(No Model.) 4 Sheets—Sheet 1.

R. J. SHEEHY.

PRINTING TELEGRAPH.

No. 307,234. Patented Oct. 28, 1884.

Fig. 1.

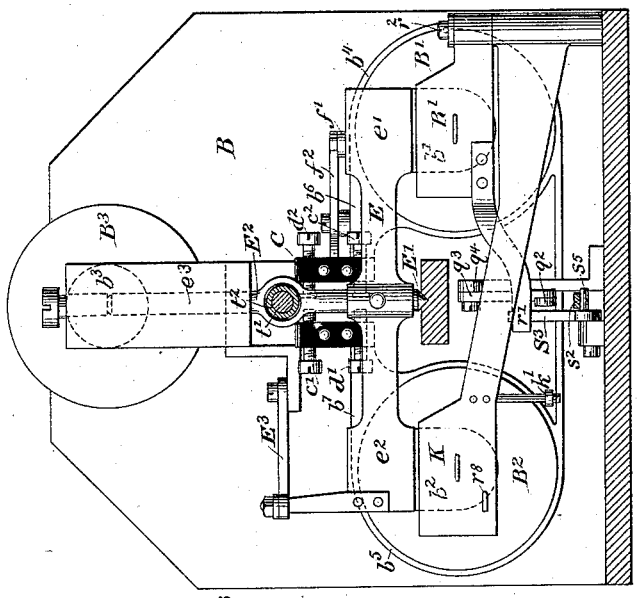
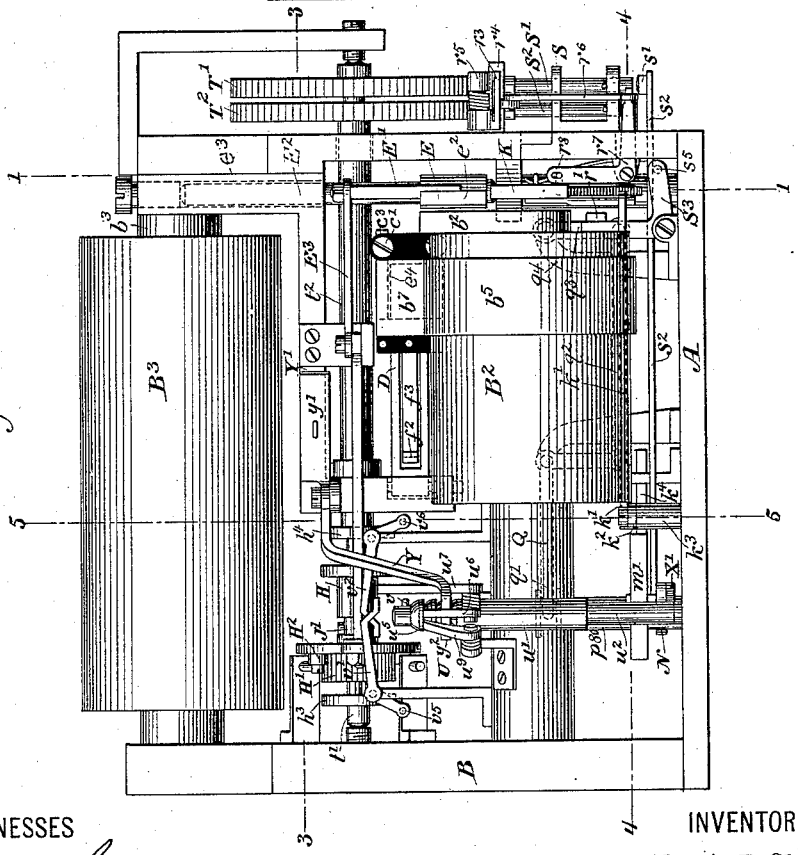


Fig. 2.



WITNESSES

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PRINTING TELEGRAPH.

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Fig. 3.

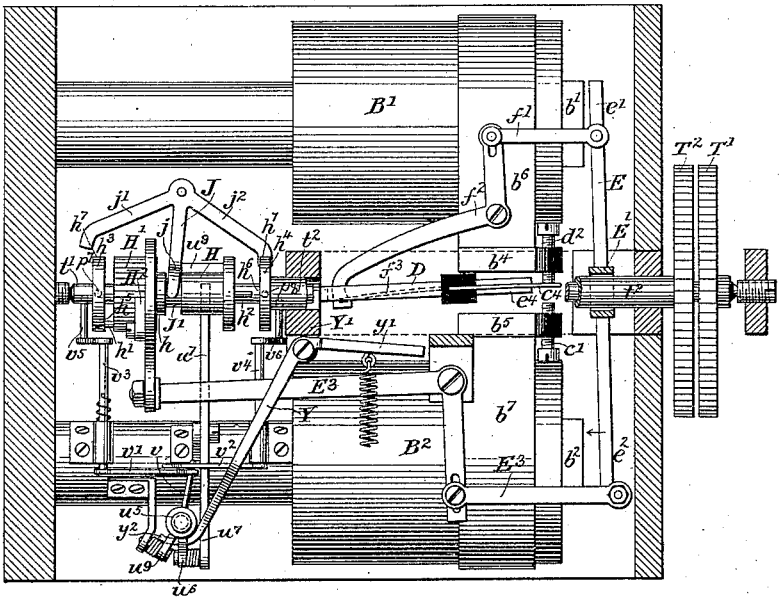

Fig. 4.

