No. 712,939. Patented Nov. 4, 1902.

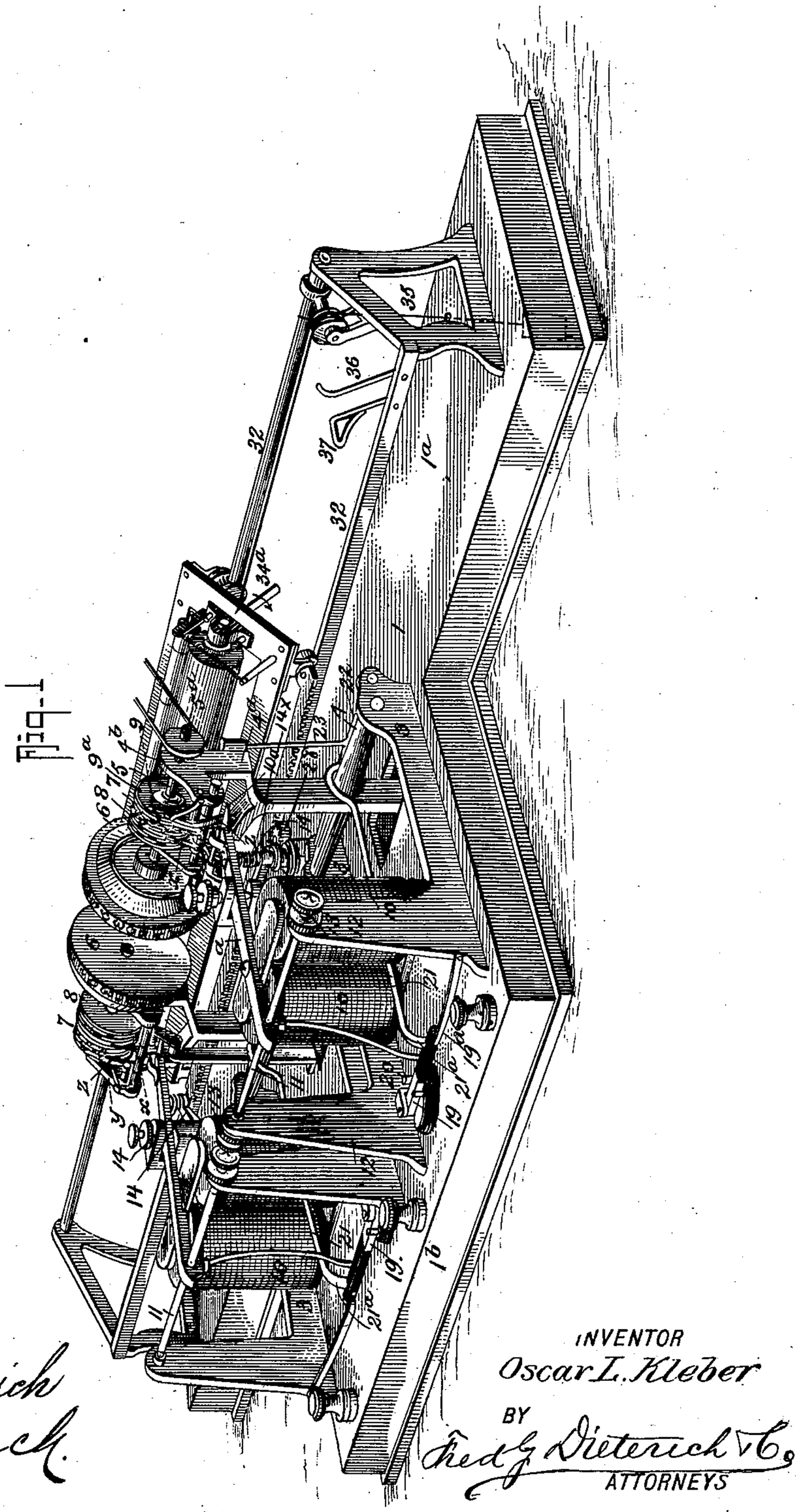
# O. L. KLEBER.

## PRINTING TELEGRAPH.

(Application filed Sept. 10, 1900.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.




WITNESSES:

Louis Dieterich

John C. Busch.

INVENTOR

Oscar L. Kleber

BY

Fred'g Dieterich & Co.

ATTORNEYS

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(No Model.) 4 Sheets—Sheet 2.

Fig. 2.

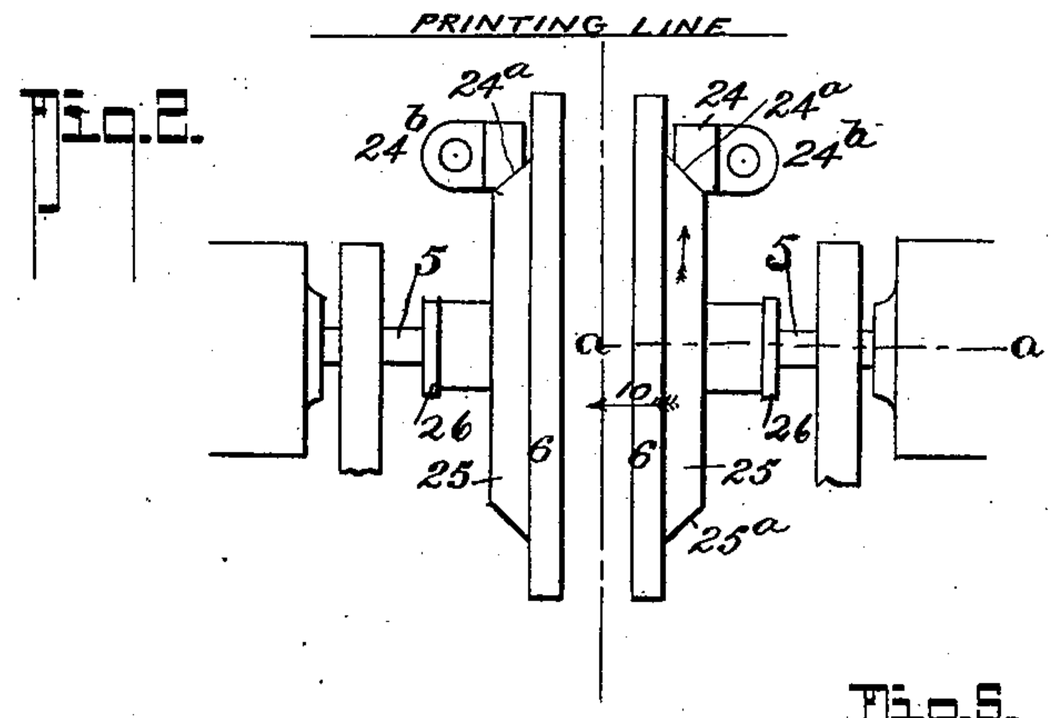



Fig. 2a.

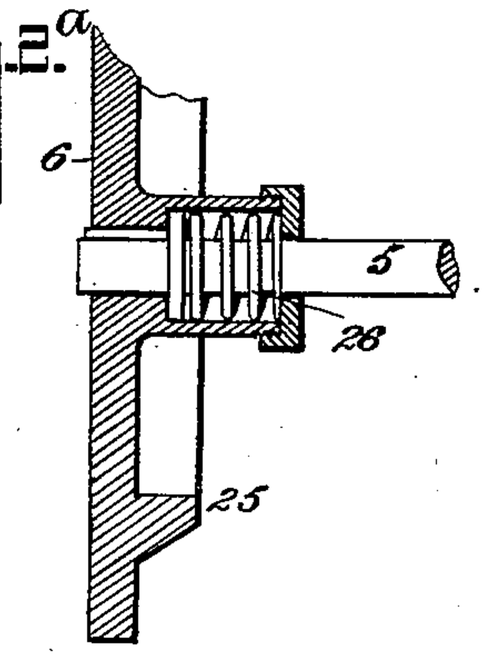



Fig. 5.

