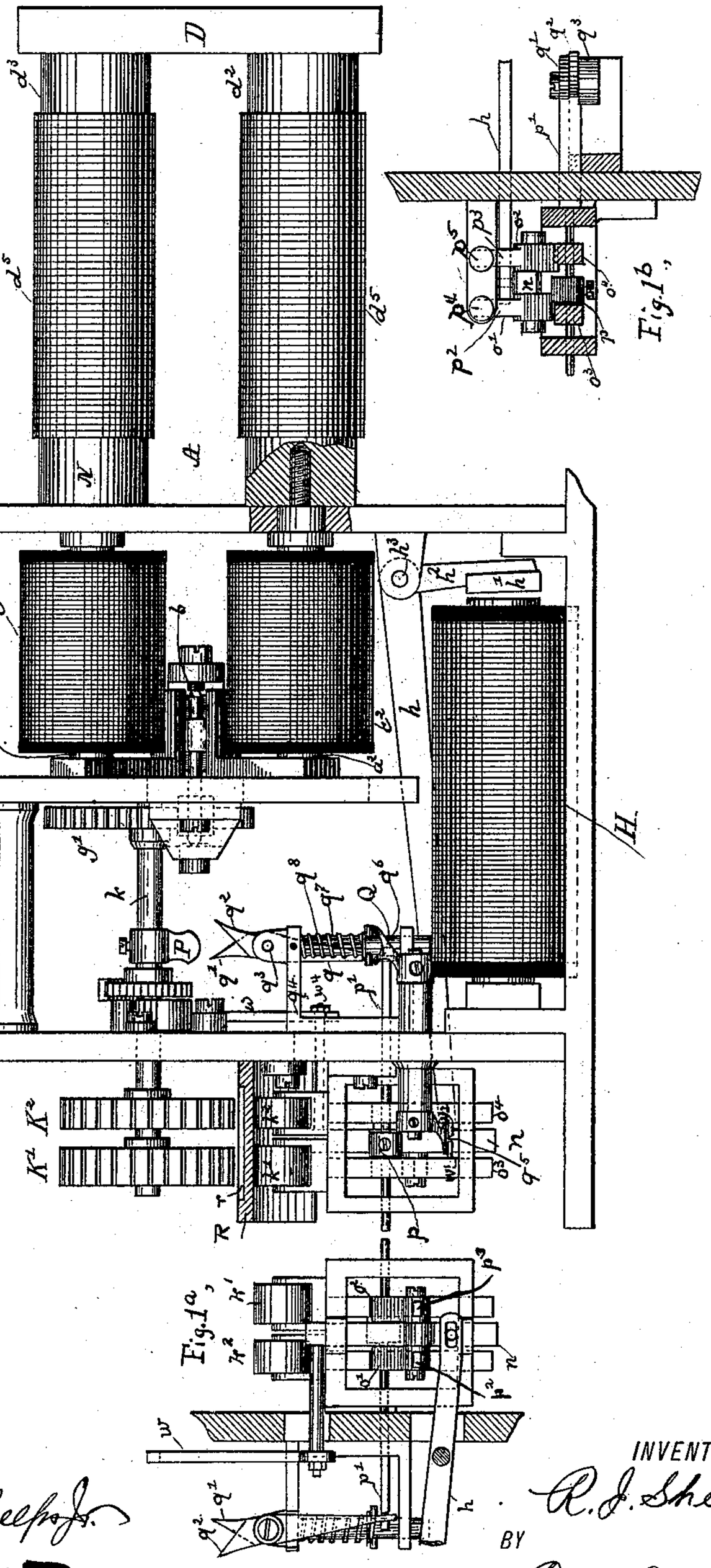
(No Model.)

4 Sheets—Sheet 1.

R. J. SHEEHY.

PRINTING TELEGRAPH.

No. 506,270. Patented Oct. 10, 1893.



WITNESSES:

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Charles A. Terry

INVENTOR

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Pope & Edgecomb

ATTORNEYS

(No Model.) 4 Sheets—Sheet 2.

R. J. SHEEHY.

PRINTING TELEGRAPH.

No. 506,270. Patented Oct. 10, 1893.

