

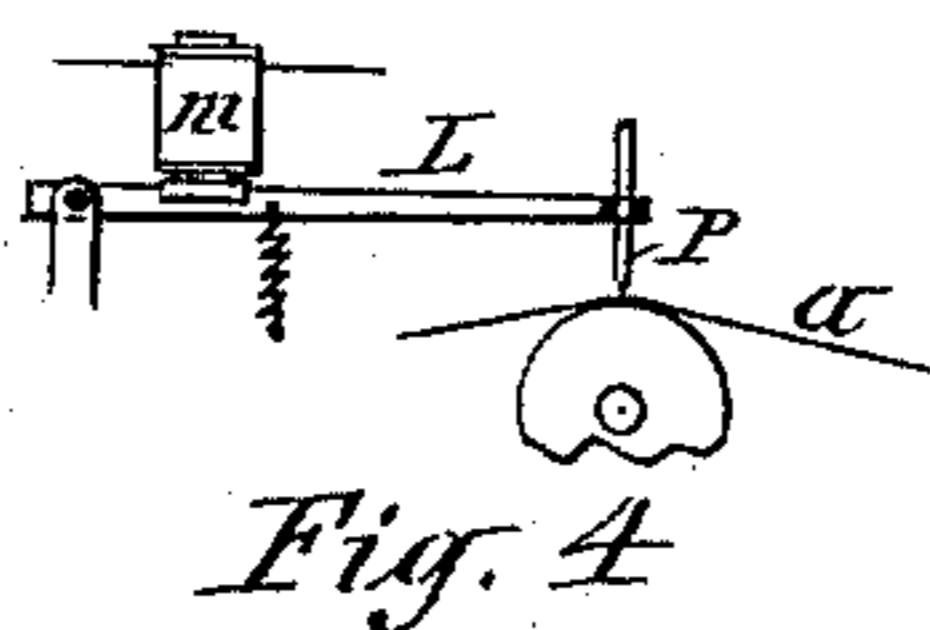
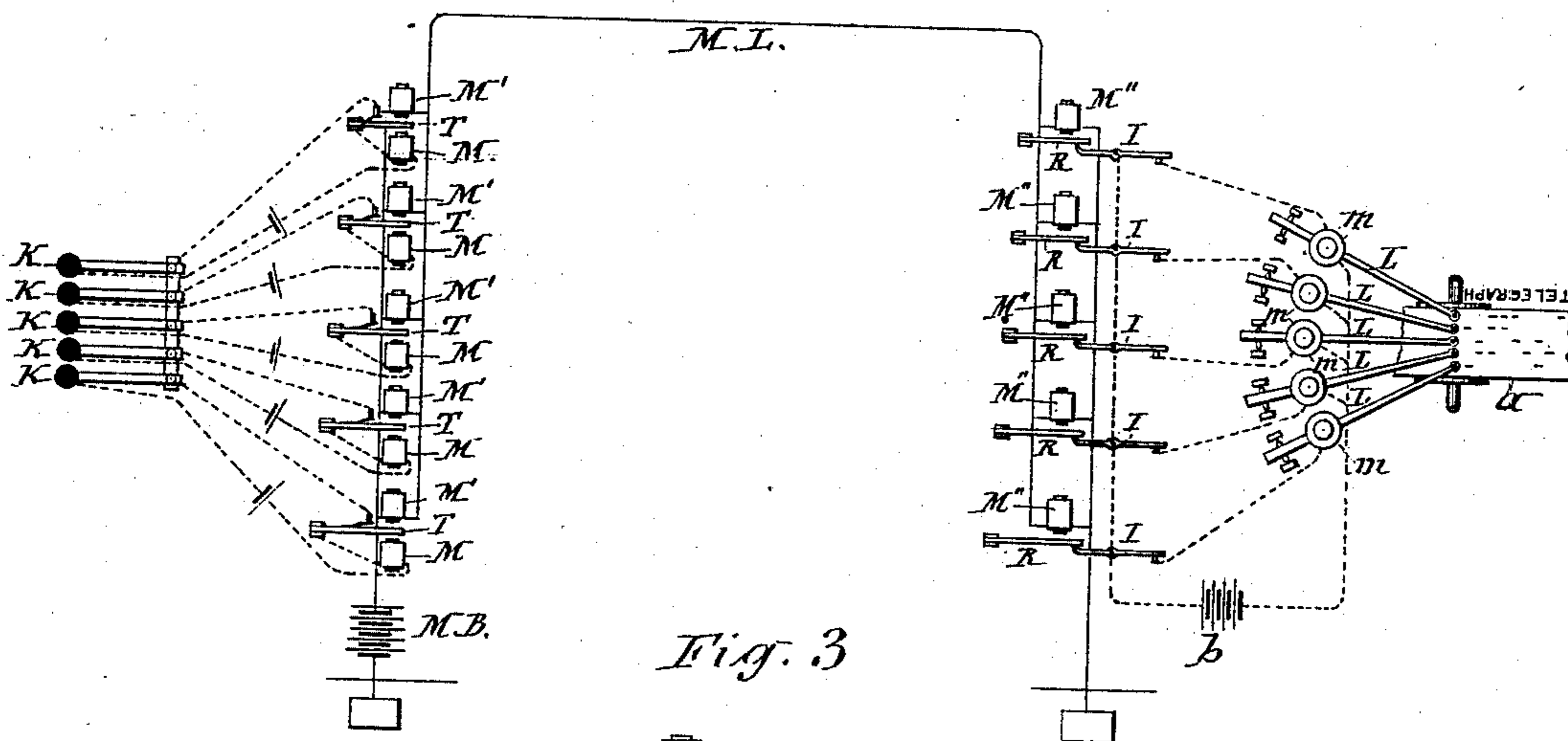