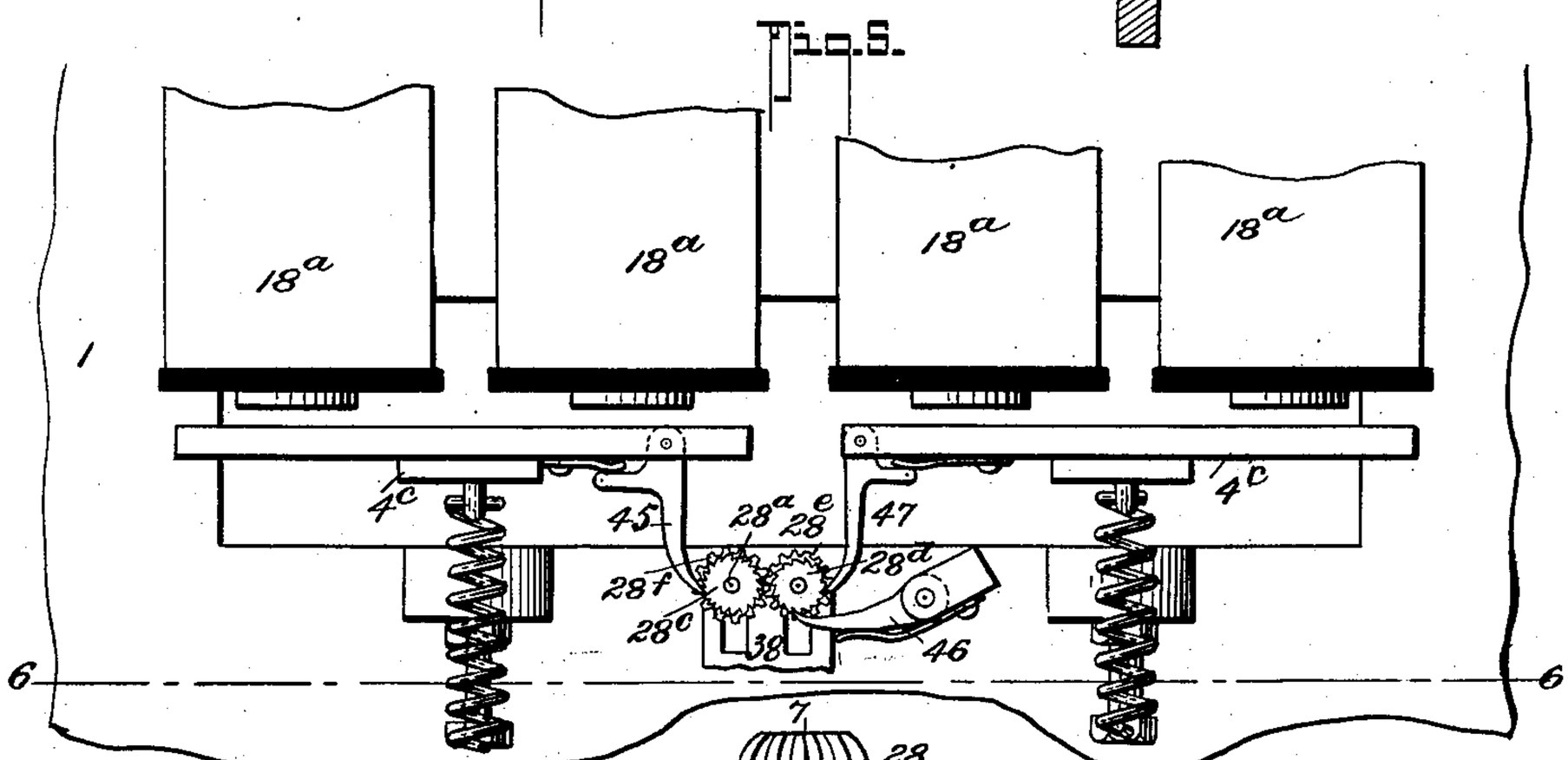
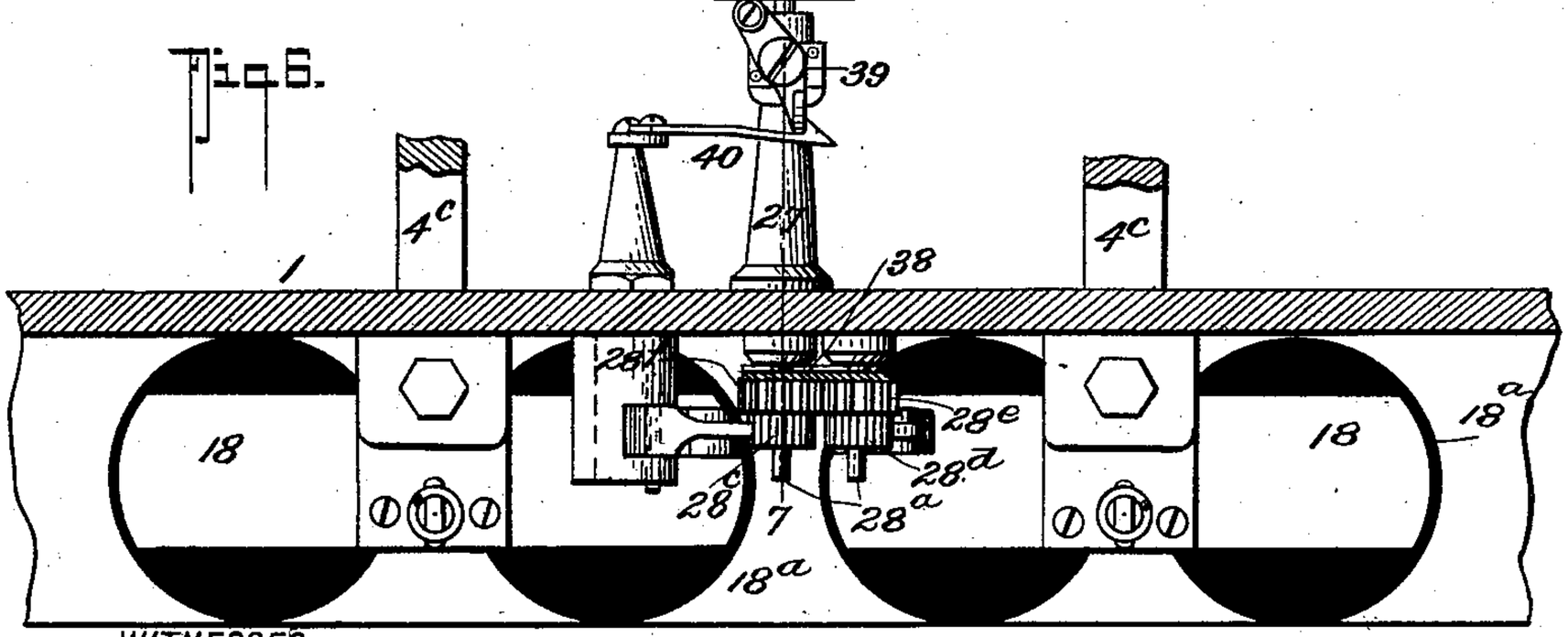



Fig. 6.




WITNESSES:

Louis Dieterich

John E. Burch.

INVENTOR

Oscar L. Kleber

BY

Fred'g Dieterich & Co

ATTORNEYS

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(No Model.) 4 Sheets—Sheet 3.

Fig. 3.

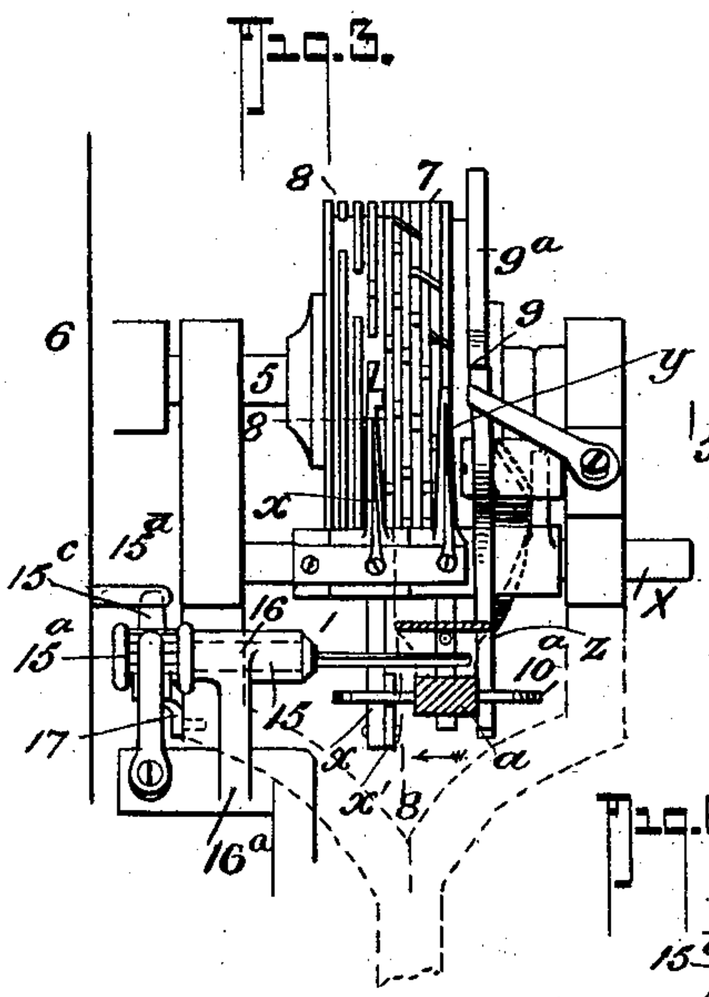



Fig. 4.