Fig. 2

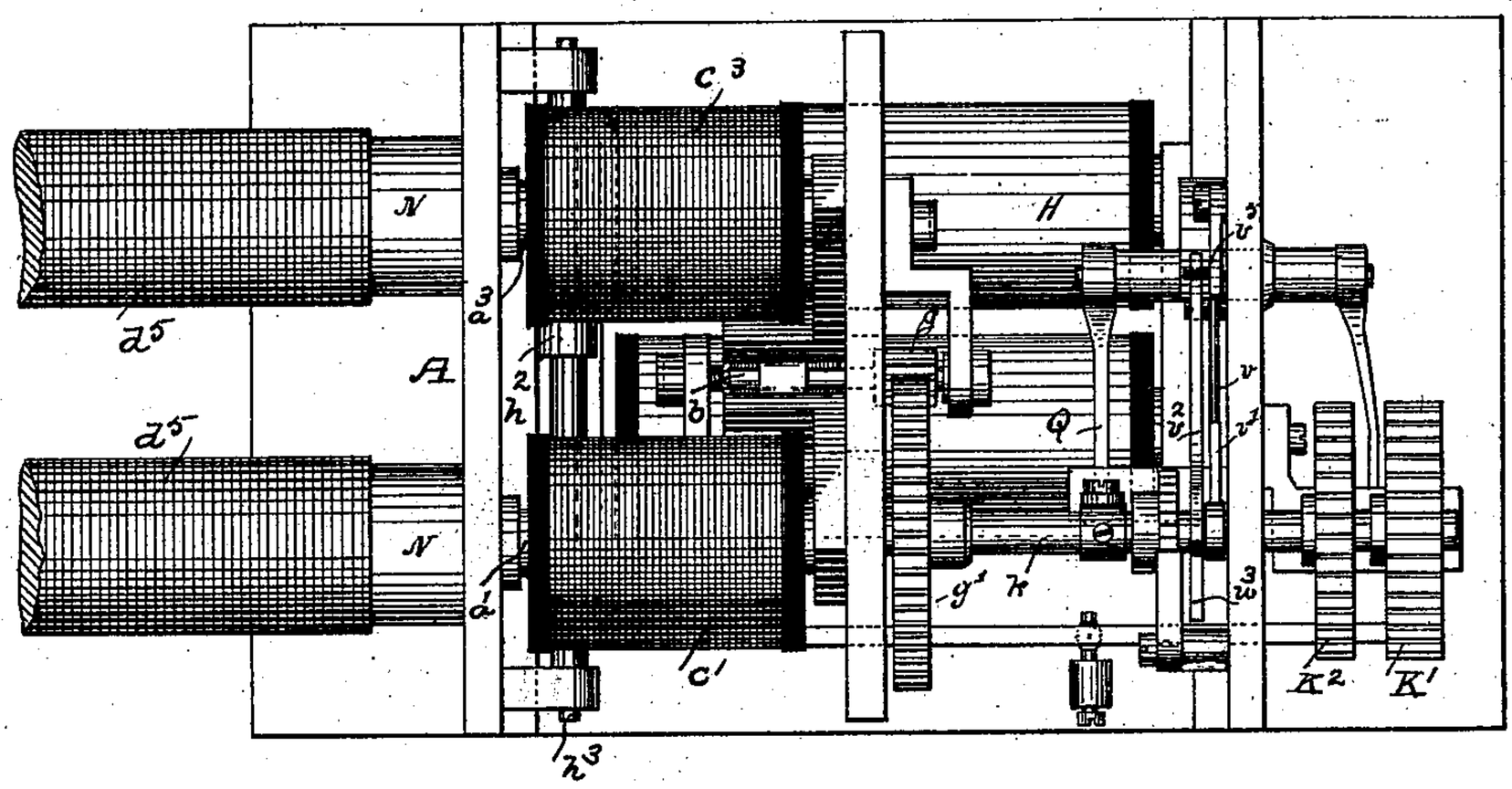


Fig. 3.

