

(No Model.)

3 Sheets—Sheet 1.

R. J. SHEEHY.
PRINTING TELEGRAPH.

No. 307,232.

Patented Oct. 28, 1884.

Fig. 1.

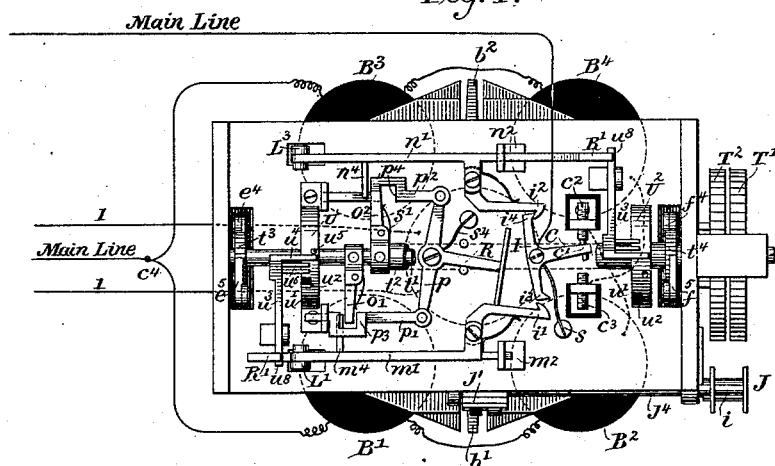
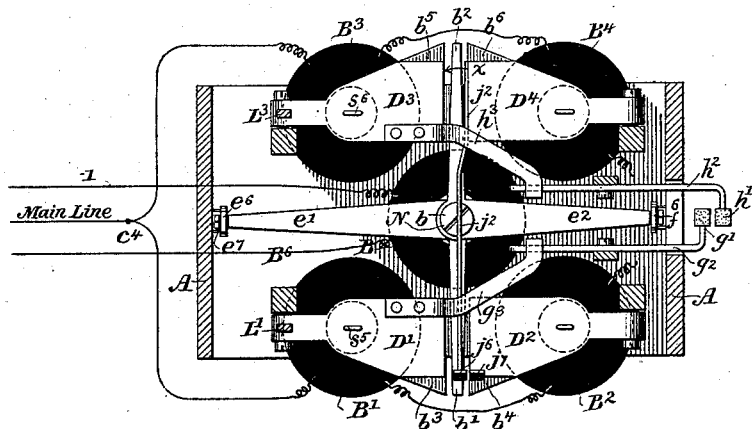


Fig. 2.



WITNESSES

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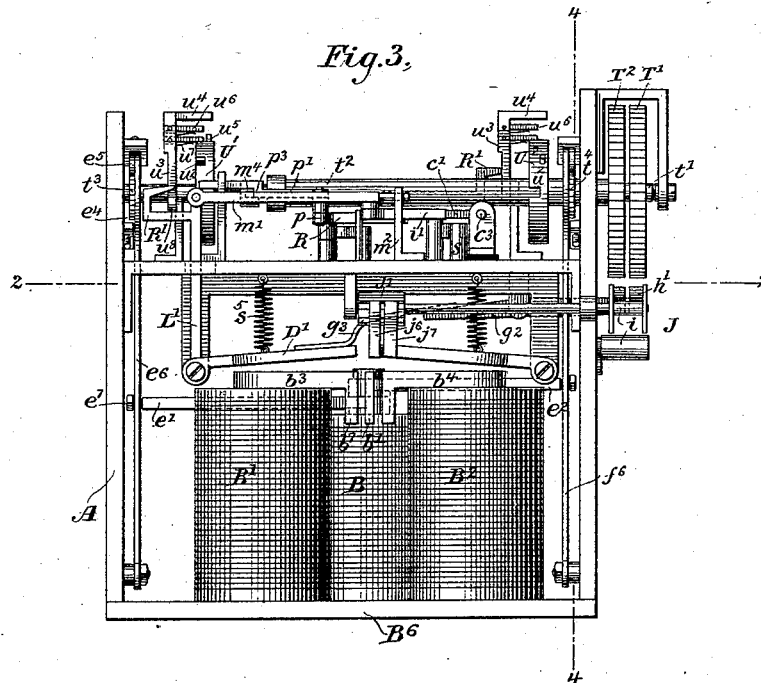
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3 Sheets—Sheet 2.