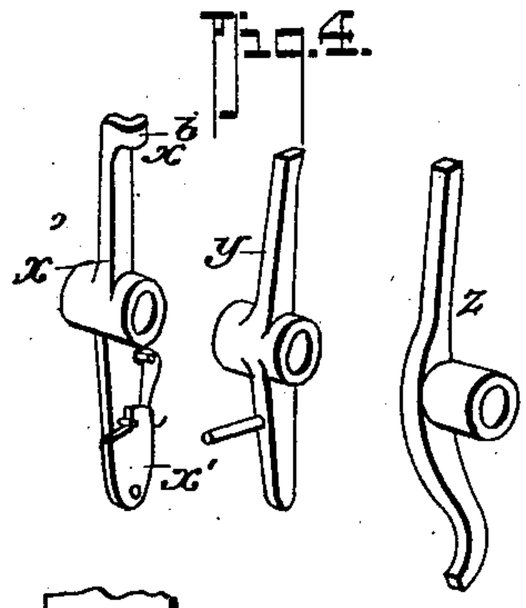



Fig. 8.

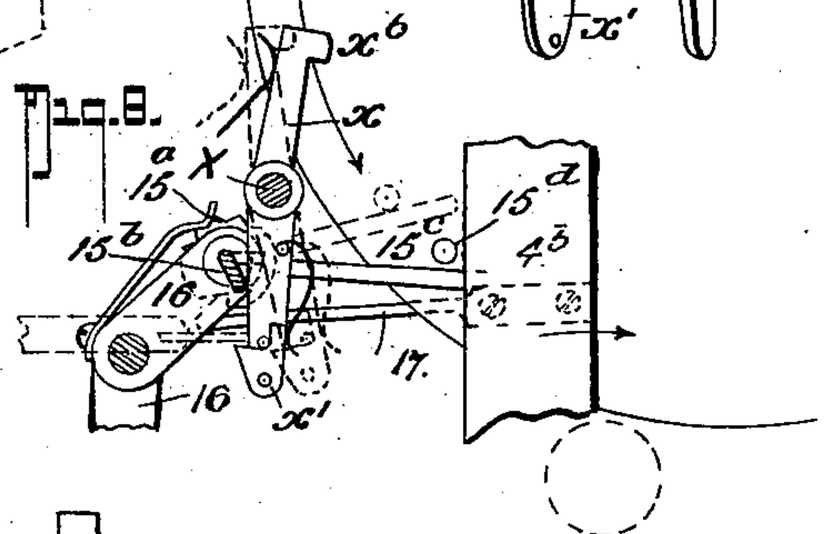



Fig. 10a.

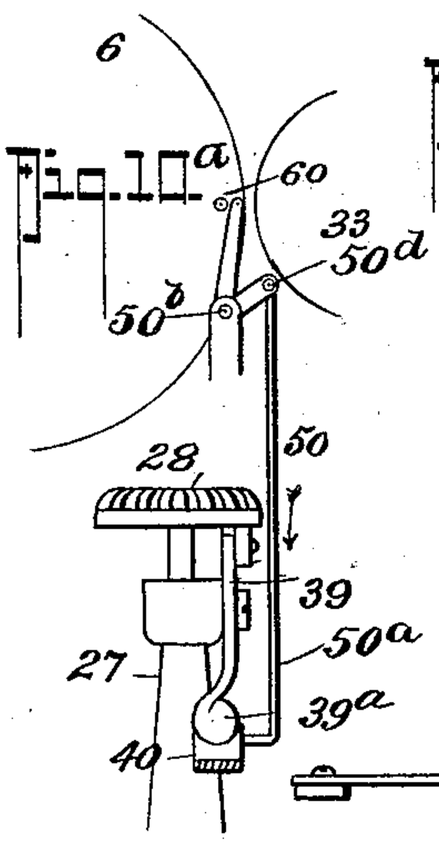



Fig. 10.

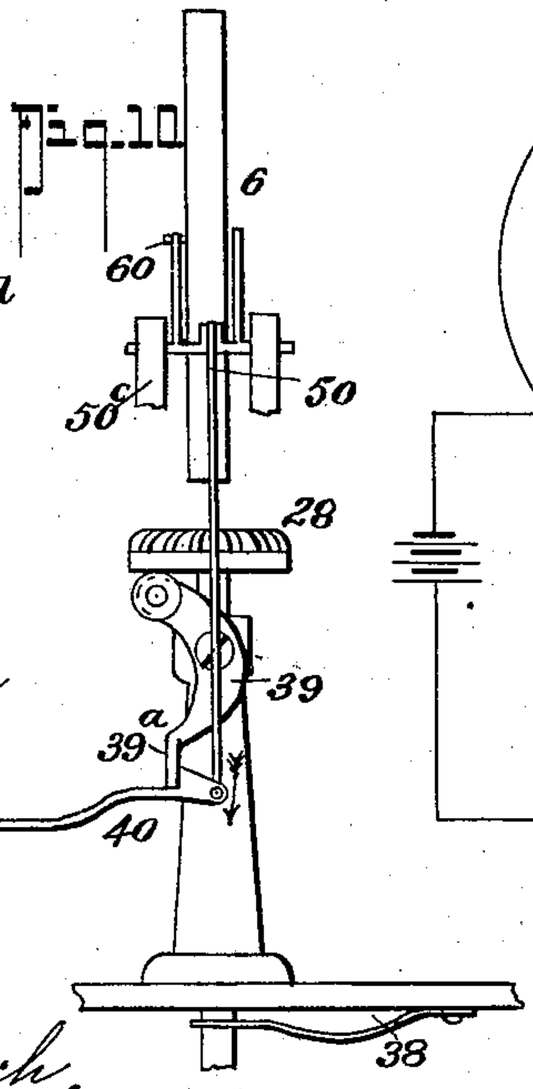
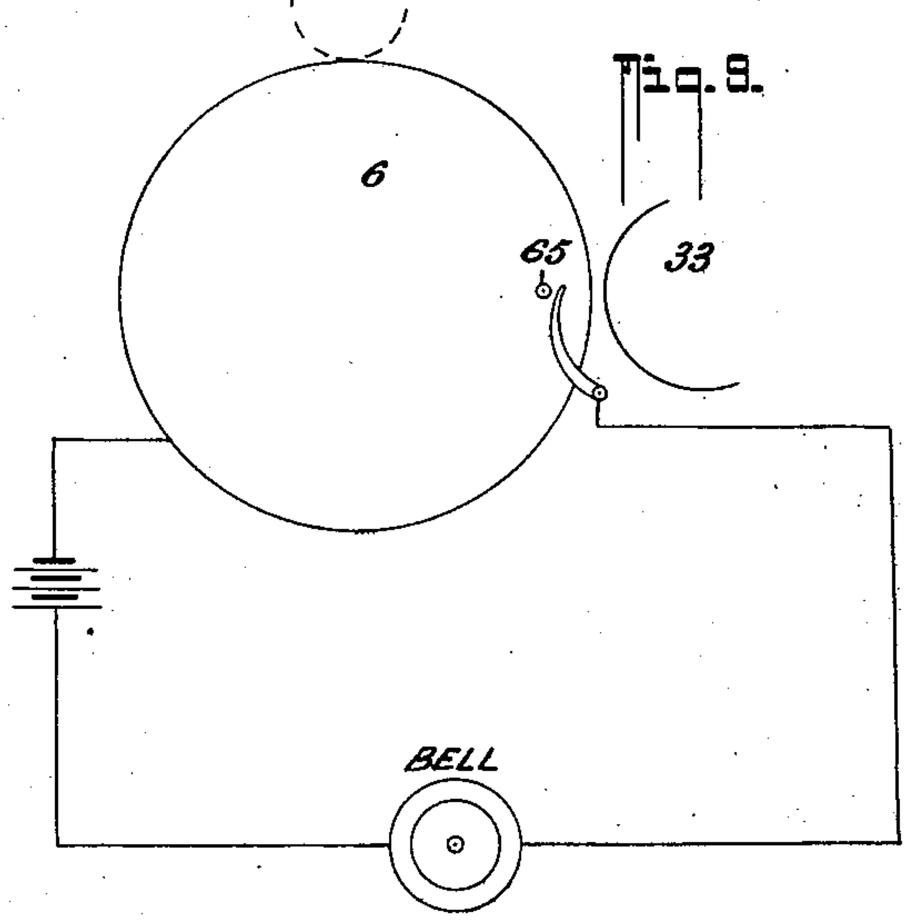



Fig. 9.




WITNESSES:
Louis Dieterich
John E. Burch.

INVENTOR
Oscar L. Kleber
BY
Fred'g Dieterich & Co
ATTORNEYS

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## PRINTING TELEGRAPH.

(Application filed Sept. 10, 1900.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 12.