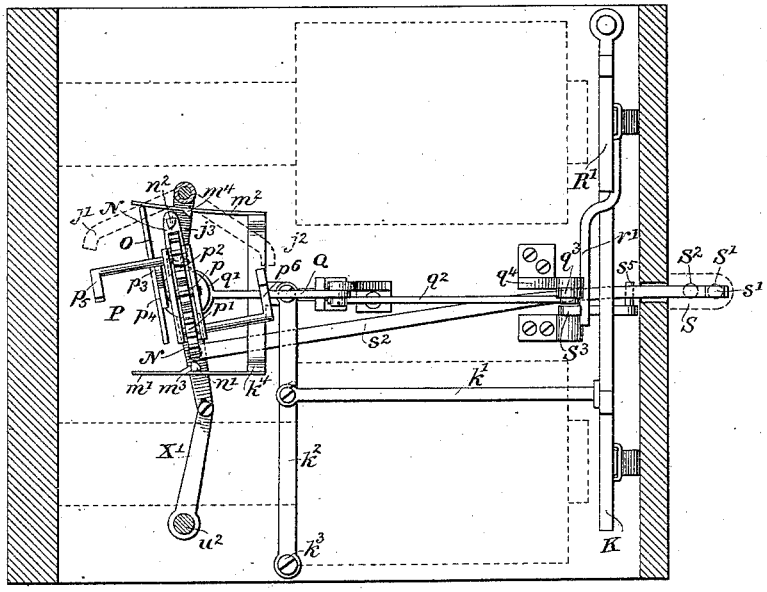

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Fig. 5.

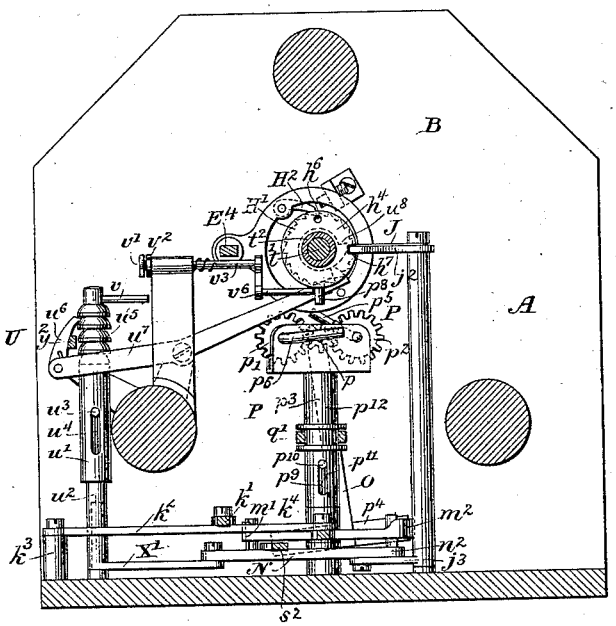
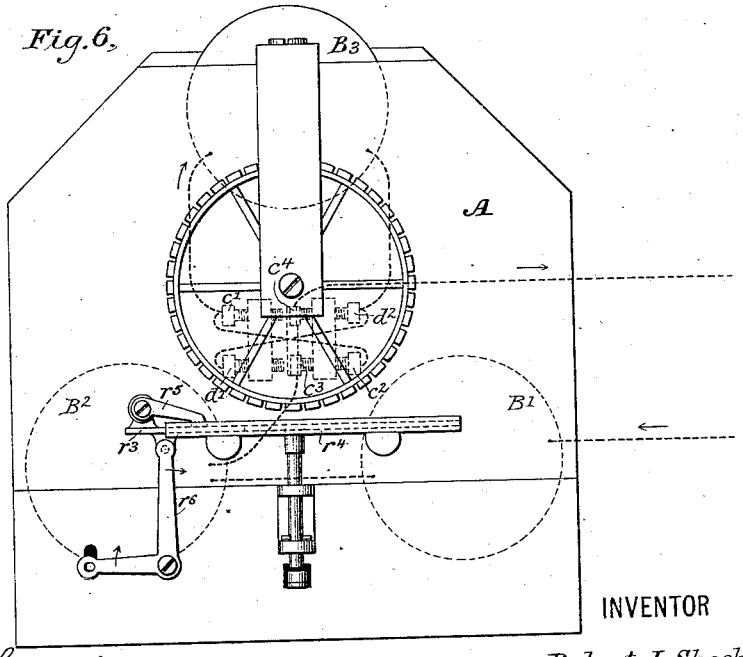


Fig. 6.



WITNESSES

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(No Model.) 4 Sheets—Sheet 4.

R. J. SHEEHY.

PRINTING TELEGRAPH.

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Fig. 7,

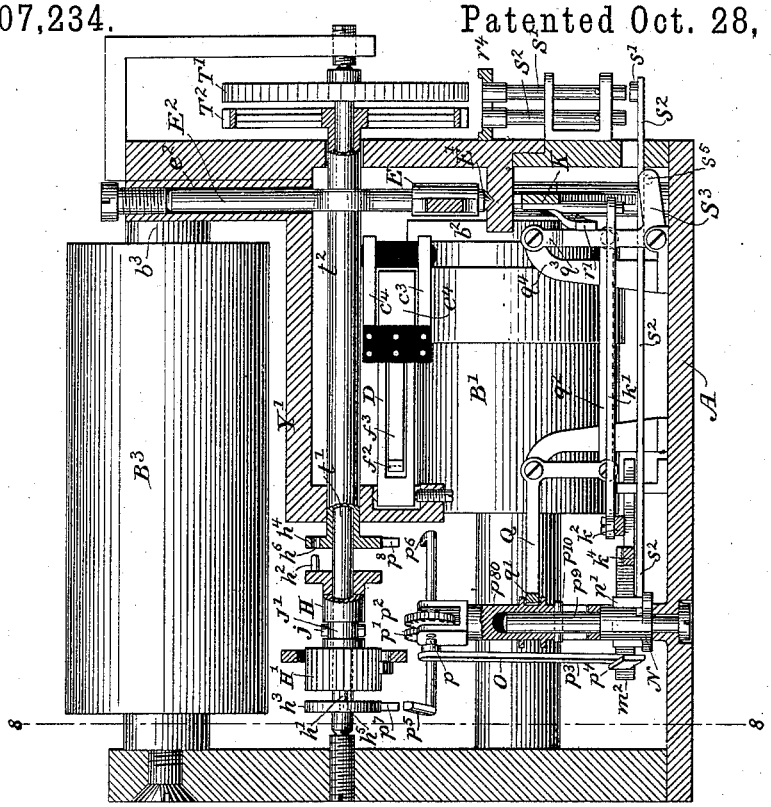
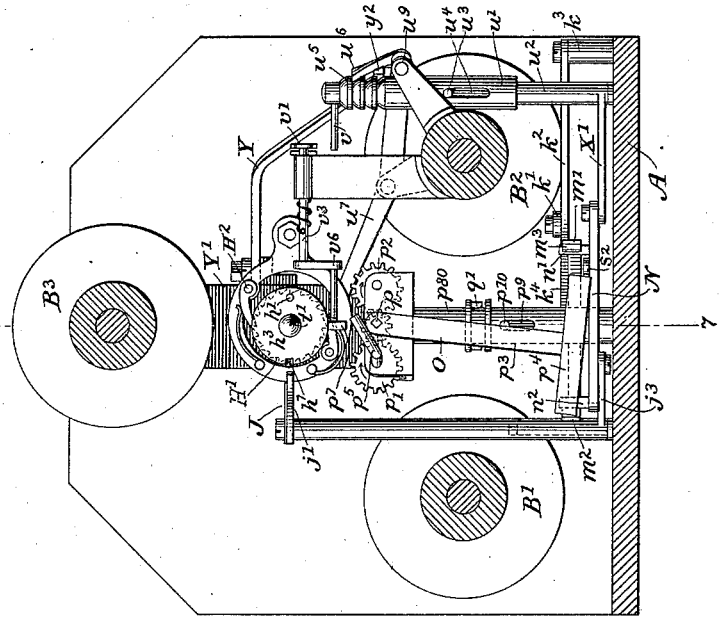