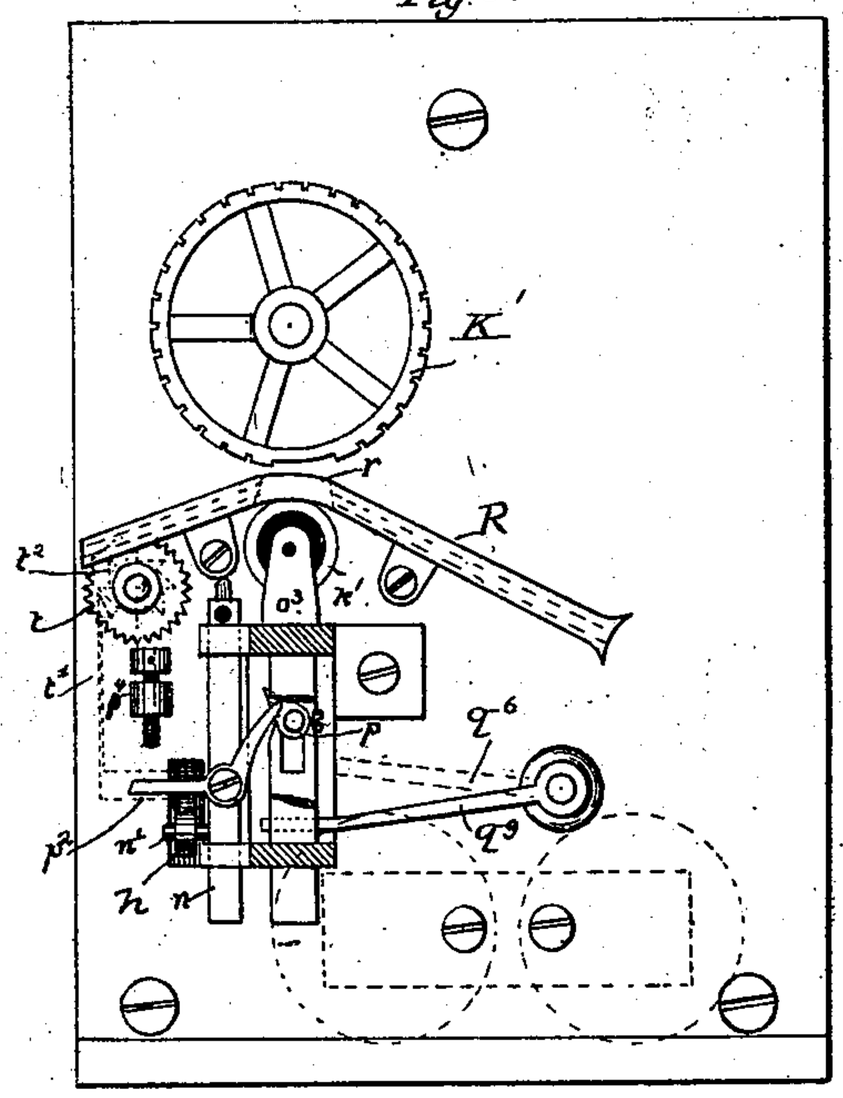
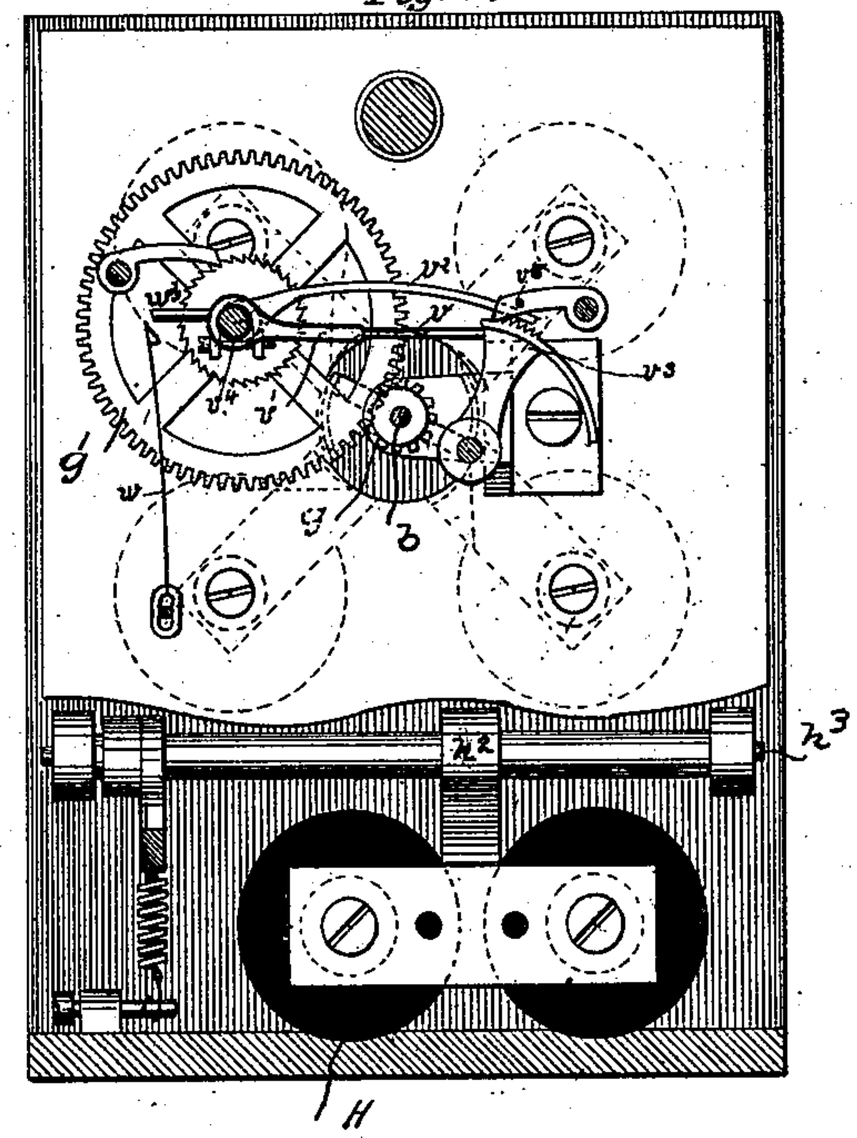


Fig. 4.