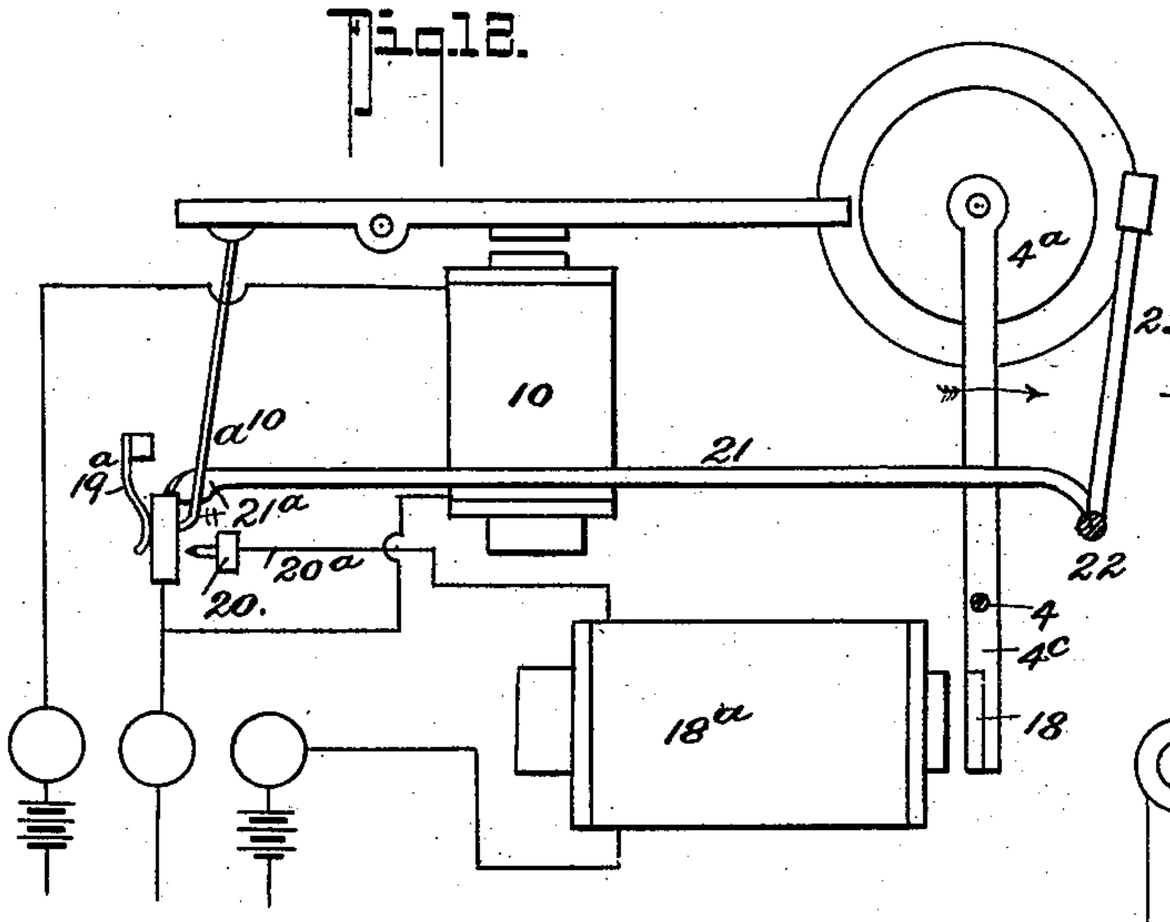



Fig. 13.

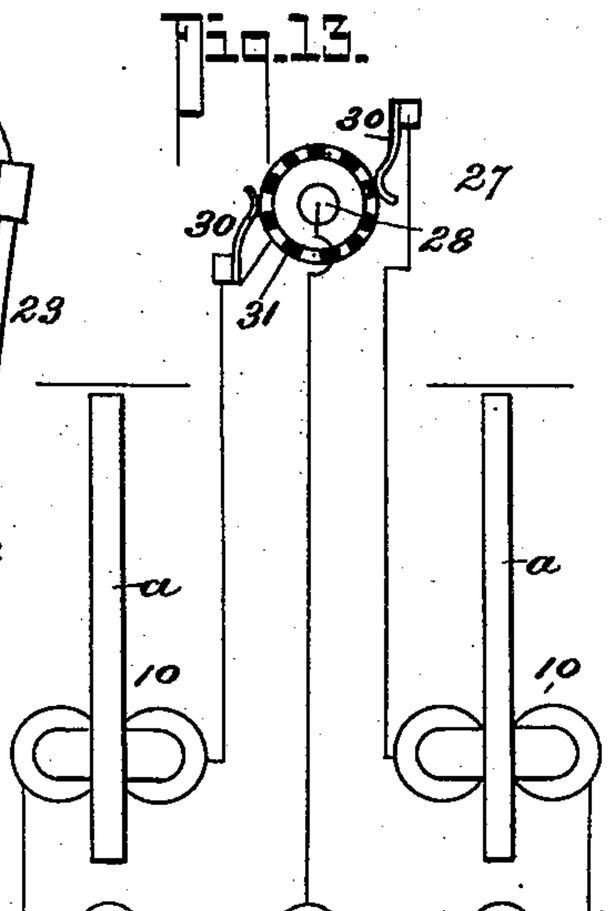



Fig. 7.

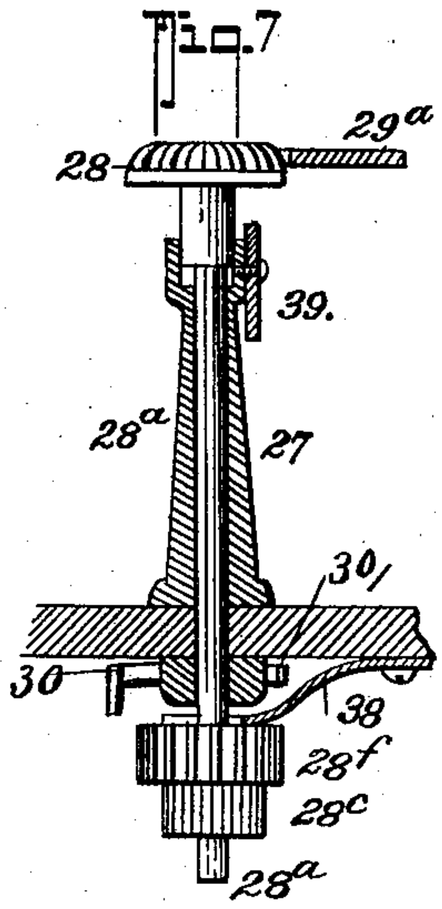



Fig. 11.

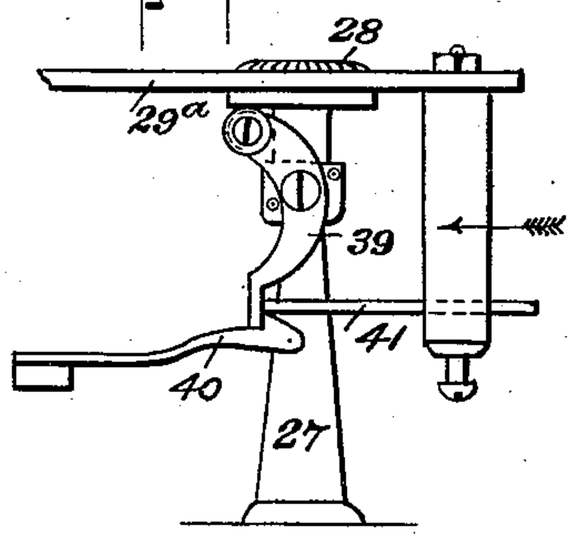



Fig. 11.

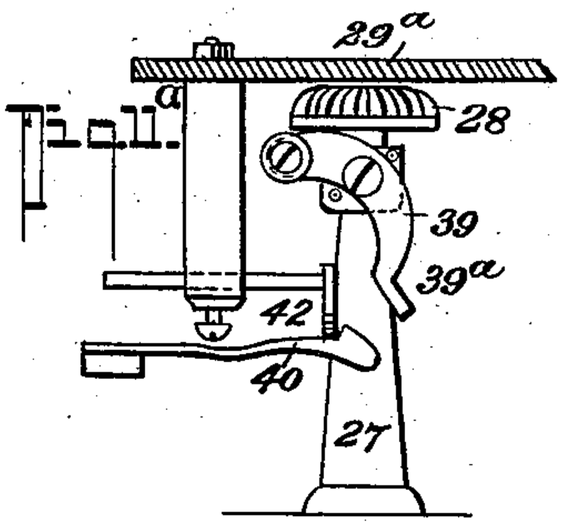
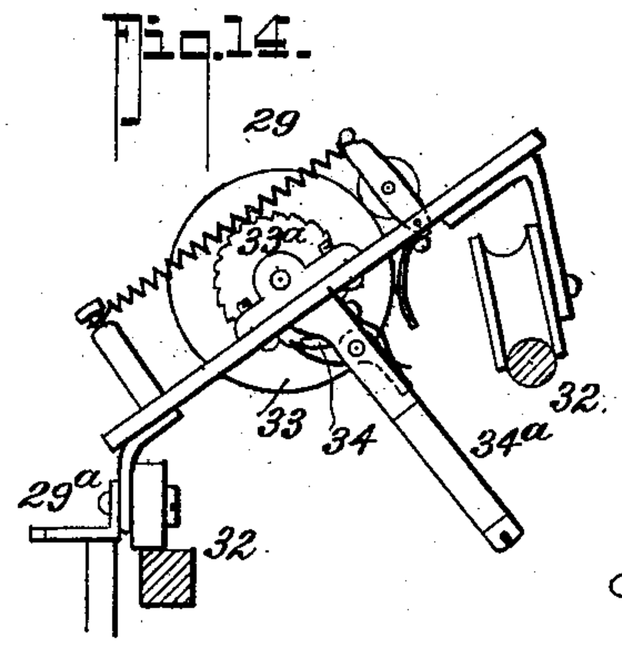



Fig. 14.