Fig. 8,



WITNESSES

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UNITED STATES PATENT OFFICE.

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

PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 307,234, dated October 28, 1884.

Application filed December 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 the class of printing-telegraph receiving-instruments in which two type-wheels are employed for recording in suitable characters the messages or dispatches which are transmitted over a single main-line conductor through the agency of electric currents and impulses.

The object of the invention is to provide means for conveniently and reliably effecting, by means of electric impulses transmitted over a single main line, the following results, viz: rotating the particular type-wheel from which impressions are at any time being effected; causing the remaining type-wheel to stand in a predetermined position of rest; arresting the moving type-wheel in any desired position for printing; effecting impressions of the characters upon that type-wheel which has thus been caused to stand above the printing-platen; transferring to the other type-wheel, when desired, and operating the same in a like manner, and arresting either type-wheel at a predetermined unison-point at will.

The invention consists in constructing the apparatus in substantially the following manner: The two type-wheels are respectively mounted upon a shaft and a sleeve surrounding that shaft. A movable clutch is mounted upon this shaft and adapted to be locked either with the shaft or with the sleeve, according to the position which it is caused to assume. Moving with this clutch is a ratchet-wheel adapted to advance the same step by step in response to electric impulses of alternating polarity which are transmitted through the coils of the electro-magnets of the instrument. The one wheel or the other will therefore be advanced accordingly as the clutch is locked with the shaft or with the sleeve. An independent armature applied to one of the electro-magnets is arranged to cause the clutch to be shifted longitudinally upon the type-wheel shaft when the type-wheel with which it is locked has been arrested at a predetermined point in its revolution. If, then, an impulse of the proper character be transmitted, the clutch will be transferred from its position of engagement with one wheel to a like position with reference to the other. Either wheel which has been revolved may be arrested in any of the successive positions which it is caused to assume by simply interrupting the series of impulses transmitted to the electro-magnets of the instrument. Each type-wheel, when not in actual operation, is automatically arrested at a predetermined point in its revolution. An independent armature responding only to impulses of a longer duration than those employed for actuating the type-wheels is employed for effecting impressions from the particular type-wheel which is being rotated. Each type-wheel is provided with its individual printing-platen, and these platens are both provided with a single actuating-lever, which is moved in position to engage one or the other, accordingly as the characters are to be printed from one or the other of the type-wheels. The unison of the type-wheels with the transmitting-instrument is secured by means of a detent, which, during the revolutions of the clutch, is caused to advance into the path of a stop moving with the type-wheel which is to be brought to unison. Each time an impression is effected from either type-wheel the detent is released, and the full number of revolutions of the type-wheel are subsequently necessary before the type-wheel will be arrested. The particular organization of electro-magnets whereby the type-wheels are actuated which I prefer to employ consists of two electro-magnets included in circuit in the main line. The circuit-connections of one of the three, however, are reversed with reference to the main line at each change in the polarity of the currents transmitted thereto—that is to say, each time the polarity of the currents transmitted through the instrument is reversed the terminals of the coils of this electro-magnet are also reversed, and in consequence the polarity of the electro-magnet remains unchanged. The polarities of the remaining magnet, however, are reversed at each reversal of current upon the main line. Applied to the two electro-magnets is an armature normally polarized with a given polarity

by means of the magnetism of constant polarity induced in the reversible electro-magnet. This armature extends before the poles of the two remaining electro-magnets, and it is so pivoted that it will be actuated at each reversal in the polarization of the same. The movement thus occasioned is converted, as already stated, into a rotary movement of the ratchet-wheel, and thus of either one or the other of the type-wheels.

The invention includes several details of construction and organization, which will be hereinafter fully described.

In the accompanying drawings, which illustrate the invention, Figure 1 is a front elevation of the instrument through the plane 1 1, Fig. 2. Fig. 2 is a side elevation of the complete instrument. Fig. 3 is a plan view, one of the electro-magnets being removed. Fig. 4 is a plan view through the plane 4 4, Fig. 2. Fig. 5 is a front elevation through the plane 5 5, Fig. 2; and Fig. 6 illustrates the construction of the paper-feeding device, together with the organization of circuits. Fig. 7 is a vertical transverse section illustrating the organization of the platen and type-wheel transferring devices. Fig. 8 is a rear elevation, partly in section, illustrating the organization of the transferring devices.