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(No Model.)

4 Sheets—Sheet 3.

R. J. SHEEHY.

PRINTING TELEGRAPH.

No. 506,270. Patented Oct. 10, 1893.

Fig. 5.

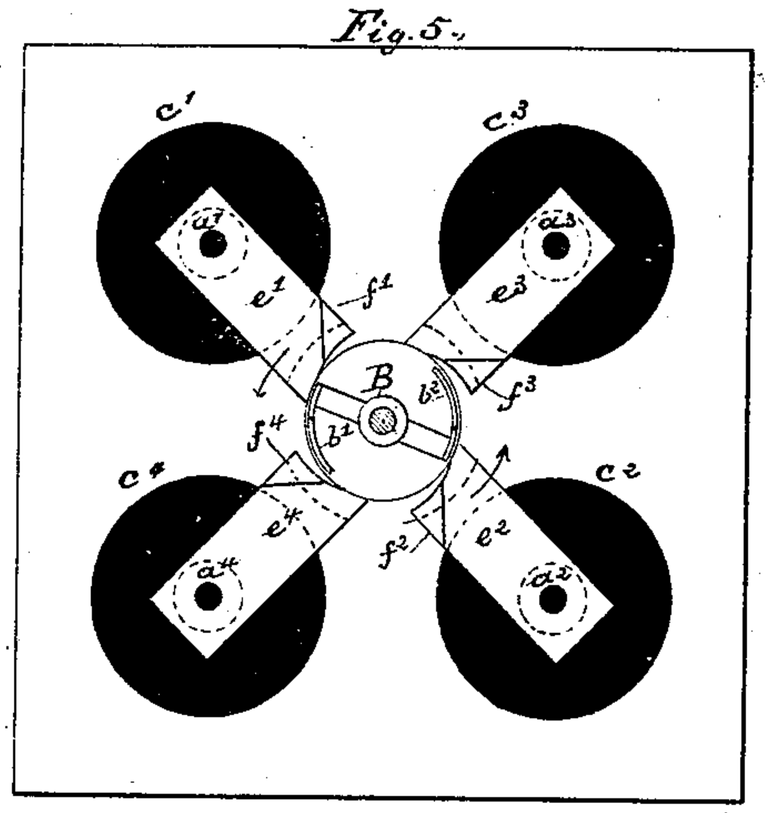


Fig. 6.

Fig. 7.

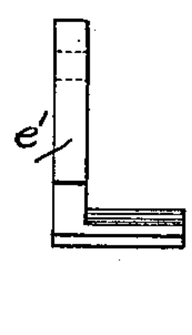


Fig. 8.

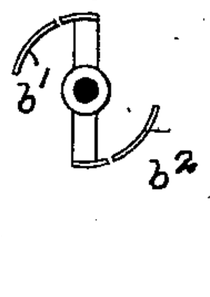


Fig. 9.