WITNESSES:

Louis Dieterich

John E. Burch.

INVENTOR

Oscar L. Kleber

BY

Fred G. Dieterich & Co.

ATTORNEYS

# UNITED STATES PATENT OFFICE.

OSCAR L. KLEBER, OF PITTSBURG, PENNSYLVANIA.

## PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 712,939, dated November 4, 1902.

Application filed September 10, 1900. Serial No. 29,559. (No model.)

*To all whom it may concern:*

Be it known that I, OSCAR L. KLEBER, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Printing-Telegraphs, of which the following is a specification.

My present invention relates to improvements in that character of printing-telegraph mechanisms in which are included a type-wheel having the characters, letters, marks, or other arbitrary indicating means thereon and electrically-controlled devices for setting the wheel to predetermined positions to bring the desired letter, numeral, or other character or sign into a proper place before moving the said wheel to its printing position.

In its more specific nature my present invention relates to improvements on the printing-telegraph mechanism described in my Patents Nos. 571,464 and 575,830, dated March 16, 1895, and January 26, 1897, respectively.

To clearly bring out the essential features of my present invention, I shall first in a general way describe the generic features of my printing-telegraph mechanism particularly as described in my Patent No. 537,464 and point out generically wherein my present invention differentiates therefrom, after which the details of construction of my present improved printing-telegraph mechanism will be fully described, and particularly pointed out in the appended claims.

The construction of my printing-telegraph mechanism shown in my patents aforesaid comprises generally a revoluble shaft adapted to be rotated in one direction by any approved means—for example, a spring-motor, upon which the shaft is mounted, a type-wheel carrying upon its peripheral edge letters, numerals, punctuation-marks, and other characters, symbols, signs, &c., such as are used in the art of printing-telegraph, and a series of what I term "toothed" selecting-disks and spacing-wheels, being also mounted upon the said shaft to rotate therewith, which are severally and in conjunction set into an operative condition by electrically-controlled fingers or detent devices adapted to shift from one disk and wheel to another in such manner that any desired letter, mark, symbol, sign, or other character upon the printing or type wheel agreeing with the transmitted telegraph-signal will be brought to a predetermined point, said mechanism also including in its complete make-up certain electrically-operated means for shifting the type-wheel after set to a predetermined position to print the desired character, supplemental devices set to an operative condition by the movement of the type-wheel carrying or supporting frame being also provided, adapted to shift the electrically-controlled devices that govern the spacing-wheel and selecting-disks to their initial or normal position after each printing action of the type-wheel, whereby to bring the printing mechanism back again into position to be again set by a subsequent telegraphic transmittal of a desired sign or character.

In the practical operation of the mechanism disclosed in my patents aforesaid it is necessary before the operator at the transmitting or sending point can transmit a second or subsequent telegraphic sign or other signal that he wait sufficiently long to permit the the type-wheel and the electrically-controlled devices that set it to its proper position to resume their normal condition.

In the practical use of the mechanism above generally outlined and specifically pointed out in my patents stated I have found that while the receiving of the transmitted telegraphic signals and the printing of the same are accurately and advantageously effected, yet owing to the necessary intervals between the transmittal and printing of each character or sign it is impossible to transmit and print the desired signals with great speed.

My present invention primarily seeks to provide for materially increasing the speed of my patented mechanism aforesaid, and to this end I have provided a duplex mechanism—that is, a double set of type-wheel-setting and print-shifting mechanisms—arranged to be alternately operated and coöperatively electrically connected with a single transmitter in such a manner that immediately after one set of type-wheel rotating and shifting mechanisms have been electrically manipulated from the transmitter end the shifting operation of the said mechanism will instantly break the electrical circuit between the said mechanism last acted on from the transmit-

ter end and simultaneously switch the circuit from the transmitter-line to the next type-wheel setting and shifting mechanism, whereby to place the same in condition to take the next signal from the transmitter end and print same during the time that the first type-wheel setting and shifting devices resume their normal position, it being understood that precisely the same action of switching the transmitter-circuit from the second set of type-wheel-operating mechanism to the first mechanism occurs during the return of the said second mechanism to its normal position, whereby to again set the first type-wheel mechanism into an operative condition.

My present invention, so far as it relates to this particular feature, comprehends in the complete make-up of the aforesaid duplex mechanism a means for shifting the type-wheels successively as they are alternately moved to their printing positon, whereby to bring both type-wheels over a common printing-point on the paper-carriage.

In my present invention I also employ two sets of magnets, one for operating the electrically-controlled fingers that shift from one disk and wheel to another (the same as is effected in the mechanism shown in my patented printing-telegraph mechanism) and a local magnet for shifting the type-wheel carriage or supporting-frame to bring the type-wheel to a printing position, the special arrangement of the two sets of magnets in my present case differentiating, however, from what is shown in my patents aforesaid in that the local magnets are disposed under the base of the machine, and the movement of the armature of the said local magnets in the present case is also utilized for other purposes, that of operating the shifting devices for the paper-carriage mechanism hereinafter fully explained.

I deem it proper at this point to say that any known electrical means may be employed to operate one of the two sets of magnets at will from a distance—for instance, two main lines or by means of the polarized relay mechanism—such, for example, as is referred to in my Patent No. 537,464—or by means of the increased or decreased current.

In my present form of printing-telegraph I utilize two sets of magnets, both of which are arranged to be brought into circuit with the single transmitting-line, and to this end the magnets for shifting the type-wheel devices to the printing devices are energized by means of a local battery-circuit normally held open and automatically set to its closed position, such movement being governed by the action of the armature-lever for the type-wheel-setting devices, the advantages of said construction and the details of operation being hereinafter fully described.

My present invention also contemplates certain improvements in the mechanism for automatically shifting the paper-holding carriage, which is arranged to be operated by direct action of the type-wheel-carrying frame when it (the frame) is shifted to bring the type-wheel to a printing position, and the said improvements in the carriage-shifting mechanism includes means for tripping the paper-carriage drive-pinion from an operative engagement with the paper-carriage feed-rack at predetermined intervals, the tripping devices being operated upon a predetermined rotary action of the type-wheel, which is effected by the transmitter sending a certain character in the same manner as the other characters are transmitted, such arrangement being especially provided for properly setting the paper-carriage for paragraphing.

My present invention in its subordinate features embodies certain novel details of construction and combination of parts, which will hereinafter be fully set out, and particularly pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view illustrating the general arrangement of my improved printing-telegraph mechanism. Fig. 2 is a diagrammatic view illustrating one way of shifting the type-wheels laterally as they, together with their carrying-frame, are swung to a printing position. Fig. $2^a$ is a detail section taken on the line *a a* of Fig. 2. Fig. 3 is a detail front elevation, parts being in section, of one of the type-wheels, the spacing-wheels, selecting-disks, and the finger or pawl devices coöperatively connected therewith. Fig. 4 is a detail view of the several pawls or fingers *x y z* hereinafter specifically referred to. Fig. 5 is an inverted plan view illustrating the means operated by the local-battery armatures for shifting the pinion or drive-gear that feeds the said carriage. Fig. 6 is an end view thereof as viewed from the line indicated by 6 6 of Fig. 5. Fig. 7 is a vertical section of the same on the line 7 7 of Fig. 6. Fig. 8 is a detail section taken practically on the line 8 8 of Fig. 3. Fig. 9 is a diagrammatic view illustrating the means for sounding an alarm when the type-wheel is rotated to a desired position. Figs. 10 and $10^a$ are views illustrating one way of effecting an automatic adjustment of the carriage-feeding pinion to release the carriage at its intermediate points for paragraphing. Figs. 11 and $11^a$ are detail views illustrating a portion of the paper-carriage with the driving-rack and the operating-pinion that engages with the rack and the pinion-tripping devices hereinafter referred to. Fig. 12 is a diagrammatic view illustrating the manner in which the local magnets are coupled with the main line and the circuit-making devices for the local circuit and controlled by action of the magnets 10 for the wheel-setting devices are arranged. Fig. 13 is a diagram illustrating one way of alternately shifting the main-line circuit from one set of type-wheel-setting mechanism to the other. Fig. 14 is an end view of the paper-carriage.