Referring to these figures, A represents the frame upon which the various parts of the mechanism are supported, and B′, B², and B³ represent electro-magnets employed for actuating the same. These electro-magnets are designed to be included in series in the circuit of the main line of the system. The circuit-connections, however, of the electro-magnet B³ are reversible by means of a circuit-controlling device, C. This device consists of four contact-points, c' c^2 and d' d^2, between which extend two yielding contact-springs, c^3 and c^4. The contact-points c' and c^2 are respectively connected with each other and with one terminal of the coil of the electro-magnet B³. Likewise the points d' and d^2 are connected with each other and with the remaining terminal of the coil of electro-magnet B³. The contact-springs c^3 and c^4, Fig. 6, are respectively connected with the main-line conductor and with the conductor leading through the coils of the two remaining electro-magnets B′ and B². It will be seen, therefore, that when the contact-springs c^3 and c^4 are toward the points c^2 and d^2 a current from the main line will be transmitted through the coils of the electro-magnet B³ in the direction indicated by the arrow. When, however, the contact-springs rest against the points c' and d', the direction of the current through the coils will be the reverse. The contact-springs c^3 and c^4 are carried upon a lever, D, Fig. 3, which is alternately actuated in one direction and the other by the movements of the propelling-armature E of the type-wheel, in a manner hereinafter described. The armature E extends in front of the poles of the two electro-magnets B′ and B², and is secured to or constitutes a part of a vertical shaft, E′, which is pivoted at its upper extremity in a suitable bearing in the extension of the pole of the electro-magnet B³. This section E² of the armature preferably extends through or into a hollow portion, c^5, of the extension, and is thus placed in magnetic contact with the pole of the electro-magnet B³. It will therefore receive by induction a polarization accordingly. Thus, if the electro-magnet B³ be so vitalized that its pole b^3 is north, then by induction the extremities e' and e^2 of the armature will partake of the same polarity. Considering that the current required to develop magnetism of this character in the pole b^3 when the circuit-closing device C is in the position shown in the drawings—that is to say, toward the right hand—is such as will induce in the pole b' of the electro-magnet B′ north polarity and in the pole b^2 of the electro-magnet B² south polarity, the armature E will be impelled in the direction indicated by the arrow—that is to say, the extremity e^2 will be attracted toward the pole b^2, and the extremity e' will be repelled from the pole b'. If, then, the polarity of the current be reversed without reversing the polarization of the armature, the latter will be impelled in the opposite direction. It will be necessary, in order to retain a constant polarity, therefore, on the part of the electro-magnet B³, to reverse the connections of its coils each time the polarity of the current upon the main line is reversed. This is accomplished by means of the circuit-controller C in the following manner: An arm, f', Fig. 3, is pivoted to the end e' of the armature E, and one extremity of the same is linked to a pivoted lever, f^2. To the long arm of this lever is fastened a flexible spring, f^3. The remaining end of this spring is attached to the support D of the springs c^3 and c^4, and serves to impart to the same a pressure in one direction or the other, according to the position occupied by the armature E. Thus, if the armature E be in the position indicated in the drawings, the extremity e' being in proximity to the pole b', the spring f^3 will be pressed toward the left hand, and there will be a tendency on the part of the same to force the arm D in the same direction. This tendency, however, is overcome so long as the electro-magnets are vitalized by means of two polar extensions, b^4 and b^5, which are respectively applied to soft-iron bands b^6 and b^7, surrounding the coils of the electro-magnets B′ and B², respectively. The armature e^4 is held toward the one into proximity to which it has been placed so long as the magnetization of the electro-magnets continues. At an interruption, however, of the circuit, the attractive force exerted by the polar extension b^4, for instance, being caused to cease, the force of the spring f^3 will impel the arm D in the opposite direction. The circuit-connections of the coils of the magnet B³ will thereupon be reversed, in the manner already described. The next succeeding current of opposite polarity will therefore occasion like

magnetization on the part of the electro-magnet B^3, but it will reverse that of the electro-magnets B′ and B^2. The armature E will therefore be impelled in the opposite direction, and the spring f^3 will be placed in position to cause the circuit-controller C to again reverse the connections of the electro-magnet B^3 and to reinstate the former conditions as soon as the current is again interrupted or its direction changed. In this manner alternating positive and negative impulses will cause a uniform vibration on the part of the armature E. It will be understood that for the reason that the polarization of the electro-magnet B^3 is never reversed it may with advantage be of considerable size, and its action may be slow in comparison with that of the electro-magnets B′ and B^2. The vibrations of the armature E which are thus occasioned are employed for actuating one or the other of two type-wheels, T′ and T^2, accordingly as the support of one or the other is engaged by a clutch, H. The type-wheels are respectively mounted upon a shaft, t', and a sleeve, t^2, surrounding the same. The clutch H consists of a sliding sleeve, h, which surrounds the shaft t', and which carries or is formed into a pinion, H′, designed to be engaged by a driving-pawl, H^2, and thus to be advanced step by step by the movements of the armature E. The pinion is of sufficient length to insure that it will be engaged by the pawl whether the clutch be in position to engage one type-wheel or the other. The pawl is driven by means of a suitable system of levers, E^3, connecting the pawl with one arm, e^2, of the armature. The clutch H is also provided with two clutch-pins, h' and h^2, adapted to engage one or the other of two disks, h^3 and h^4, respectively, secured to the shaft t' and to the sleeve t^2. These disks are each provided with a single perforation, h^5 and h^6, for receiving the corresponding locking-pins. When the clutch is in the position shown in the drawings, Fig. 3, the pin h', by engaging the disk h^3, locks the same to the shaft t'. If, however, the clutch be moved in the opposite direction, the pin h^2 will engage the disk h^4 and lock the sleeve t^2 of the type-wheel T^2. The means whereby this clutch is transferred from one of its positions to the other consist of a lever, J, engaging the sleeve h by means of its forked extremity j entering an annular groove, J′, formed in the sleeve. The lever is provided with two arms, j' and j^2, which are respectively designed to engage the peripheries of the two disks h^3 and h^4, permitting the one to revolve while the other is arrested. For this purpose each disk h^3 and h^4 is provided with a slot, h^7, (see Figs. 3 and 5,) into which the extremity of the corresponding arm extends when the device J is turned upon its axis.