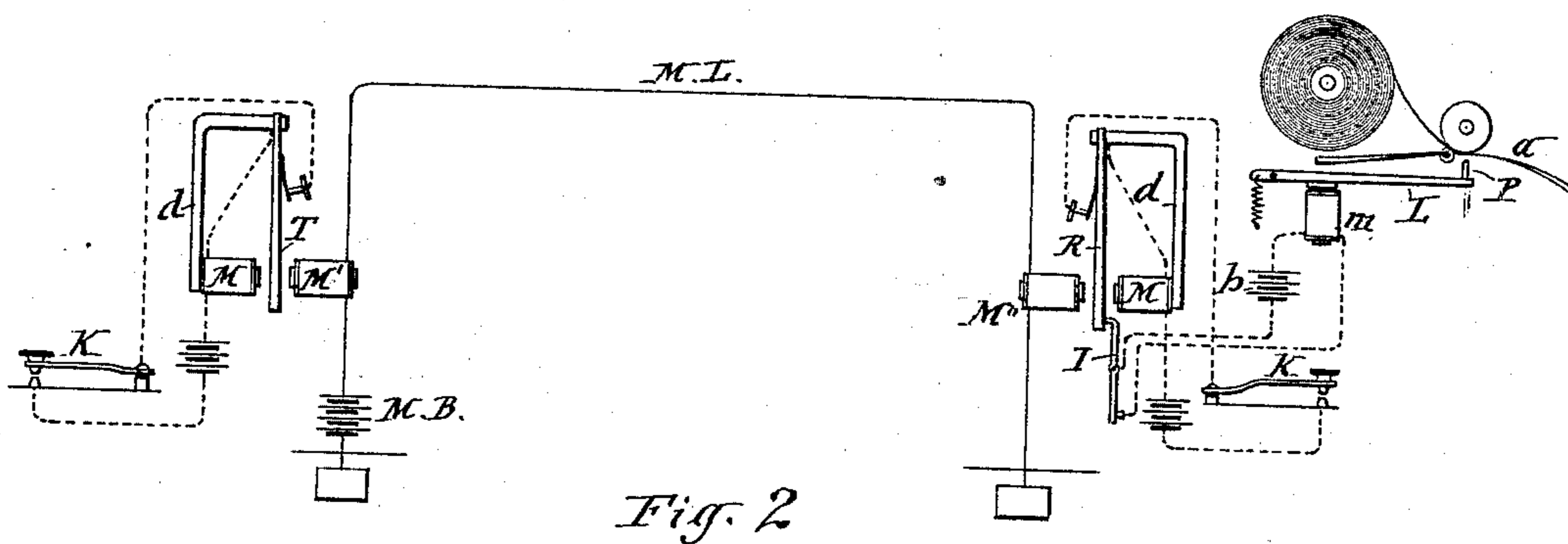
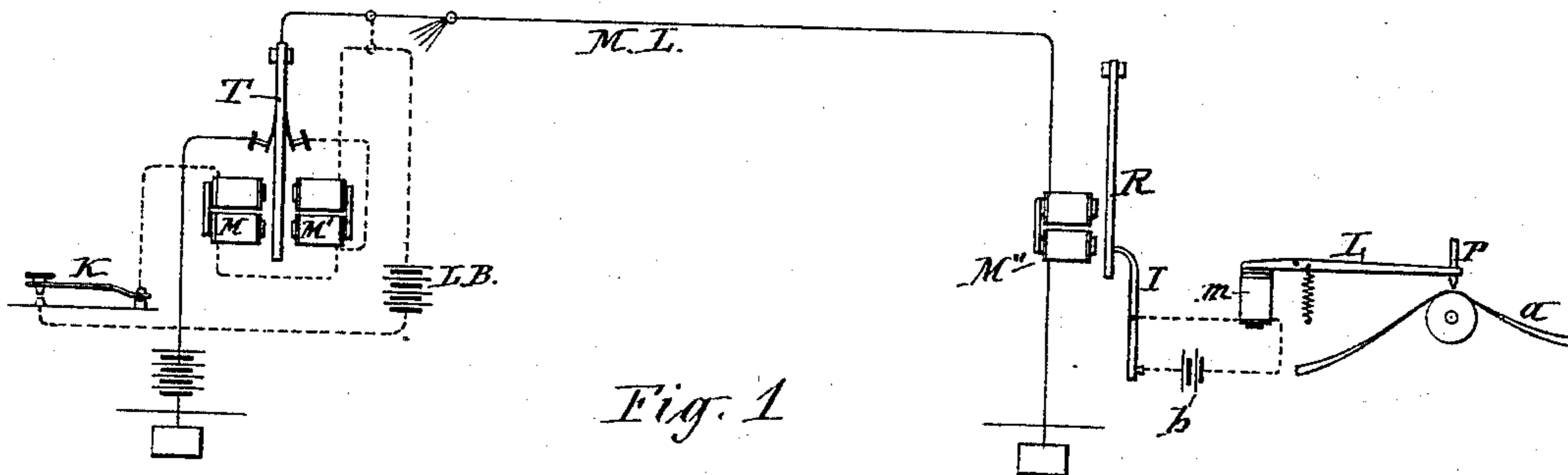
(No Model.)