Referring now to the detailed arrangement of my present construction of printing-telegraph, 1 indicates a suitable base comprising a longitudinally-extending portion $1^a$, upon which the paper-carriage mechanism hereinafter described is mounted, and a forwardly-extending portion $1^b$, upon which the magnets, the duplex type-wheels, and their operating mechanisms are mounted.

By referring now more particularly to Fig. 1 of the drawings it will be noticed two type-wheels 6 6 and two independent sets of electrically energized and operated mechanisms, one for each type-wheel, are provided. The two type-wheels and their coacting set of operating devices are constructed and operate alike, and a detailed description of the special construction of parts of one set of said devices will suffice for both. In the upwardly-projecting bracket members 3, made fast to or integral with the base 1, is mounted a rock-shaft 4, which carries a vertical member, the upper end of which terminates in a bifurcated yoke $4^a$, the ends of which form parallelly-arranged side frames $4^b$, that carry the type-wheel, the selecting-wheels and spacing-disks, and the electrically-controlled spacing fingers or detents.

5 designates the horizontally-disposed revoluble shaft held to rotate in the side frames $4^b$, and one end of the said shaft (indicated by $5^a$) is extended, and in practice said shaft (indicated by $2^a$) is extended and in practice coupled with any suitable driving power (not shown) coupled up with the shaft in such manner as to turn it continuously in the same direction.

Upon the shaft 5 is mounted a type-wheel 6, which in the present construction is rotated with the shaft, but also has a limited or sliding movement thereon, the reason for which will presently appear. This wheel 6 has the alphabetical letters, numeral characters, punctuation-marks, and other symbols, signs, &c., such as are usually employed in the ordinary telegraphic codes.

Upon the shaft 5, between the frame portions $4^b$, is mounted a toothed selecting-disk 7, a spacing-wheel 8, and the cam-wheel for shifting the fingers $x$ $y$ laterally to their return or normal position and all of which, except in some minor details hereinafter explained, are constructed and operate substantially like that shown and described in my patents hereinbefore referred to.

The detent or stop-finger $z$, that engages the stop-lug 9 on the cam-wheel $9^a$, has its detent portion curved in such manner as to be engaged by the trip member $10^a$ on the armature-lever $a$, which lever is operated by electric impulse sent through the magnets 10, and this lever or bar is fulcrumed upon a shaft 11, which has adjustable end bearings in the upwardly-projecting standards 12 of the main supporting-frame, and the said lever or bar operates between the ordinary form of screw adjusting-stops 13, and it is returned to its normal position by means of the usual type of retractile spring 14, as shown.

In the present construction the finger $x$, that engages the selecting-disks, is also arranged to automatically assume its normal or disengaging position immediately after it has been tripped by the down movement of the lever armature-bar $a$. In my present case, however, the finger $x$ is provided with a spring-held latch $x'$, with which the member $10^a$ of the bar $a$ engages upon the down thrust (see Fig. 8) and over which the said end $10^a$ slips immediately after the said finger $x$ has been moved to release the selecting-disks, whereby to allow the said finger $x$ to again engage the disks, so its side lip $x^b$ will properly engage the selecting-disks to cause a proper shifting of the two fingers $x$ $y$, which action in this case is effected the same as is done in my patented mechanisms hereinbefore specified.

In my present construction I also employ a means for holding the fingers $x$ $y$ to a released position during the return of the type-wheel and its supporting-frame to the normal position, and the said means consists of a short rock-shaft 15, disposed parallel with the shaft X, carrying the fingers $x$ $y$, and mounted in the bearing 16 on the upper end of an arm $16^a$ on an upright $16^b$, (see Fig. 3,) that extends up from the base $1^b$.

One end of the shaft 15 lies adjacent the inner face of the type-wheel 6, and the said end carries a ratchet-collar $15^a$, with which a pawl 17 engages, which pawl is made fast to the yoke-frame $4^b$ and so arranged that when the said frame, together with the mechanism supported thereon, is swung toward the paper-carriage in the manner presently described it will rock the shaft 15 in such direction as to bring its projecting blade $15^b$ to a horizontal position, said blade $15^b$ being so disposed relatively to the pendent ends of the fingers $x$ $y$ that when turned to its horizontal position in the manner hereinafter described it will engage with and move the said pendent ends of the fingers $x$ $y$ in such direction as to free their upper ends from engagement with the selecting-disks and spacing-wheels, and thereby allow the revoluble shaft 5, together with the parts supported thereon, to turn to their normal position, such direction of movement being, however, limited by the stop-lug 9 coming into engagement with the ratchet or finger $z$.

The shaft 15 has a rearwardly-projecting finger $15^c$, which lies in the plane of movement of the lug $15^d$ upon the inner face of the type-wheel and which is so timed in its movement as to engage the finger $15^c$ to rock the shaft 15 and move its blade to a vertical position—that is, released from engagement with the fingers $x$ $y$ just before the wheel and the parts carried thereby reach the limit of their return movement to their normal position.

The local-battery coils $18^a$ in this case are under the base portion $1^b$ and are arranged

in a horizontal plane, and the armature-bar of the said coils (indicated by 18) is made fast to the lower end $4^c$ of the rock-frame 4.

It will be apparent by reference to Figs. 1 and 5 of the drawings that when the magnet $18^a$ is properly energized the armature as it is sucked causes the frame $4^a$ to rock upon its bearings and bring the type-wheel to a printing position, such swinging action of the frame being effected at predetermined times and in the manner presently fuliy set forth.

The circuit-interrupting devices, hereinbefore referred to, consist of a pivoted switch-finger 19, pressed to its contact-making position by a spring $19^a$, which causes it to engage a stud-pin 20, that forms one terminal of the lead $20^a$ of the magnet $18^a$.

The finger 19 is normally held to its circuit-interrupting position—that is, away from the stud-pin 20—by a rod 21, having a finger $21^a$, that engages the member 19, as clearly shown in Fig. 1, said rod 21 being extended rearwardly and made fast to the rock-shaft 22, journaled in the brackets 3 3 parallel with and adjacent the rock-shaft on the frame $4^a$, the shaft 22 also having an upwardly-extending arm 23, held to engage the frame $4^a$.

The operation of the circuit-interrupting devices is best explained as follows: The parts being in their normal position and an electric impulse is sent into the magnet 10 to bring the type-wheel into a desired position, the down movement of the bar *a*, by reason of its pendent member $a^{10}$, that engages the switch-finger 19, will move the said finger 19 back against the tension of its spring sufficient to cause the detent or rod 21 to drop down from engagement therewith. This allows the spring force upon the finger 19 to move the said finger over and into contact with the pin 20, and thereby closes the local circuit to the magnet $18^a$; but as the movement of the armature-bar *a* during the sending of the letter, character, or other code-signal is very rapid the contact made by the finger 19 with the stud 20 would not be sufficiently long to permit a proper energizing of the magnet $18^a$ to effect the printing operation. Now assuming the character "H" as having been transmitted and the wheel 6 properly set into a position to print the proper character "H" and the contacts 19 20, by reason of the member 21 being now tripped, being now closed, the local-battery circuit is set into operation, and in consequence an electric impulse is sent through the magnets $18^a$, which sucks up the armature-bar 18 and swings frame $4^a$, together with the type-wheel and other coacting parts mounted therein, to a printing position. This latter movement causes the frame to engage the rod 23 on the rock-shaft 22 to lift the detent or rod 21 into a position to again engage the switch-finger 19 and hold it to an open position to interrupt the current to the magnet $18^a$ until after the magnet 10 has been again energized, as before stated.

The local magnets $18^a$, which when energized operate to shift the type-wheel and its constituent operating parts, in practice may be operated by any suitable current-transmitting means, either a polarized relay, as shown in my Patent No. 527,170, when the several magnets $18^a$ 10 are to be operated by a current of electricity transmitted along a single main line, or by a separate main line, or by means of an increased or decreased current along a single line.

In my present invention the line to the magnets $18^a$ is normally held broken, and in consequence no printing action can be effected until after the type-wheel has first been set to the position desired, the circuit-controlling devices referred to being of such character that during the quick or rapid impulses of the magnet 10 and its bar *a* in the act of sending signs or characters the closing contact made by the circuit-controlling devices will not permit sufficient current being sent into the magnets $18^a$ to shift the frame $4^a$ to its printing position. In other words, the construction of the said controlling devices is such that it will be impossible to effect a printing action until after each predetermined rotation of the type-wheel has been effected.