The method of operating this device when it is desired to unlock one of the type-wheels and to lock the other is as follows: To the paper-feeding armature K, which will be hereinafter described, and which responds to the prolonged currents employed for printing, is pivoted a link, k'. This link in turn is pivoted to a lever, k^2. One end of the lever k^2 is pivoted to the frame at k^3. The other end of this lever carries a support, k^4, for two springs, m' and m^2. These springs are respectively provided with hooks or latches m^3 and m^4, projecting toward the respective extremities of a cross-arm or rocking lever, N. To one arm, n^2, of this lever is pivoted an extension, j^3, of the rocking lever J. When, therefore, the device is in the position shown in the drawings, (see Fig. 4,) the arm j^2 will be in engagement with the disk h^4 of the type-wheel sleeve t^2, but the arm j' will be held away from the corresponding disk, h^3. If, however, the rock-lever N be turned upon its central axis, so that the arm n^2 moves toward the right hand, the device J will be turned upon its axis so that its arm j' will engage the disk h^3 and lock the type-wheel shaft t', at the same time freeing the disk h^4 from engagement with the arm j^2. The same movement of the device J transfers the clutch H from one disk to the other, causing the one to be locked and the other to be released, in a manner already described.

The method of actuating the rock-lever N in this manner, when desired, is as follows: The two springs m' and m^2, which extend near the respective extremities of the lever N, are provided with a controlling-arm, O, which is designed to hold either one or the other spring out of the path of the corresponding catch, n' or n^2, carried upon the respective extremities of the lever N. This device is actuated through the instrumentality of a pinion or idle wheel, p, and two toothed wheels, p' and p^2, which are placed upon opposite sides of the same, and which are engaged thereby. (See especially Figs. 4 and 5.) The central wheel or pinion, p, carries upon an extension of its axis or arbor the circuit-controlling arm O, above referred to. This circuit-controlling arm consists of two portions—namely, an arm, p^3, which is secured to the pinion or idle wheel p, and of a cross-arm, p^4, which is carried at the lower extremity of the arm p^3. The respective ends of the cross-arm p^4 extend into proximity to the spring-arms m' and m^2, and it serves, when moved to one side or the other, to press one or the other of these springs outward, so that the corresponding latch, m^3 or m^4, will be out of the path of its catch n' or n^2. Each of the wheels p' and p^2 is provided with an L-shaped arm, as shown at p^6 and p^5, respectively. These arms p^5 and p^6 respectively extend beneath the two corresponding pins, p^7 and p^8, which are respectively carried upon the type-wheel shaft t' and the sleeve t^2. The whole device P is supported upon a sleeve, p^{12}, surrounding a stud or support, p^9, and upon which it is vertically movable, being coupled therewith by means of a pin and slot, as shown at p^{10} and p^{11}. When the device P is moved upward, it will not be acted upon unless the path of one or the other of the arms p^5 or p^6 is intercepted by the corresponding

pin, p^7 or p^8. If, however, the type-wheel T^2, for instance, is being actuated, and its supporting-sleeve t^2 be arrested in such a position that the pin p^8 is above and in the path of the arm p^6, then this arm will be held down while the device P is forced upward. The corresponding toothed wheel, p', will therefore be turned toward the right hand, Fig. 5, into the position shown in the drawings. The movement of the wheel p' is communicated to the central pinion, p, and the cross-arm p^4 is thus carried into such a position that the spring m^2 will be pressed outward, as shown in Fig. 4. If, on the other hand, the instrument is being operated with the parts in the position shown in the drawings, the type-wheel T′ being employed for giving impressions, and it is desired to transfer to the type-wheel T^2, the type-wheel T′ should be arrested in such a position that the pin p^7 on the shaft t' (see Figs. 3 and 4) is above the arm p^5. The device P being then elevated, the arm p^5 will be engaged by the pin p^7. The wheel p^2 will be actuated, causing the pinion p and the arm p^3 to be turned, so that the spring-arm m^2 will be released from the cross-arm p^4 and the spring-arm m' pressed outward. The next subsequent longitudinal movement of the springs m' and m^2, which is occasioned by means of the movements of the paper-feeding armature before referred to, will cause the latch m^4 to engage the catch n^2, causing the lever N to be turned upon its axis, thereby moving the clutch H, through the instrumentality of the device J, from engagement with the disk h^3 into the corresponding engagement with the disk h^4. The arm j' is by the same operation placed against the periphery of the disk h^3, entering the slot h^7, while the arm j^2 is released from the disk h^4. The type-wheel T^2 will thereupon be free to be actuated, while the type-wheel T′ will be locked. The movement of the device P upon its vertical axis causes the particular arm, p^5 or p^6, which was brought into engagement with the stop or pin p^7 or p^8 to be carried out of the axial line of the type-wheel shaft and sleeve. During the subsequent upward movements of the device P that arm p^5, for instance, will not be in a position to strike the corresponding arm or pin. The other arm, p^6, however, will, by the same movement of the device P upon its axis, be brought into position to be engaged by the pin p^8, provided the type-wheel T^2 is arrested in the position to bring the pin p^8 exactly above the arm p^6. In practice the type-wheel is arrested in this position only when it is desired to transfer the clutch from one type-wheel to the other. When it is desired to again actuate the type-wheel T′, it is necessary only to arrest the type-wheel T^2 in such a position that the pin p^8 will be above the arm p^6, and the next upward movement of the device P will actuate the lever J in the opposite direction and re-establish the former conditions.

The means whereby the device P is moved vertically whenever desired comprise a right-angled lever, Q, the long arm of which engages, by means of a fork, q', the sleeve p^8. The short arm of this lever is pivoted to one end of a link, q^2. The opposite end of this link is pivoted to a lever, q^3, supported from a bracket, q^4. The lever q^3 is actuated by the press-lever R′, in a manner hereinafter described. Each time this press-lever is actuated the link q^2 is thrown backward, thereby causing the lever Q to throw the sleeve p^8 upward, thus actuating the device P, in a manner already described.