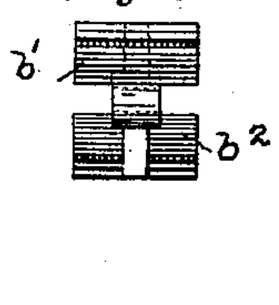
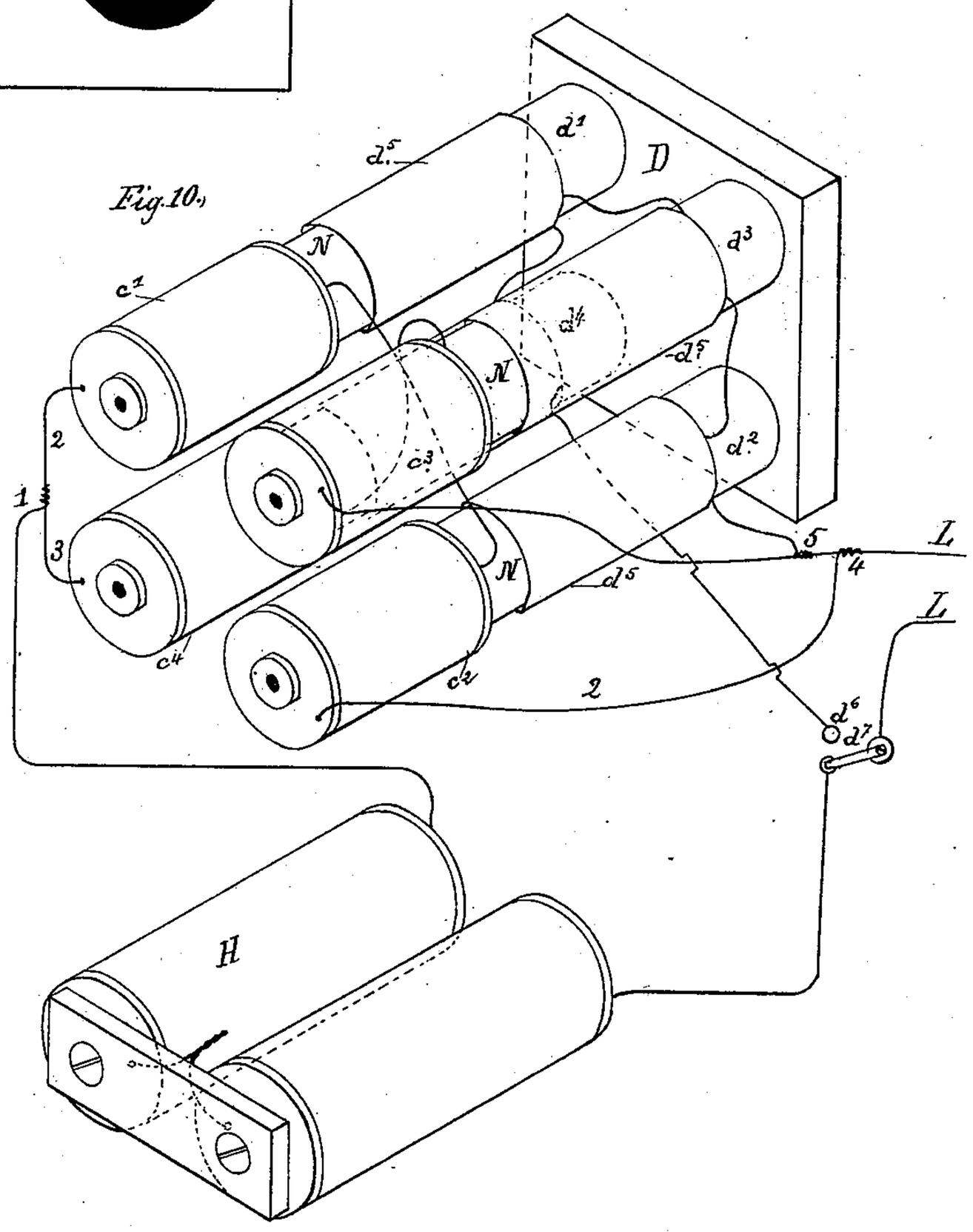


Fig. 10.



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(No Model.) 4 Sheets—Sheet 4.

R. J. SHEEHY.

PRINTING TELEGRAPH.

No. 506,270. Patented Oct. 10, 1893.

Fig. 11.