So far as described the general operation of my present printing-telegraph is explained as follows: In receiving, say, the letter "H" in Morse characters the same is produced by four short impulses or dots. The first impulse or dot effects a quick down movement of the armature *a*, which in its movement releases the fingers *x*, *y*, and *z* and permits the selecting-disks and the spacing-wheels to turn and carry with them the wheel 6 to a predetermined distance—that is, until the disks and wheels are arrested in their movement by the fingers *x y*. A second, third, and fourth impulse causes the said disks and wheel, with the type-wheel 6, to intermittently rotate certain distances, which distances are governed by the differential lateral movements of the fingers *x y*, in turn effected by the movement of the spacing-wheels and selecting-disks. This brings the wheel, with the letter "H," into proper position to engage the paper to which the letter is to be transmitted by printing. Now as the current-controller before referred to in the lead to the magnets $18^a$ has been adjusted in the manner before made clear an impulse is then sent into the magnets $18^a$, which moves the frame $4^a$, with the type-wheel 6 and the selecting-disks and spacing-wheel, to bring the wheel 6 against the paper, it being understood a suitable inking-roll (indicated by S) engages the wheel 6. The printing action of the frame $4^a$ sets in position the proper devices, which upon the return movement of the frame 4 with the wheel 6 again adjusts the fingers *x y* to allow the wheel 6, together with the selecting-disks and the toothed disks, to automatically resume their normal position.

The above operation of the several parts noted is substantially the same as the like parts in my other patents referred to, and a further description of the detailed operation of the selecting and spacing devices and the finger tripping means, &c., is deemed unnecessary.

Now comes the essential features of my present invention: first, the coaction of the two type-wheels with a single paper-carriage and with two sets of selecting and spacing devices, and, secondly, the paper-carriage-feeding mechanism and the intermediate devices operated by the movement of the armature-lever controlled by electric impulse through the magnets 18ª.

In my present improved construction of printing-telegraph the two type-wheels 6 6 and their constituent set of operating devices are mounted one upon each side of the central or printing line of the machine, and each type-wheel is so mounted upon its shaft and adapted when the frame that supports it is swung over to a printing position to be shifted laterally outward in a longitudinal plane with the printing-line, so as to bring the wheel into proper alinement with the paper-printing point prior to its engagement or impact with the paper. This latter shifting operation of the wheel 6 may be effected in various ways after the wheel has been turned to a predetermined position; but I prefer to employ means operated by the first part of the movement of the frame 4ª as it (the frame 4ª) is turned forward to a printing position, and to this end I have shown one form of mechanism that will accomplish such result; but I desire it understood I do not limit myself to such construction, as any equivalent means may be substituted therefor.

In the drawings, Figs. 2 2ª, I have shown the type-wheels 6 6 each formed with an inwardly-beveled rim 25, adapted to engage with the beveled heel-piece 24 on the fixedly-held upwardly-extending post 24ᵇ.

In practice the swing or impact movement of the wheel 6 is limited, and the two opposing beveled faces 25ª 24ª have such angles and a correlation that when the wheel is turned toward the paper-carriage, as indicated by the arrow in Fig. 2, the said wheel will be simultaneously shifted outward upon the shaft in the direction of the arrow 10 to the limit before it (the wheel) reaches the paper, thereby providing for the wheel 6 engaging the paper-carriage in a direct right angle and not with a sliding action, which would occur did not the wheel reach its outermost position upon its shaft prior to its impact with the paper. Any suitable means may be used to return the wheel 6 to its normal position upon its shaft as the frame 4 resumes its normal position. For example, a spring 26, held within the hub of the wheel, as shown, may be utilized for such purpose.

As before stated, the two type-wheels 6 6 and their coöperating devices are adapted to work alternately. This is best made clear by stating that in my patented printing-telegraph during the transmittal of a word—say "hat"—the wheel 6 is first set to bring the letter "h" into line, after which the said wheel, with the said letter properly set, is moved in a printing-position. Now before the operator can send an impulse into the magnets 10 to begin to set the wheel 6 for the letter "a" he must wait until the wheel 6, together with the spacing-wheels, selecting-disks, and operating-fingers, assumes their normal position. This method of operation takes too much time, and to materially cut down this loss of time and correspondingly increase the speed efficiency of my printing-telegraph I have provided the two sets of wheels 6 and their coöperating devices and have arranged them so that while one wheel 6—say the one that printed the letter "h"—is returning to its normal position the other wheel 6 is being set by impulse transmitted for the letter "a," and while the wheel printing "a" returns to its normal position the other or first wheel 6 is again taking up the impulses transmitted for the letter "t." This alternate operation of the two wheels 6 I accomplish by shifting the circuit automatically from one set of wheel-operating magnets 10 to the other set of magnets 10. Any switch mechanism capable of being governed by the swing movement of the frame 4ª toward its printing position may be provided for such purpose; but I prefer to employ means like that shown in Figs. 7, 11, and 11ª, by reference to which it will be noticed that in line with the printing-point of the paper-carriage a post 27 projects up from the base, in which is journaled a shank 28ª, that carries a pinion 28, which transmits a step-by-step motion to the paper-carriage, said pinion being arranged to move into mesh with the feed-rack 29ª of the carriage 29, presently more fully described. This pinion 28 at each forward swing of the frame 4ª is turned one step or tooth to feed the paper-carriage laterally, so that a proper alinement of the record is produced, this step-by-step movement being accomplished by an improved means, presently described.

Mounted upon the post that supports the pinion 28 is a pair of contact-brushes 30, with which the leads to the magnets 10 10 for each type-wheel mechanism connect, and upon the shaft 28 of the pinion is held a make-and-break disk 31, which alternately makes circuit with the brushes, first with one for one set of magnets 10 and then to the other set of magnets 10. Thus should the letter—say "h"—have been transmitted through the several impulses sent through magnets 10 at the right of Fig. 1, the circuit to magnets 10 at the left being at this time broken, the impulse through the magnets 18ª at the right, to cause the frame 4ª at that side to swing forward, will operate to turn the pinion 28 one tooth or space and at the same time cause

its make-and-break disk to shift so as to cut out the magnets 10 at the right and bring into circuit with the transmission-line the magnets 10 at the left. Hence the operator immediately after sending the impulse into the magnets 18ª at the right can proceed without delay to send in the next letter—say "a"—the impulse for producing such letter now passing into the magnets 10 at the left, and as this operation can be alternately repeated at the will of the operator it is manifest practically no time is lost in transmitting, and hence the speed of the mechanism is brought up to the maximum point.

The carriage 29 in the construction shown is arranged to travel in a substantial horizontal plane, and the same comprises a rectangular frame mounted upon trackways 32 32, disposed parallel with the type-wheel shafts, the said trackways being, however, in different horizontal planes to bring the platen or roll 33 into a proper position to receive the imprint of the wheel 6.

Any suitable means may be provided for feeding the paper-platen to bring the paper in position at the end of each line. For example, one end of the platen 33 may have a ratchet-gear 33ª, with which engages a pawl 34, said pawl having a pendent arm 34ª, adapted, when the carriage is turned back, (which operation is automatically effected by counter spring or weight devices 35, as shown,) to engage a guide-frame 36, projected in such manner from the main frame as to cause the pawl 34 to swing in the direction indicated by the arrows in Fig. 1, whereby to cause the said pawl 34 to turn the platen, a second arm 37 being also provided, which is arranged to engage the armature 34ª as the carriage is being drawn forward and has for its purpose to bring the said arm 34 into position to again engage with the arm 36 when the carriage is brought back.

The lower or front edge of the carriage-frame 29 carries a feed-rack, which engages with the pinion 28. In operation the pinion as it is rotated step by step moves the carriage forward space by space.

I shall now explain the manner in which the pinion 28 is turned to effect the step-by-step motion of the carriage and shall also describe the means for turning the said pinion out of gear with the carriage-rack, particularly for paragraphing purposes. The shaft 28ª, that carries the pinion 28, has a vertical movement in its standard, and the said shaft is held at its lower or depressed position, with the pinion in a plane below and out of mesh with the carriage-rack, a spring 38 (see Fig. 7) being used for such purpose, and the said shaft 28ª, with its pinion 28, is moved to its elevated or carriage-rack-engaging position by a latch 39, pivoted upon the standard and having a pendent heel 39ª, which engages a spring-latch 40, which tends to hold the latch 39 in one direction of movement—namely, to its pinion-lifted position. The heel member 39ª of the latch 39 when the pinion 28 and its shaft are at their lowermost position lies in the path of the trip-finger 41, mounted upon the carriage and so arranged that when the carriage is turned back to the beginning of its line movement it will engage the said heel 39ª (see Fig. 11) and move the latch 39 into position to elevate the pinion 28 and put it into mesh with the carriage-rack, a second trip member 42, secured to the carriage, being also provided, which operates on the limit of the movement of the carriage in an opposite direction to trip the latch 39ª (see Fig. 11ª) and release the pinion 28 from its rack-engaging position, and as the said pinion 28 is spring-held to its depressed position it is manifest that it will be held down out of engagement with the carriage-rack until the said carriage-rack moves back to its place of beginning, when its tripper-arm 41 will engage the latch 39 and again move the pinion into an operative position.