M. W. DEWEY.

ELECTRO HARMONIC TELEGRAPHY.

No. 395,613.

Patented Jan. 1, 1889.



WITNESSES:

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MARK W. DEWEY, OF SYRACUSE, NEW YORK, ASSIGNOR OF TWO-THIRDS
TO EMIL LAASS AND CHARLES H. DUELL, OF SAME PLACE.

ELECTRO-HARMONIC TELEGRAPHY.

SPECIFICATION forming part of Letters Patent No. 395,613, dated January 1, 1889.

Application filed November 21, 1887. Serial No. 255,694. (No model.)

To all whom it may concern:

Be it known that I, MARK W. DEWEY, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and
5 useful Improvements in Electro-Harmonic Telegraphy, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to a system of tele-
10 graphy wherein pulsations or waves of different lengths are transmitted, either separately or simultaneously, through a single wire, and has for its object to increase the speed of telegraphic transmission of signals without ma-
15 terially increasing the expense of supporting such system.

In the common transmission of signals through a telegraphic circuit it is a well-known fact that both with the needle-tele-
20 graph and the Morse instrument it is necessary to depress a key several times at the transmitting-station, sending currents to line differing in length of duration or changes in polarity, in order to indicate or record a letter,
25 or character representing a letter, at the receiving-station. This consumes a great deal of time, and it takes but a small amount of business to keep a wire occupied continually, and necessitates the employment of several
30 wires, or a duplex or multiplex system, which requires the services of several operators. By my improved system one operator is enabled to send a message in one-fourth or one-fifth of the time that would be occupied in send-
35 ing the same by the old method, or one operator may transmit as fast as four or five using a multiplex system.

In the Morse system the letters that are used most are made by a fewer number of depres-
40 sions of the key than others in order to get greater speed. The letter e, occurring oftener than any other, is represented simply by a dot, which is made by a very short depression of the key. The other letters and marks are each
45 made in the time occupied in making from two to eight such simple signs. Now, it may be readily understood that if every letter is made as quickly as the letter e (represented by a dot) a great speed can be attained.

50 The object of my invention is to attain this speed of telegraphy by means of a single line-

wire and a minimum number of transmitters and reeds; and to that end my invention consists in the combination, with the electro-harmonic system, of a series of co-operating ma-
55 nipulative transmitting-keys arranged to be operated by one operator, and a corresponding number of recording-levers operated by the respective keys and arranged with their markers in a row at right angles to the line of travel of
60 the paper to print simultaneously side by side and in rows at right angles to the line of travel of the paper, each of said rows of marks representing a letter or character, all as hereinafter more fully described, and specifically set forth
65 in the claim.