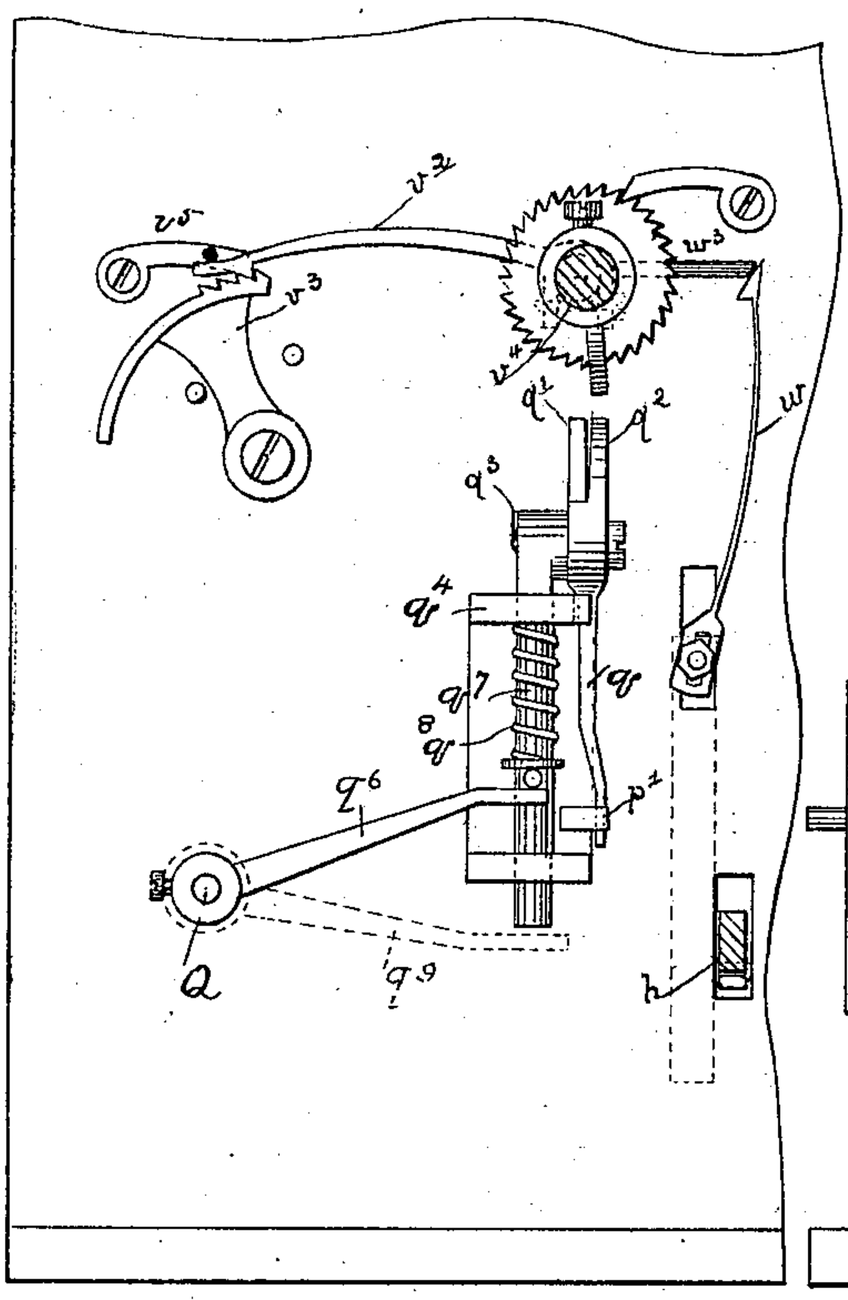


Fig. 12.