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PRINTING TELEGRAPH.

No. 307,232.

Patented Oct. 28, 1884.



UNITED STATES PATENT OFFICE.

ROBERT J. SHEEHY, OF NEW YORK, N. Y.

PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 307,232, dated October 28, 1884.

Application filed November 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, ROBERT J. SHEEHY, a citizen of the United States, residing in New York, in the county and State of New York, have invented certain new and useful Improvements in Printing-Telegraphs, of which the following is a specification.

My invention relates to certain improvements in devices and apparatus for revolving either or both of the two type-wheels of a printing-telegraph receiving-instrument through the agency of electric impulses transmitted thereto, for automatically effecting impressions from one or the other of those type-wheels, as desired, and for maintaining both type-wheels in unison with the transmitting-instrument.

The object of the invention is to simplify the construction of such an instrument, to actuate it by means of electric currents transmitted over a single main line, and to render it more responsive to the variations in the character and duration of the currents transmitted thereto.

The invention consists in organizing the apparatus in substantially the following manner: The two type-wheels are constructed to be revolved through the agency of electric impulses of alternating polarity by means of an armature which is of peculiar construction. This armature is polarized by induction, and responds to reversals in the polarity of the currents transmitted upon the main line. Two independent armatures applied to two different electro-magnets are respectively employed for effecting impressions from the two type-wheels. These armatures are actuated by means of electric impulses of greater duration than those required for actuating the type-wheels. When either of the type-wheels has been advanced until the required character is above the paper tape, a prolongation of the impulse last transmitted will effect an impression of that character. When it is desired to print from the other of the two type-wheels, that last employed is brought to rest in such position that an arm, moving with the same, is caused to stand in the path of a detent moving with the particular armature employed for effecting impressions from that type-wheel. If that armature be then actuated, the circuit-connections will be changed

from the electro-magnet employed for actuating that particular type-wheel to the other electro-magnet, and the subsequent succession of alternating impulses will cause the second type-wheel to be revolved. Each of the electro-magnets is further provided with an independent armature for advancing the paper tape upon which the impressions are made. These armatures respectively respond to impulses of the character required for effecting impressions from the corresponding type-wheels. The unison of each of the type-wheels with the transmitting-instrument is effected by means of an open drum or cylinder-head, moving with the corresponding type-wheel, and a detent, which is caused to intercept the path of a stop carried upon said drum whenever it is desired to arrest the type-wheel. This detent is normally held out of the path of the stop by means of one or more fingers resting upon the periphery of the drum. At each revolution of the drum one of these fingers is allowed to fall through a slot formed in the periphery of the drum, thus permitting the detent to approach the periphery of the drum. After the requisite number of revolutions the detent will rest upon the drum, in which position it will arrest the movement of the same by intercepting the path of the stop. I prefer to employ two or more of the fingers, so that it will require more than two revolutions of the drum to bring the detent into the path of the stop upon the periphery of the drum. Such a device as described is applied to each type-wheel. For the purpose of preventing either type-wheel from being arrested in this manner during the process of printing from that wheel an arm moving with the particular armature employed for actuating the corresponding platen is employed for raising the detent from the periphery of the drum each time an impression is made and the paper tape advanced. Such an upward movement of the arm carrying the detent and fingers is rendered possible by pivoting the fingers so that when forced upward they will, upon striking against the inner surface of the drum, be allowed to turn upon their axes in opposition to the action of springs applied thereto, and thus be brought upon the outside of the drum. When, however, a sufficient number

of impressions are transmitted to the instrument without the intervention of a prolonged current, the detent will be brought into the proper position for arresting the type-wheel.

5 The friction between the supporting parts of the two type-wheels is preferably sufficient to cause each to be advanced by the movements of the other until it is arrested by the corresponding unison device.