Referring to the drawings, Figures 1 and 2 are diagrams showing the arrangement of circuits. Fig. 1 shows only one key, K, of the series located at the transmitting-station, and
70 one recording-lever of the series at the receiving-station. Fig. 2 is a similar arrangement adapted to transmit impulses of an undulatory character. In this figure at the station on the right both a transmitting-key and
75 a recording-lever are shown. It will be understood of course that a transmitting apparatus having several keys and a receiving-instrument having a corresponding number of re-
80 cording-levers may be located at all stations. Fig. 3 is a plan view of Fig. 2, showing five keys, a corresponding number of transmitting-reeds, receiving-reeds, and recording-levers, and also illustrating the style of record-
85 ing produced, the marks or dots on the strip of paper *a* representing the word "telegraph," as shown; and Fig. 4 shows a modification of the arrangement of the magnet and its arma-
90 ture in relation to the marking-lever actuated thereby.

In the figures, T represents the transmit-
ting-reed, five of which may be employed in a transmitting apparatus, each of said reeds possessing a different degree of flexibility, and consequently a different rate of vibration
95 when actuated by electro-magnets, said magnets being in a local circuit and controlled by keys in a well-known manner. The apparatus may be arranged to produce by means of the aforesaid reeds either pulsatory or undu-
100 latory currents to flow to line, which operate reeds at the receiving-station corresponding

in number and possessing corresponding degrees of flexibility with those at the transmitting-station. The receiving-reeds or analyzers R rest normally against circuit-breakers I, and when a reed vibrates it breaks a local circuit, of which b denotes the battery. In this local circuit is a magnet, m , which, when the circuit is closed, attracts its armature, which is fixed to a lever, L, holding a pen or pencil or other marker, P, in one end. While in this position the marker is held in proximity to but free from a rotary cylinder, over which passes a paper ribbon. The cylinder may be rotated by clock-work or other suitable means and either continuously or intermittently. When the circuit is broken, the magnet allows the lever L to bring the marker P in contact with the paper, and if the latter is at rest a dot is produced thereon, and if in motion a dash is produced on the same. I employ four or more of such keys and recording-levers, which latter I arrange with their markers in a row at right angles to the line of travel of the paper, and thus when two or more of the recording-levers are operated simultaneously to print the requisite number of marks to represent the desired letter or character, said marks are distributed side by side in a row across the paper. The number of transmitting-keys and recording-levers depends on the code of printing adopted.

In Fig. 1 each transmitting-reed T is connected with the main line M L, and preferably with a separate battery connected with said line. The transmitting-reed T is arranged between two magnets, M M', which are connected with the local battery L B, with which the key K is also connected, and a smooth current passes continually to line when all the transmitters are quiet; but when one or more of them are vibrated a portion or portions of the current are changed to what is termed "pulsatory currents." These pulsations pass through the receiving-magnets M'', placed close to reeds R, which may be either bars or ribbons adapted to vibrate to the same degree as the transmitting-reed T.

In Fig. 2 both the transmitting and receiving reeds are fixed to the uncovered leg d of one of the electro-magnets between which the

reed T is located, and through which magnet a local current passes when the key K is depressed to close the local circuit. This causes the reed to vibrate according to the degree of flexibility it possesses, and in its vibration it comes intermittently in proximity to the pole of the magnet M', which is connected with the main line and is charged continually by a battery, M B. The vibration of the reed T in this case induces pulsations or waves of an undulatory character in the main line, operating the reeds R at the receiving-station correspondingly. The same result may be obtained without the employment of a battery for the main line by substituting a permanent magnet for the core of the electro-magnet M'.

The described transmitting and receiving instruments may be arranged at both ends of the main line. By operating one or more keys simultaneously a single mark or a combination of marks are produced, each of said combinations representing a separate and distinct letter or character, and thus with five keys thirty-one different letters or characters can be printed. In the diagram, Fig. 3, five keys, K K, and five marking-levers, L L, are shown.

What I claim is—

In an electro-harmonic system, a plurality of manipulative transmitters arranged to be operated either separately or two or more simultaneously by one person, and a corresponding number of printers or markers actuated, respectively, by the aforesaid transmitters and arranged at right angles to the line of travel of the paper, and to produce by the simultaneous action of two or more of said printers or markers a corresponding number of marks in a row at right angles to the travel of the paper, and the row of marks so disposed representing a letter or character, as set forth.

In testimony whereof I have hereunto signed my name, in the presence of two witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 18th day of November, 1887.

MARK W. DEWEY. [L. s.]

Witnesses:

C. L. BENDIXON,
N. M. SEAMANS.