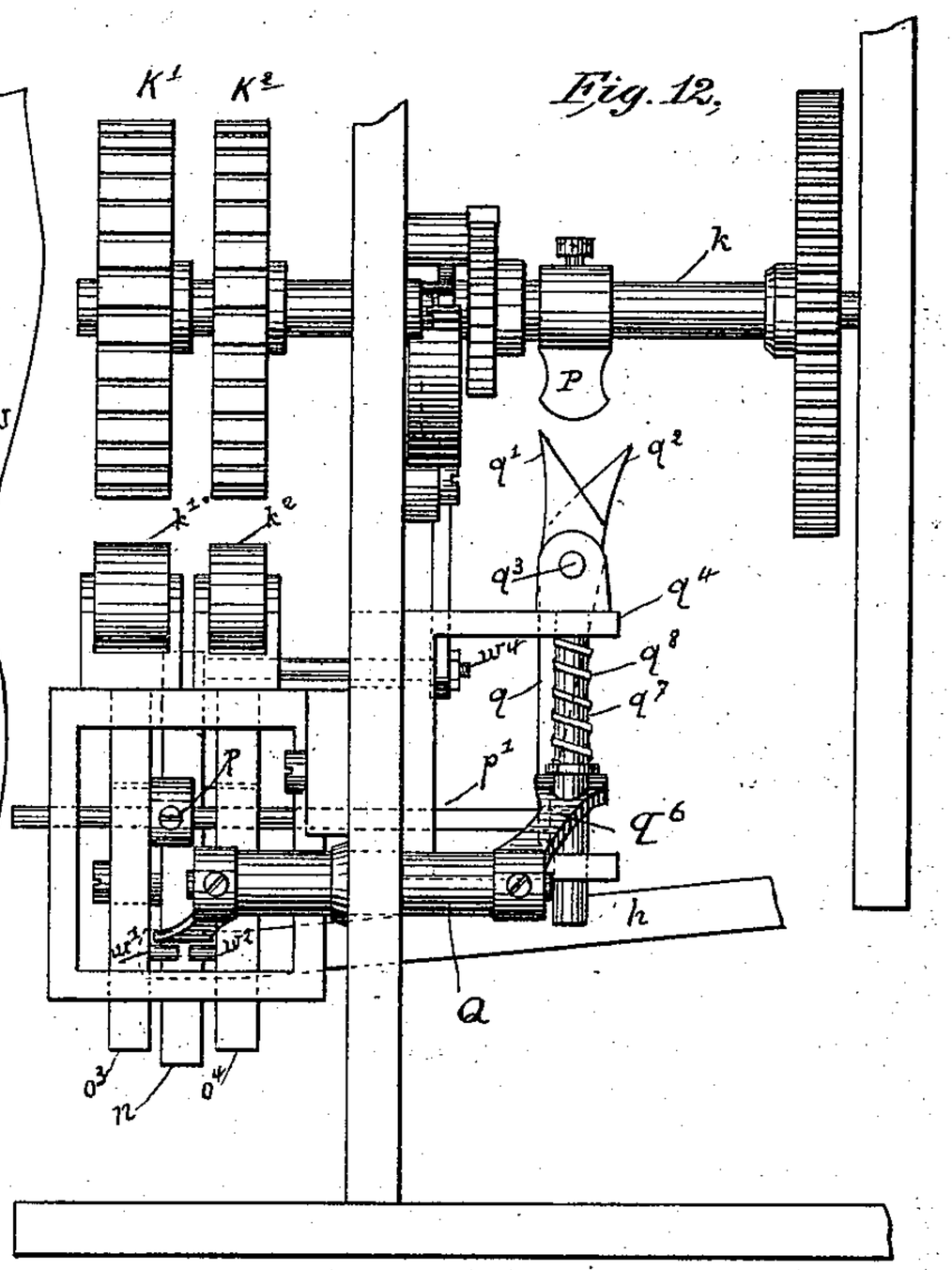


Fig. 13.

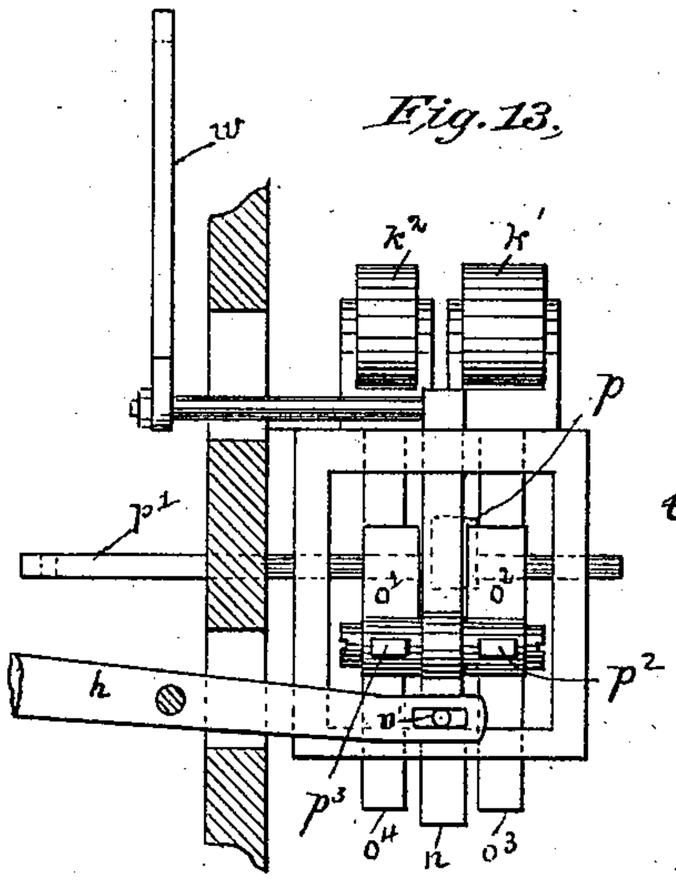
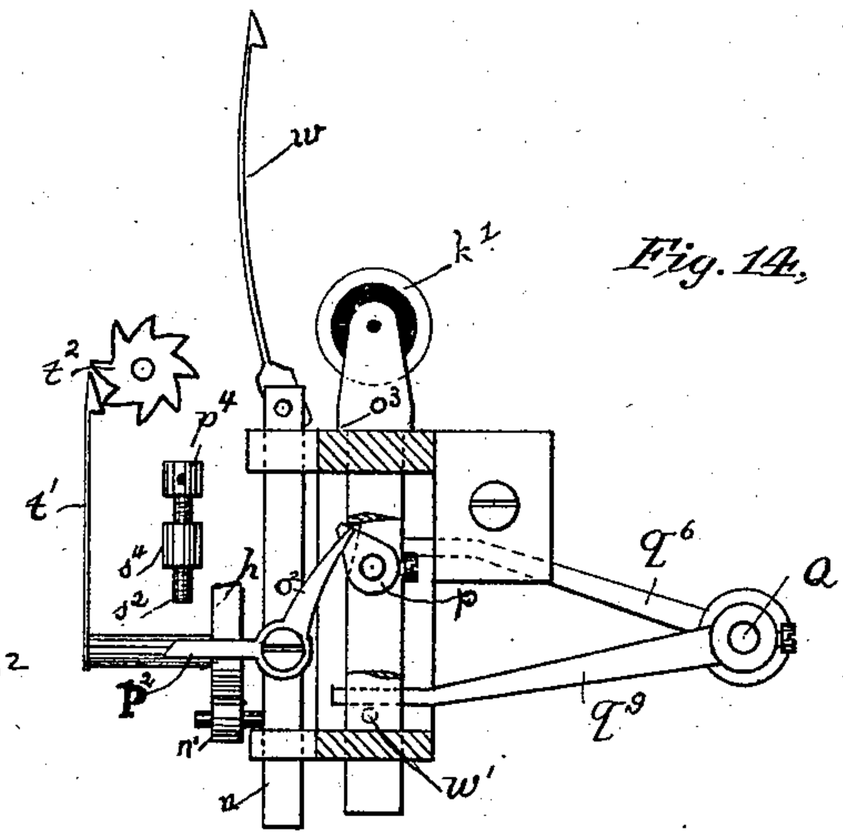