10 In the accompanying drawings, which illustrate my invention, Figure 1 is a plan view of the complete instrument, and Fig. 2 is a plan view of the same through the plane 2 2, Fig. 3. Fig. 1^a is an enlarged plan view showing more
15 clearly the parts represented in Fig. 1. Fig. 3 is a side elevation of the instrument, and Fig. 4 is a front elevation through the plane 4 4 of Fig. 3. Fig. 4^a is an enlarged view, illustrating the unison device and type-wheel-
20 actuating mechanism.

Referring to these figures, A represents the frame-work for supporting the various parts of the instrument, and B, B' B², and B³ B⁴ represent three electro-magnets, each of which is
25 supported within this frame, and provided with a back plate, B⁶, of soft iron, common to all. The coils of the electro-magnet B are included in the circuit of a conductor, 1, which preferably constitutes a local circuit. This
30 electro-magnet is designed to be vitalized continuously by means of a current of electricity transmitted through the conductor 1 whenever the instrument is in use. The magnetism induced in the electro-magnet B is availed of for
35 the purpose of polarizing two armatures, b' b², which are respectively applied to the electro-magnet B' B² and electro-magnet B³ B⁴. These armatures are designed to respond to electric impulses of alternating polarity transmitted
40 through the coils of their respective electro-magnets, and to be actuated in one direction by currents of a given polarity and in the opposite direction by currents of the opposite polarity. For this purpose the electro-magnet B' B² is wound in the usual manner, so that
45 the poles b³ and b⁴ will be of opposite polarity. The poles b⁵ and b⁶ of the electro-magnet B³ B⁴ are in like manner rendered of opposite polarity. If thus the magnetism induced in the armature b' by means of the electro-magnet B is of north polarity, the armature
50 will be both impelled and attracted in the direction indicated by the arrow *a*, Fig. 2, when the magnetism manifested at the pole b³ is of north polarity and that at the pole b⁴ of south polarity, and vice versa. A like result will be effected with reference to the armature b² when the electro-magnet B³ B⁴ is vitalized.

60 For the purpose of rendering the action more certain I prefer to construct the poles of the electro-magnets B' B² and B³ B⁴ with extensions b' b², Fig. 3, which extend into proximity to the respective armatures b' and b² and
65 upon opposite sides of the same. The movements of the armature b' or b² thus occasioned

are employed in a manner, hereinafter described, to advance one or the other of two type-wheels, T' or T².

For the purpose of determining which of
70 the armatures b' or b² shall be thus actuated it is necessary to employ means for directing the current from the main line through one or the other of the two electro-magnets B' B² or B³ B⁴. This is accomplished by means of a circuit-controlling device, C, which consists of an arm,
75 c', moving between two contact-points, c² and c³, which contact-points are respectively connected with conductors leading through the one or the other of the electro-magnets and uniting at a point, c⁴. The contact of the arm
80 c' with one or the other of these contact-points is secured in a manner hereinafter described. The arm itself is connected with the main-line conductor, and the point c⁴ is connected with
85 the earth either directly or through the succeeding instruments of a series. Each of the armatures b' b² is carried upon a suitable post or standard, b, extending from or constituting a continuation of the core of the electro-magnet B. From this electro-magnet the armatures receive a polarization corresponding to that of the core of the electro-magnet. Thus, if the pole N of the electro-magnet B is of south polarity, the armatures b' and b² will
90 also be of south polarity. Secured to each armature is a right-angled extension, c' and c², respectively. These extensions or arms are respectively designed to actuate the two type-wheels T' or T² in correspondence with
95 the movements of the corresponding armature, b' or b². For this purpose the type-wheels are respectively mounted upon a shaft, t', and a sleeve, t², encircling the shaft. The shaft or
100 arbor t' is supported in the frame A in any suitable manner, and it carries near one extremity a ratchet-wheel, t³, which is designed to be actuated by means of two pawls, e⁴ and e⁵. These pawls are carried upon a pivoted
105 arm, e⁶, and they engage the opposite sides of the ratchet-wheel t³. The movements of the arm or lever e⁶ are occasioned by the action of the armature b' and arm e' by means of the connecting-joint e'. The to-and-fro movements of the lever e⁶ cause the pawls e⁴ and e⁵
110 to alternately engage the teeth of the ratchet-wheel and advance it step by step. This movement causes the ratchet-wheel to be revolved and the type-wheel T' to be advanced correspondingly. A ratchet-wheel, t⁴, upon the
115 sleeve t² is caused to advance under the influence of the armature b² by means of pawls f⁴ and f⁵ and a lever, f⁶, in precisely the same manner as described with reference to the ratchet-wheel t³. The movement of this sleeve
120 causes the type-wheel T² to be advanced step by step in response to electric impulses transmitted through the corresponding system of electro-magnets.