It will be evident that as often as the apparatus is adjusted to print from one or the other of the type-wheels it will be necessary to actuate the corresponding platen. To accomplish this result I provide the two type-wheels T′ and T^2 with two movable platens, S′ and S^2, respectively. These platens are supported in a suitable bracket, S, in which they are vertically movable. Beneath them extends a hammer, s', carried upon an arm or lever, s^2. The remote end of this lever is pivoted to the lever N. Each time, therefore, that the lever N is actuated the arm s^2 will be moved in one direction or the other, thereby carrying the platen-hammer s' from its position beneath the one of the platens S′ or S^2 to a corresponding position relative to the other platen. Thus in the drawings the platen-hammer s' is shown beneath the platen S′. If, however, the device N be actuated so as to release the type-wheel T^2 and lock the type-wheel T′, the platen-hammer s' will be at the same time transferred from the platen S′ to the platen S^2. For the purpose of actuating this platen-hammer, and thus the platen beneath which it chances to stand, a pin or arm, s^5, is carried upon one arm of a right-angled lever, S^3. Upon this pin rests the arm s^2, which is thrown upward each time the lever S^3 is actuated, causing an impression to be taken from one or the other of the type-wheels. The armature R′, which serves to actuate the lever S^3, and thus to effect the impressions, is applied to the electro-magnet B′, and responds to electric impulses of whatever polarity having a greater duration than those employed for actuating the armature E. An arm, r', extending from the armature R, passes in front of one arm of the bent lever S^3, and each time the armature R is drawn toward its electro-magnet it actuates this bent lever, and not only operates the device P in the manner already described, but also actuates the platen-hammer s', causing an impression to be effected.

For the purpose of causing the paper tape upon which the impressions are received to be advanced each time an impression is made or a space is desired upon the tape, an armature, K, is applied to the electro magnet B^2, and this armature is designed to respond to the electric currents of the same character as those causing the armature R′ to be actuated. It is, however, preferably supported from the same standard, r^2, as the armature R′, and it is there-

fore acted upon through a longer leverage, and preferably through a greater distance. The attraction exerted by the electro-magnet B^2 upon its armature will be increased as soon as the armature R′ has responded to the attraction of the electro-magnet B′ by reason of the proximity of armature R′ to the pole of the magnet B′, for the reason that the magnetic metal comprising the armature, the cores of the magnet, and the back plate, B, upon which the magnets are supported, serve in much the same manner as the ordinary back piece or yoke of an electro-magnet to increase the magnetic effect exerted upon its armature.

The device which I prefer to employ for feeding the paper forward, and which is to be actuated by the movements of the armature K, consists of a movable slide, r^3, constituting an extension of the paper-guide r^4, and a pressure-clutch or friction-clutch, r^5, pressed toward the surface of the same. The paper tape, as it passes beneath the type-wheel, is led through the extension r^3 and beneath the clutch or pawl r^5, which is preferably serrated upon its edge to insure a better action of the same. One arm of a right-angled lever, r^6, is pivoted to the extension r^3. The other arm of this lever is linked to a second right-angled lever or bell-crank, r^7. This lever is provided with a sliding connection with the armature K, as shown at r^8. Each time this armature is drawn toward its electro-magnet the extension r^3 is impelled in the direction indicated by the arrow, Fig. 6. When, on the other hand, the armature K is drawn away from its electro-magnet by the action of its retractile spring, the extension r^3 is drawn backward away from the type-wheel, advancing the paper tape. The amplitude of the vibration of the extension of the pawl thus secured is sufficient to advance the paper a proper distance as each impression is taken. The pawl r^5 itself is supported upon the carriage and moves with the extension r^3.

The device U, which I prefer to employ for securing a unison between the transmitting device and the particular type-wheel which is being employed for printing, comprises a sleeve, u', supported upon and surrounding a standard, u^2, upon which it is secured by means of a pin, u^3, and slot u^4, which permits of its longitudinal movement. At the upper end of this sleeve are annular teeth u^5, each designed to be successively engaged by a pawl, u^6, carried upon one arm of a lever, u^7. The other arm of this lever projects against the periphery of a cam, u^8, carried upon the clutch H. Each time the clutch is revolved this cam actuates the lever u^7 and causes the sleeve u' to be elevated a distance corresponding to one of its annular teeth u^5.

At the upper extremity of the sleeve u' is carried a pin, v, which is caused by the successive movements of the sleeve to approach the path of one or the other of two cross-arms or levers, v' or v^2, which are respectively carried upon rocking shafts v^3 and v^4. The extremities of these shafts respectively carry two pins, v^5 and v^6, which are designed to intercept the paths of corresponding unison-stops respectively moving with the shaft t' and sleeve t^2, whenever it is desired to secure a unison of the corresponding type-wheel. These stops may be the pins p^7 and p^8, referred to in connection with device P. Normally the pins v^5 and v^6 are out of the paths of the corresponding pins, p^7 and p^8. If, however, the pin v be pressed upward against the corresponding arm, v' or v^2, it will turn the corresponding rock-shaft upon its axis and cause the corresponding pin, v^5 or v^6, to intercept the path of the unison-stop p^7 or p^8. If, therefore, the armature E be actuated continuously, the corresponding type-wheel will eventually be arrested at its unison-point by reason of the continued upward movement of the sleeve u' and pin v.

For the purpose of causing the pin v to strike against only one of the pins v' or v^2 when it is thus thrown upward, and to unison only the type-wheel which is being actuated, the support upon which the sleeve u' is carried is constructed to be turned so that the pin v will be beneath the arm v' only when the type-wheel T′ is being actuated and beneath the arm v^2 only when the type-wheel T^2 is being actuated. This is accomplished by securing to the standard u^2 an extension, X′, which is linked to the arm N. This support therefore moves in one direction or the other, according to the direction of the movement of the device J. Thus, if the device J be actuated so as to lock the type-wheel T^2 and release the type-wheel T′, the shaft u^2 will be rotated so that the pin v will stand beneath the pin v', and will therefore actuate only that corresponding device when the sleeve u' is raised to its upper limit. The parts are preferably so adjusted that the point at which the unison device will arrest either type-wheel is the same as that in which the type-wheels are caused to stand for the purpose of actuating the transferring device P. This particular organization is not, however, always essential.