In Figs. 5 and 6 the mechanism for shifting the carriage-operating pinion 28 to produce a proper spacing action of the paper-platen is shown in detail, and by reference to the said figures it will be observed the armature-bar to the magnets 18ª at the left side carries a pawl 45, spring-held in engagement with the ratchet-disk 28ᶜ upon the lower end of the shaft 28ª, the correlation of the pawl 45, the movement of the armature-bar and the ratchet 28ᶜ being such that each movement of the armature-bar toward its magnets will effect a rotary action upon the ratchet 28ᶜ and the shaft 28ª to the degree of one tooth, back movement of the shaft 28ª and the ratchet 28ᶜ being prevented by a check-pawl 46. A similar pawl 47, carried upon the armature-bar of the other magnets 18ª, engages a ratchet 28ᵈ, having a gear 28ᵉ, held to mesh with a cog-gear 28ᶠ, connected to the ratchet 28ᶜ, and the two pawls 45 and 47 so engage the ratchets 28ᶜ 28ᵈ as to perfect the rotary action thereof in the same direction as they (the pawls 45 and 47) alternately act thereon. It will thus be understood that in my present construction of telegraphing mechanism the paper-carriage feed is effected by a direct action upon the shaft 28ª, transmitted from the armature-bars of the magnets 18ª when the said magnets are energized.

To provide for paragraphing, each type-wheel 6 has a separate blank space upon its peripheral edge, and in harmony with such blank space it has a laterally-projecting lug 60. This lug 60 when the wheel is turned to a predetermined position to bring the blank space aforesaid in line with the printing-point of the paper-carriage and when the wheel is swung forward to a printing position to engage with the shifting-lever mechanism (see Figs. 10, 10ª) and indicated by 50 consists of a rod 50ª, a crank-shaft 50ᵇ, journaled in bearings 50ᶜ and having fingers held to straddle the wheel 6 and to be engaged by the lug 60 therein. The rod 50ª connects at the

upper end with the crank member $50^d$ and at the lower end with the latch member 40, and the several parts of the mechanism 50 are so arranged and adapted to operate in such manner that the heel $39^a$ of the latch 39 will be tripped, and thereby allow the gear 28 to automatically free itself from the carriage-rack and in consequence thereof allow the carriage to return to its line of starting-point, it being understood that as the carriage moves in such direction the paper roll or platen will automatically be rotated to effect a proper line-spacing.

My invention is especially adapted as a "stock-ticker." In stock-exchanges it is frequently desirable to notify those present that important news is about to be known in advance of printing the same. For this purpose I also provide the type-wheels each with a blank peripheral space and a separate lateral lug 65, adapted when the wheel is properly shifted and moved to its printing position to make contact with the local-battery circuit and ring an alarm in the said circuit, as will be clearly understood by reference to the diagrammatic view Fig. 9.

When using separate lines for operating the printing-frame and the selecting-disks and spacing-wheels, the local-circuit-breaking device, hereinbefore described, is omitted, and when this latter means for operating the parts just referred to is used the arm $15^c$ is made sufficiently flexible to permit the printing-wheel when set in such manner that the tripping-lug $15^d$ engages the said arm to pass over the said arm without affecting the position of the printing-wheel.

No time for spacing is lost in the use of my present invention, as the entire printing-wheel and selecting and spacing devices are swung forward, and by reason of such movement the carriage is automatically fed at each swinging motion of the said devices.

To space between words, the wheels 6 are adjusted to bring the line and space blank on their peripheral edges, and the frames $4^a$, supporting the said wheels, are swung over the same, as in printing a letter or other character.

While I have illustrated my special form of carriage feed and shifting devices in this application, said devices form no part of my present invention, as they are fully disclosed and claimed in my Patent No. 683,051, dated September 24, 1901.

While I have throughout the foregoing description referred to the magnet $18^a$ as a "local" magnet to differentiate it from the magnet 10, I desire it understood that the same need not necessarily be operated by a local battery, as the electrical impulses therefor may be transmitted thereto by any suitable means, such as polarized magnets or polarized relay or by an additional main line.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a printing telegraphic system of the character described, a pair of type-wheel-setting mechanisms, each mechanism being held for independent operation; an impression-surface; an electromechanical means for alternately moving the type-wheel mechanisms to a printing position said means including devices for bringing the alternately-moved type-wheels onto the same printing-point on the impression-pad, for the purposes stated.

2. In a telegraphic system, the combination of the following elements; a pair of type-wheel-setting mechanisms, each held to operate independently of the other; electromechanical means for setting the wheel of one setting mechanism and moving it to a printing position as the wheel and the setting devices of the other wheel-governing mechanism return to the normal or initial position, as set forth.

3. A printing-telegraph comprising two type-wheels each independently operable, and electromechanical means for each type-wheel adapted when impulses are sent therethrough to set the type-wheel to a predetermined position, electromechanical devices for shifting each wheel when it is set to its printing position, a circuit-switching means controlled by the movement of the type-wheel carrier or frame when it is swung to its printing position to cut out the main line from the wheel thus shifted and bring it into circuit with the opposite wheel-operating devices for the purposes specified.

4. A printing-telegraph mechanism comprising a type-wheel, means for setting the said wheel to predetermined positions, said means including an electromagnet and tripping devices automatically set to one position and released by the shifting of electrical impulse through the aforesaid electromagnet; a second electromagnet-controlling means for shifting the type-wheel to its printing position, a paper-platen, a carriage therefor, said carriage having an automatic return movement, a feeding mechanism for moving the carriage forward step by step, operated by the movement of the wheel-setting devices when the said devices are swung to their printing position as set forth.

5. In a printing-telegraph of the character described, the combination of the following elements; a type-wheel, electromechanical means for setting the same to a predetermined position and for moving it to engage the paper-platen after it, the wheel, has been set, a feed mechanism for moving the paper-platen carriage step by step, said feed mechanism being connected with and operated by the movement of the type-wheel-supporting frame as it, the frame, swings to a printing position, and a trip mechanism for releasing the carriage-feed mechanism operated by the printing thrust of the type-wheel and its frame after the said wheel has been set to a predetermined position as specified.

6. In a telegraph mechanism of the character described, the combination with the reciprocating paper-carriage having automatic means for returning it to its place of beginning, and a feed mechanism adapted to move the carriage forward step by step, a type-wheel, electromechanical devices adapted, when energized, to set the wheel to a predetermined position, and a second set of electromechanical devices governed by the movement of the first set of electromechanical devices for shifting the wheel to a printing position after it has been set, a trip mechanism for throwing the carriage-feed devices out of gear, and a member upon the type-wheel adapted to engage with the said trip mechanism when the type-wheel is set to a predetermined point and shifted to its printing position to release the carriage-feed mechanism, substantially as shown and described.

7. In a printing-telegraph of the character described, the combination with the revoluble type-wheel, mechanism for setting the same to a predetermined position and electromechanical devices for adjusting the said wheel-setting mechanism when said devices receive an electrical impulse, a second set of electromechanical devices having independent energy or battery-power adapted, when energized, to swing the type-wheel to its printing position, a switch in the local circuit, a trip member adapted to engage the said switch and hold it open, and means controlled by the electromagnets that operate the wheel-setting devices for moving the said tripper to a released position, whereby to permit the said switch to close, all being arranged substantially as shown and for the purposes described.

8. In a printing-telegraph mechanism of the character described; the combination of a pair of independently-held type-wheels, a printing-surface common to both wheels, electromechanical devices operated from a single main line for first rotating either wheel to a predetermined position and then shifting the set wheel to a printing position, said electromechanical means including a local-battery circuit for each type-wheel normally held open or inoperative, a switch mechanism in each local circuit moved to a circuit-closing position by electric impulse from the main line, said local circuit operating to effect the swinging or printing action of the wheel, said switch being constructed to automatically move to an open position by the movement of its coöperating type-wheel back to its normal position, and a separate switch mechanism governed by the printing movement or swing of the type-wheel to cut out the main line from the wheel-operating mechanism at one side and shift the said main line into circuit with the type-wheel and its coöperating devices at the other side, as specified.

9. In a printing-telegraph mechanism of the character described; a plurality of independently-operating type-wheels; a separate set of electromechanical mechanisms for each type-wheel for setting and shifting the same into a printing position, a single main or electric impulse-transmitting line in circuit with the different sets of wheel-operating devices, and a switch mechanism for shunting the main line into a second set of switch devices after the first set of devices have received an electrical impulse and simultaneously cutting out the first set of devices from the main line as set forth.

OSCAR L. KLEBER.

Witnesses:
T. E. McCAUSLAND,
D. J. CABLE.