When it is desired to effect an impression
130 from the type-wheel which has been revolved until the desired type is above the platen g' or

5 h' , the impulse last transmitted is prolonged. Such a prolongation induces in the core of the corresponding electro-magnet, $B' B^1$, for example, sufficient magnetism to overcome the re-
 tractile force applied to two corresponding ar-
 10 matures, $D' D^2$, which are respectively applied to the two poles of the electro-magnet. The first of these armatures, D' , is employed for causing the platen g' to be impelled in the di-
 15 rection of the type-wheel T^2 through the agency of a pivoted lever, g^2 , upon which it is carried, and an arm, g^1 , extending from the arma-
 ture above one extremity of the lever. A similar arm, h^1 , and lever h^2 are employed for
 20 actuating the platen h' of the type-wheel T' when an armature, D^2 , which corresponds to the armature D' , is actuated by means of one pole of the electro-magnet $B^2 B^1$. The arma-
 ture D^2 and a corresponding armature, D^1 , re-
 spectively, applied to the remaining poles of
 25 electro-magnets $B' B^2$ and $B^2 B^1$ are each employed for actuating a paper-feeding device, J , when the corresponding armature D' or D^2 has been employed for effecting an impression
 30 from the corresponding type-wheel. This is accomplished in the case of the armature D^1 by means of an arm, j^2 , extending into prox-
 imity to a ratchet-wheel, j' , carried upon an arbor, j^1 , of the paper-feeding or friction
 35 wheels $i i$ of the device J . A pawl, j^6 , which is carried at the end of the arm j^2 , engages the ratchet-wheel j' each time the armature D^1 is depressed, and upon its being released ad-
 vances the same, thereby causing the friction-
 40 rollers $i i$ to be revolved. A similar pawl, j^5 , is attached to the armature D^2 , and acts upon the ratchet-wheel j' to actuate the paper-feed-
 ing device in the same manner when the ar-
 mature D^2 is actuated.

45 The method of bringing one type-wheel or the other into operation, as desired, will now be described in connection with the device C , employed for controlling the circuit-con-
 nections.

50 Upon the armatures D' and D^2 , respectively, are carried two right-angled extensions, L' and L^2 . An arm, m' , moving in a suitable bearing, m^2 , is linked to the extremity of the extension L' . A similar arm, n' , is linked to the extension L^2 , and is carried in a bearing, n^2 . The movements of the armature D' to-
 ward and away from its electro-magnet cause the arm m' to be moved to and fro in its bear-
 55 ings in a longitudinal direction, and in like manner the arm n' is actuated by the move-
 ments of the armature D^2 .

60 At the extremity of the arms m' and n' , respectively, are pivoted two latch-pawls, i' and i^2 . These pawls are employed for moving the circuit-controlling arm C from one of its con-
 tact-points c^2 or c^3 to the other. This arm C is carried upon a centrally-pivoted lever, I . The respective extremities i^3 and i^4 of this lever are designed to be engaged by the re-
 65 spective pawls i' and i^2 , which are normally pressed in the direction of the lever by means

of suitable springs. A T-shaped lever, R , is employed, however, for forcing one or the other of the pawls i' or i^2 away from the corre-
 sponding extremity of the lever I .