For the purpose of preventing either type-wheel from being thus arrested when it is desired to print continuously from the same, I provide a lever, Y, which carries an armature, y', which is applied to an extension, Y′, of the core of the electro-magnet B^3. This armature responds whenever a current of sufficient duration to actuate the printing device is transmitted through the coils of the electro-magnets. As the polarity of the electro-magnet B^3 is constant, it may be necessary to adjust this electro-magnet carefully. It may, however, be applied to one of the other electro-magnets, B′ or B^2. An extension, y^2, of the arm Y passes behind the pawl u^6 and a dog, u^9, by means of which the sleeve u' is held in its upward position, and serves to throw them out, allowing the device to fall to its original position each time the armature y' is actuated. The entire number of revolutions of the type-

wheel will then be subsequently performed before the unison device will again be advanced a sufficient distance to arrest the type-wheel which is being actuated. In practice I prefer to have the same about three revolutions of the type-wheel. Whenever it is desired to bring the type-wheel to its unison-point, it is necessary only to complete, say, three revolutions, therefore, of that wheel without actuating the releasing device.

The operation of the device has been sufficiently described in connection with the description of the apparatus.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of two type-wheels respectively mounted upon a type-wheel shaft and a sleeve surrounding said shaft, a locking-clutch longitudinally movable along said shaft, and a device acting to transfer said clutch from engagement with said shaft into engagement with said sleeve and to simultaneously lock said shaft, and vice versa, substantially as described.

2. The combination, substantially as hereinbefore set forth, of two type-wheels, a clutch located in the axial line of said type-wheels, means, substantially such as described, for revolving said clutch, and a transferring device acting to release said clutch from engagement with one of said type-wheels and to place it in engagement with the other when the first-named type-wheel has been arrested in a predetermined position.

3. The combination, substantially as hereinbefore set forth, with two type-wheels, a clutch for engaging either one or the other of said type-wheels, and means for revolving said clutch, of a device for transferring said clutch, consisting of a lever engaging the same, a second lever or arm which is brought into position to actuate the first-named lever when the engaged type-wheel has been arrested at a predetermined point in its revolution, and means, substantially such as described, for actuating the second lever by an interruption of the electric currents employed for effecting impressions from said type-wheels.

4. The combination, substantially as hereinbefore set forth, of two type-wheels, a clutch for engaging one or the other of said type-wheels, the arm for transferring said clutch, the lever for acting upon said arm, the vertically-movable arms, one of which extends into the axial plane of said type-wheels, and means, substantially such as described, for causing said arms to move toward and from the axis of said type-wheels, and for causing the arm standing in the plane of said type-wheels to be actuated when the engaged type-wheel has been arrested in a predetermined position, and means, substantially such as described, for causing the arm thus engaged to place said arm in a position to cause the transfer of said clutch.

5. The combination, substantially as hereinbefore set forth, with a revolving shaft and a stop carried thereupon, of a vertically-movable arm, a pinion actuated by said arm, a lever actuated by said pinion, a detent secured to the support of said pinion, a resilient arm normally held out of the path of said detent, means, substantially such as described, for moving said resilient arm at right angles to the support of said detent, and means, substantially such as described, for permitting said resilient arm to engage said detent when said pinion has been actuated.

6. The combination, substantially as hereinbefore set forth, of two toothed wheels, two crank-arms respectively carried thereby, a central pinion actuated by either of said toothed wheels, two resilient arms, a lever extending from said pinion into the path of said resilient arms, which lever engages one or the other of the same, accordingly as one or the other of said crank-arms is primarily actuated.

7. The combination, substantially as hereinbefore set forth, of two type-wheels, a clutch for engaging one or the other of said type-wheels, two longitudinally-movable arms, two latches carried upon said arms, a lever for actuating said clutch, and means, substantially such as described, for causing one or the other of said latches to be held out of the path of said clutch-actuating lever, while the remaining arm is permitted to engage the same.

8. The combination, substantially as hereinbefore set forth, of the longitudinally-movable clutch, the system of levers for actuating the same, two detents respectively carried upon opposite extremities of one of said levers, two longitudinally-movable resilient arms for respectively engaging said detents, and means, substantially such as described, brought into action when the said clutch has been arrested in a predetermined position, for permitting one of said resilient arms to engage one of said detents, at the same time forcing the remaining resilient arm out of the path of the remaining detent.

9. The combination, substantially as hereinbefore set forth, of two revolving type-wheels and two stops moving therewith, two crank-arms respectively moved into the path of said stops, means, substantially such as described, for impelling said crank-arms to and from said stops, and means for turning the support of said crank-arms upon its axis, thereby throwing one or the other of said crank-arms out of the plane of its corresponding stop.

10. The combination, substantially as hereinbefore set forth, with two resilient arms and a lever for engaging one or the other of said arms, of a pinion for actuating said lever, two toothed wheels respectively engaging the opposite sides of said pinion, means, substantially such as described, for imparting to said pinions a vertical and a horizontal movement and causing one or the other of said toothed wheels to be actuated, thereby acting through said pinion to place said arm out of engagement with one and into engagement with the other of said resilient arms.

11. The combination, substantially as hereinbefore set forth, with two type-wheels, a clutch for engaging one or the other of the same, and means, substantially such as described, for operating said clutch, of a movable platen-hammer actuated by the movements of said clutch-transferring device.

12. The combination, substantially as hereinbefore set forth, of two type-wheels and two platens respectively applied to said type-wheels, a clutch for engaging one or the other of said type-wheels, means, substantially such as described, for transferring said clutch, and a platen-hammer caused to stand beneath one or the other of said platens, accordingly as said clutch engages one or the other of said type-wheels.

13. The combination, substantially as hereinbefore set forth, of two electro-magnets, an armature applied to the poles of one of said electro-magnets and normally polarized by the second electro-magnet, and means, substantially such as described, for reversing the circuit-connections of the second electro-magnet at each reversal in the polarity of a current caused to traverse its coils.

14. The combination, substantially as hereinbefore set forth, of two electro-magnets, and a circuit-controlling device actuated by the magnetism induced in one of said electro-magnets to reverse the circuit-connections of the other electro-magnet at each reversal in the polarity of the current transmitted through the first electro-magnet.

15. The combination, substantially as hereinbefore set forth, with an electro-magnet, of a second electro-magnet included in series therewith, and a circuit-controlling device controlled by the magnetism induced in the first-named electro-magnet for causing the magnetism induced in the second electro-magnet by means of alternating electric currents to be of constant polarity.

