHITE,
GEO. H. TICHENOR.