70 The movements of the lever R are controlled in the following manner: Upon the arm m' is carried a projection, m^1 , which extends into proximity to a pivoted finger, o' , carried upon the shaft t' of the type-wheel T' . A similar
 75 projection, n^1 , extends from the arm n' into proximity to the pivoted finger o^2 , carried upon the sleeve t^2 of the type-wheel T^2 . The fingers o' and o^2 are normally arrested, for the purpose of printing, in such positions that they are not
 80 in the longitudinal paths of the two projec-
 tions or lugs, m^1 and n^1 . Either type-wheel, however, may be arrested in such a position that its stop will be in the longitudinal path of the corresponding projections or lugs m^1 or
 85 n^1 . If one of the type-wheels, T^2 , for instance, be so arrested, and the armature D^2 be caused to approach the poles of its electro-magnet, the arm n' will be thrust forward, the projection
 90 n^1 striking against the finger o^2 , which is there-
 upon pushed forward against the tension of a spring, s' . Such a movement of the stop may, it is evident, be occasioned at the will of the
 transmitting-operator whenever the electro-
 95 magnet $B^2 B^1$ is connected in circuit, and, like-
 wise, when the electro-magnet $B' B^2$ is in cir-
 cuit, the finger o' will be thrust forward in pre-
 cisely the same manner by means of the pro-
 100 jection m^1 . Such movements of the fingers o' and o^2 are employed for controlling the posi-
 tion of the T-shaped lever R through the agency of two sliding rods, p' and p^2 . These rods are respectively pivoted or linked to the
 105 opposite extremities of an arm or lever, p , se-
 cured to and moving with the T-shaped lever
 R . The rod p' is provided with a projection or lug, p^3 , extending toward the type-wheel shaft t' , and the arm p^2 is likewise provided with a lug, p^4 , projecting toward the sleeve t^2 .
 110 The lug p^3 is in such a position that when the stop o' is forced forward it will, if the lever R be in the position shown in the drawings, strike against the stop or lug p^3 and turn the lever p upon its axis, thus moving the T-shaped arm
 115 R from the position shown in the drawings. The latch-pawl i' will thereupon be released and allowed to engage the corresponding ex-
 tremity, i^3 , of the arm I . The pawl i^2 , however, will at the same time be thrust out of engage-
 120 ment with the extremity i^4 and stand in a po-
 sition corresponding to that in which the pawl i' was previously held. The subsequent move-
 ment of the arm m' in response to the move-
 ment of the armature D' away from the poles of its electro-magnet will cause the pawl i' to
 125 turn the arm C upon its axis, moving it from its contact-point c^2 to the point c^3 . The cir-
 cuit of the main line will thereupon be com-
 pleted through the electro-magnet $B^2 B^1$, while the circuit of the electro-magnet $B' B^2$ will be
 130 open. In precisely the same manner, by ar-
 resting the type-wheel T^2 in the proper posi-

tion for bringing the finger o^2 in the path of the finger n^1 , the T-shaped lever R will be turned in the opposite direction, re-establishing the connections of the main line through the electro-magnet B' B², the parts then being

For the purpose of assisting the action of the pawls, I attach to the armatures D' and D³, respectively, suitable retractile springs, s^3 and s^4 , of well-known construction. An eccentric spring, s^4 , is applied to the circuit-controlling arm C, for the purpose of insuring a reliable contact of that arm with one or the other of its contact-points c^3 or c^2 .

For the purpose of insuring that the type-wheel at any time being actuated shall be arrested in the proper position to place the corresponding arm, o' or o^2 , in the path of the corresponding projection, m^1 or n^1 , for the purpose of transferring the type-wheels, it may be desirable to run the same to unison, and then subsequently allow it to advance to the predetermined position for transferring. Such a position may be determined in the same manner as the unison-point is usually determined. The transmitting-operator will usually bear in mind which type-wheel is being employed at any time for printing, and there will therefore be no difficulty in determining the position in which the transmitter should be arrested for transferring; but in the event that the wheels should become displaced, the first attempt to transfer will not operate upon the receiving-instrument and the proper type-wheel will remain in position.