16. The combination, substantially as hereinbefore set forth, with a main line and an electro-magnet, of a circuit-controlling device, substantially as described, acting to reverse the connections of the coils of said electro-magnet with reference to the main line at each reversal in the polarity of the current transmitted through said main line.

17. In a printing-telegraph instrument, an oscillating armature actuated by electric currents of alternating polarity and normally polarized with a given polarity by an electro-magnet included in the circuit of the main line.

18. The combination, substantially as hereinbefore set forth, with an electro-magnet, of a second electro-magnet, a circuit-controlling device for reversing the connections of the said second electro-magnet with reference to the first-named electro-magnet, and an armature for actuating said circuit-controlling device, which armature is applied to the first-named electro-magnet, and is held in proximity to one or the other of the same by electro-magnetism, but is impelled from such position at the cessation of such magnetism.

19. The combination, substantially as hereinbefore set forth, with an electro-magnet, of a second electro-magnet, a circuit-controlling device for reversing the connections of the second electro-magnet with reference to the first-named electro-magnet, an armature for actuating said circuit-controlling device, two bands encircling the first-named electro-magnet, and constituting the poles for said armature, and serving to retain said armature in one of its positions or the other so long as said electro-magnets remain vitalized.

20. The combination, substantially as hereinbefore set forth, with an oscillating armature normally polarized by induction from an electro-magnet, of a circuit-controlling device applied to said electro-magnet, means, substantially such as described, for retaining said circuit-controlling device in one or the other of the positions which it is caused to assume, and a resilient arm caused to exert upon said armature a pressure in one direction or the other, according to the movements of said oscillating armature, and to thereby operate said circuit-controlling device when said retaining force is removed.

21. The combination, substantially as hereinbefore set forth, with an oscillating armature, E, of the levers f' f^2, the circuit-controlling device C, and the resilient arm f^3.

22. The combination, substantially as hereinbefore set forth, with two electro-magnets and an armature applied to said electro-magnets and normally polarized with a given polarity by one of the same, of two armatures respectively applied to the remaining electro-magnet, a printing platen actuated by one of said last-named armatures, and a paper-feeding device actuated by the other of said armatures.

23. The combination, substantially as hereinbefore set forth, of two electro-magnets, an armature applied thereto and normally polarized with a given polarity by one of said electro-magnets, an armature applied to the remaining electro-magnet, two type-wheels, a clutch for engaging one or the other of said type-wheels, and means, substantially such as described, for transferring said clutch through the agency of the last-named armature.

24. The combination, substantially as hereinbefore set forth, with two type-wheels and means, substantially such as described, for actuating one or the other of said type-wheels, of a type-wheel transferring device under the control of the actuating mechanism of either of said type-wheels, and means, substantially such as described, for causing said device to bring the type-wheel which is not being actuated into operation when the actuated type-wheel has been arrested in a predetermined position.

25. The combination, substantially as hereinbefore set forth, of an oscillating armature, two type-wheels, one or the other of which is

actuated by the movements of said armature, two platens respectively applied to said type-wheels, a platen-hammer which is placed in a position to engage one or the other of said type-wheels, accordingly as one or the other of said type-wheels is actuated, and an armature acting to impel said platen-hammer toward the platen beneath which it at any time stands when an impression is to be taken from one or the other of said type-wheels.

26. The combination, substantially as hereinbefore set forth, with two type-wheels and two movable platens respectively applied thereto, of a platen-hammer for impelling one or the other of said platens, an armature for actuating said platen-hammer, and means, substantially such as described, for determining the position of said platen-hammer beneath one or the other of said platens.

27. The combination, substantially as hereinbefore set forth, with a revolving type-wheel, of a stop moving with said type-wheel, a lever for engaging said stop, an arm which is caused by the revolutions of said type-wheel to engage said lever and, after a predetermined number of revolutions, to place said lever in the path of said stop.

28. A unison device for printing-telegraph instruments having two type-wheels, consisting of an arm carried upon a vertically-movable support having teeth formed thereupon, in combination with a pawl caused by the successive revolutions of either of the type-wheels to engage said teeth successively, and means, substantially such as described, for turning said arm and support into position to arrest the type-wheel which is being actuated when said arm has been moved vertically through a predetermined distance.

29. The combination, substantially as hereinbefore set forth, with two type-wheels and means, substantially such as described, for actuating one or the other of the same, of a unison device caused to intercept the path of the actuated type-wheel by the successive revolutions of the same when those revolutions are made continuously.

30. The combination, substantially as hereinbefore set forth, with two type-wheels and means, substantially such as described, for revolving one or the other of said type-wheels, of two stops respectively moving with said type-wheels, two arms respectively extending into proximity to the paths of said stops, and a unison device caused by the successive revolutions of the type-wheel which is being actuated to place one or the other of said levers in the path of the stop moving with the actuated type-wheel.

31. The combination, substantially as hereinbefore set forth, with two type-wheels and means, substantially such as described, for revolving one or the other of the same, of two stops respectively moving with said type-wheels, two detents or levers adapted to be placed in the paths of said stops, respectively, and a device for actuating one or the other of said levers, which device is placed in a position to actuate one of said levers only through the action of the device which determines which of said type-wheels is to be actuated.

32. The combination, substantially as hereinbefore set forth, with a unison device for a printing-telegraph instrument, of a releasing-armature applied to a polar extension of one of the magnets of the instrument, and means, substantially such as described, for maintaining the polarization of said extension constant.

33. A paper-feeding device for a printing-telegraph instrument, consisting of a movable section of the flat paper-guide, a pawl, means, as described, for causing said pawl to press with a constant force against the surface of said section, and a system of levers for actuating said section and pawl whenever the printing device is actuated.

34. In a paper-feeding device, the combination, with a flat paper-guide, of a movable extension thereof, through which the paper is designed to be led, a pawl, and means, as described, for causing said pawl to press with a constant force upon the surface of the paper and to advance the same whenever an impression has been taken from the type-wheel.

In testimony whereof I have hereunto subscribed my name this 13th day of December, A. D. 1883.

ROBERT J. SHEEHY.

Witnesses:
C. THOMAS BASKERVILLE,
WILLIAM H. C. ELLIS.