The unison of the respective type-wheels with the transmitting apparatus is secured by means of two drums, U' and U², which are respectively applied to the type-wheel shaft t' and sleeve t^2 . Each of these wheels is constructed with a flange, u' , in which is formed a narrow opening, u^2 . An arm, u^3 , is applied to the drum U', and this arm carries a detent, u^4 , which is designed to secure the unison of the type-wheel T' by intercepting the path of a stop, u^5 , projecting from the surface of the drum or flange u' . The detent u^4 is of such length that it cannot fall through the slot u^2 , and it is held out of the path of the corresponding stop u^5 during the process of printing from the corresponding type-wheel by the action of one or more pivoted fingers, u^6 , which are shorter than the detent carried upon the arm u^3 ; but these fingers preferably are arranged in different radial lines from each other and from the detent u^4 with reference to the axis of the corresponding drum. By resting upon the surface of the cylinder these fingers serve to hold the detent above and out of the path of the stop u^5 . At each revolution of the drum, however, one of the corresponding fingers falls through the slot and allows the detent to approach near to the drum or flange; and it is evident that if a sufficient number of revolutions of the drum be made, the detent will be permitted to fall and rest upon the drum in the

path of the stop u^5 . By placing the fingers in successive radial lines I am enabled to prevent more than one of them from falling through the slot at each revolution of the drum.

For the purpose of removing the detent u^4 from the path of the stop u^5 when it is desired to actuate the type-wheel after it has been brought to unison, and also for the purpose of preventing the detent from intercepting the path of the stop during the process of printing continuously from one type-wheel, I prefer to pivot the fingers u^6 to the arm u^3 , and to normally hold them in their position by means of springs u^7 . These springs, however, permit the arms to be turned downward upon their pivots when the arm u^3 is raised and the fingers are brought in contact with the inner surface of the flange. An arm, R', is secured to the arm L', attached to the armature D', which moves with the same, and by projecting across the path of the heel u^8 of the arm u^3 serves to depress the same and to elevate that arm until the lower flange, u^8 , is brought outside the flange of the drum each time an impression is made. When, however, it is desired to bring the type-wheel to unison, it is necessary only to allow a sufficient number of alternating impulses to be transmitted to allow all the fingers to drop through the aperture u^2 . A precisely similar device is employed in connection with the drum U² and armature D³ for securing the unison of the type-wheel T².

It is evident upon an inspection of the drawings that when either type-wheel is being actuated the other type-wheel will be locked in a given position, which may or may not be its unison-point, by means of the corresponding pawl and ratchet-wheel, which prevent its movement in one direction, and the corresponding pivoted finger, which, by striking against the longitudinally-movable arm, prevents its movement in the opposite direction.

For the purpose of insuring that the fingers of the unison device shall rest upon the surface of the drum instead of falling through the slot whenever they are thrown up, after having brought the type-wheel to rest at its unison-point, I prefer to place the stop u^5 a slight distance beyond the slot, as shown in the drawings.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of an electro-magnet, means for vitalizing said electro-magnet, two armatures polarized by induction from said electro-magnet, two electro-magnets to which said armatures are respectively applied, and means, substantially such as described, for completing the connections of an electric circuit through one or the other of the last named electro-magnets.

2. The combination, substantially as hereinbefore set forth, of an electro-magnet, two armatures polarized by induction from said electro-magnet, two electro-magnets to which

said armatures are respectively applied, two independent armatures respectively applied to the last-named electro-magnets, and means, substantially such as described, actuated by
5 said armatures for completing the connections of an electric circuit through one or the other of said electro-magnets.

3. The combination, substantially as hereinbefore set forth, of two armatures, two electro-magnets to which said armatures are respectively applied, two type-wheels respectively revolved through the agency of said armatures in response to electric impulses transmitted through their respective electro-magnets, and means, substantially such as described, controlled by either of said electro-magnets for interrupting the connections of an electric circuit through the coils of the same, and substituting therefor a like connection
20 through the coils of the other electro-magnet.

4. The combination, substantially as hereinbefore set forth, of two armatures, two electro-magnets to which said armatures are respectively applied, two type-wheels respectively revolved through the action of said armatures, two independent armatures respectively applied to said electro-magnets and responding to currents of greater duration than the currents required for actuating the first-named armatures, and a circuit-controlling device actuated by the last-named armatures and operating to substitute for the connections of an electric circuit through one of said electro-magnets a similar connection through the other when the corresponding type-wheel has been arrested in a predetermined position.
35

5. The combination, substantially as hereinbefore set forth, of two type-wheels, two electro-magnets, two armatures respectively applied thereto acting in response to electric impulses transmitted through the coils of the same to revolve one or the other of said type-wheels, two independent armatures respectively applied to said electro-magnets, and a circuit-changing device actuated by means of either of the last-named armatures when the corresponding type-wheels have been arrested in a predetermined position to substitute for the connections of an electric circuit through its electro-magnet a similar connection through the other of said electro-magnets.
50

6. The combination, substantially as hereinbefore set forth, of two type-wheels respectively carried upon a type-wheel shaft, and a sleeve surrounding said shaft, two electro-magnets, two armatures respectively applied thereto and responding to electric impulses transmitted therethrough, two ratchet-wheels, respectively applied to said type-wheel shaft and sleeve, means, substantially such as described, for actuating one or the other of said type-wheels through the action of one of said armatures upon the corresponding ratchet-wheel, two independent armatures respectively applied to said electro-magnets and responding to prolonged impulses transmitted
65

through the coils of the same, and two independent platens respectively applied to said type-wheels and acting in response to electric currents of the last-named character to impel the corresponding platen in the direction of its type-wheel.
70

7. The combination, substantially as hereinbefore set forth, of two type-wheels, two electro-magnets, means, substantially such as described, for revolving said type-wheels independently of each other through the agency of electric impulses transmitted through one or the other of said electro-magnets, two independent armatures respectively applied to said electro-magnets, a circuit-controlling device for completing the connections of an electric circuit through one or the other of said electro-magnets, and means, substantially such as described, for actuating said circuit-controlling device through the agency of said independent armatures.
85

8. The combination, substantially as hereinbefore set forth, of two electro-magnets, two armatures respectively applied thereto, two pivoted fingers revolved through the agency of said armatures, two independent armatures respectively applied to said electro-magnets and responding to currents of greater duration than those required for actuating the first-named armatures, two movable rods respectively actuated by the movements of said independent armatures, and a centrally-pivoted lever for causing the connections of an electric circuit to be completed through one or the other of said electro-magnets, and means, substantially such as described, co-operating with said rods to actuate said lever when either one of the pivoted fingers has been arrested in a predetermined position.
100

9. The combination, substantially as hereinbefore set forth, of a circuit-closing arm, two arms projecting from the same, two pawls respectively applied to said arms, a rock-lever acting to retain one or the other of said pawls away from its corresponding arm, two electro-magnets, and means, substantially such as described, for causing either of said electro-magnets to actuate said rock-shaft.
110

10. The combination, substantially as hereinbefore set forth, with a type-wheel and its shaft, of a circular flanged plate attached to said shaft, a stop carried upon the flange of said plate, a detent extending into proximity to said flange, one or more pivoted fingers, which, by resting upon said flange, serve to normally hold said detent out of the path of said stop, and means, substantially such as described, for permitting said detent to periodically approach the path of said stop when the type-wheel is actuated without printing.
120

11. The combination, substantially as hereinbefore set forth, with a type-wheel, of a circular flanged plate moving therewith, a stop carried upon said plate, a detent for intercepting the path of said stop, one or more fingers secured to the support of said detent,
130

and a slot in the flange of said plate through which one of said fingers is allowed to fall at each revolution of said plate.

12. The combination, substantially as here-
5 inbefore set forth, of a type-wheel, a circular flanged plate moving therewith, a stop carried upon the said plate, a detent for intercepting the path of said stop, and a series of pivoted fingers for holding said detent out of the
10 path of said stop, each of said fingers being arranged in a different radial line, substantially as described.

13. The combination, substantially as here-
inbefore set forth, with a circular flanged
15 plate, a stop carried upon said plate, a detent for intercepting the path of said stop, a series

of pivoted fingers for holding said detent out of the path of said stop, means, substantially such as described, for causing said fingers to permit said detent to approach the path of
20 said stop, an electro-magnet, its armature and armature-lever, and means, substantially such as described, for causing the movements of said lever to cause said detent to be thrown out of the path of said stop.

In testimony whereof I have hereunto subscribed my name this 12th day of November,
25 A. D. 1883.

ROBERT J. SHEEHY.

Witnesses:

DANL. W. EDGECOMB,
CHARLES A. TERRY.