Fig. 14.



WITNESSES:
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Carrie E. Davidson

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Pope & Edgecomb
ATTORNEYS.

UNITED STATES PATENT OFFICE.

ROBERT J. SHEEHY, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO WENDELL GOODWIN, OF SAME PLACE.

PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 506,270, dated October 10, 1893.

Application filed January 10, 1887. Renewed March 15, 1893. Serial No. 466,170. (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.

The invention relates to the class of apparatus employed for printing messages and dispatchs from one or more revolving type-wheels operated by electric currents transmitted from distant points.

The general object of the invention is to provide a simple and efficient form of instrument in which the type-wheels are driven by means of an alternating current electric motor, having an armature capable of being revolved and arrested in any desired position by means of electric currents controlled from distant points.

The invention involves such an organization and certain improvements relative to the structure of the motor, the apparatus for determining from which of two wheels the impressions shall be effected, and the means for advancing the paper upon which the impressions are made bringing it into proper relation to the type-wheels.

In my Patent No. 362,322, dated May 3, 1887, there is described and shown an electric motor involving features in common with that herein described.

In the accompanying drawings—Figure 1 is a side elevation, partly in section, of a printing telegraph instrument embodying the features of the invention. Figs. 1^a and 1^b are details of the press mechanism; Fig. 2 a reversed view of the instrument; Fig. 3 a front elevation, partly in section; Fig. 4 a front view, the front plate being removed; Fig. 5 a front view of the motor itself; Figs. 6, 7, 8, and 9 are details of the field-magnet and armature of the motor; Fig. 10 a diagram illustrating the circuit-connections. Figs. 11, 12, 13, 14 illustrate in detail the platen shifting device.

Referring to the figures, a', a^2 and a^3 a^4 represent the cores of two electro-magnets for driving the armature B of the electric motor A. These cores are respectively provided with magnetizing coils c', c^2, c^3 and c^4. The cores are preferably respectively extended from permanent magnets d', d^2, d^3 and d^4 which are all supported from a single back-plate D. These permanent magnets normally tend to induce given polarities in the cores of the respective magnets, for instance the cores a' and a^2 may respectively receive north and south polarity and the cores a^3 and a^4 likewise north and south polarity.

It is designed that the coils of the respective electro magnets shall be so connected in circuit that currents simultaneously transmitted through both pairs of coils c', c^2 and c^3 c^4 will tend to increase the magnetization of one pair of the cores for instance, a' and a^2, and at the same time neutralize that of the other pair a^3 a^4. A current of the opposite polarity will increase the magnetism of the latter pair and neutralize that of the former. For this purpose the coils are preferably connected in the manner shown in Fig. 10. The main line is divided at a point 1 into two branches 2 and 3. The branch 2 leads through the coils c' and c^2, and the branch 3 leads through the coils c^4 and c^3. The two branches unite again at a point 4. The press magnet H, hereinafter to be described, is also included in the main-line circuit.

As the permanent magnets may after a time lose, to a greater or less extent, their magnetism, it may be desirable to supply them with magnetizing coils d^5, d^5, d^5, d^5 by means of which they may be re-magnetized when necessary. A convenient way of accomplishing this is to connect one terminal of these coils d^5 which are connected in series, with the main line L at a point 5, and to connect the other terminal with a contact point d^6 applied to a switch d^7, which is connected with the line L upon the other side of the instrument. By moving the switch arm d^7 upon the point d^6, the normal connections of the main line through the instrument may be interrupted and the circuit completed merely through the coils d^5. A current in the proper direction is then transmitted through the line and the magnets will be polarized, the coils being wound in the proper directions. This current may be left upon the line as long as desired.

Thus the instruments, may have their coils d^5 connected in the circuit throughout the night and a continuous current may be sent through them or if desired a current of sufficient strength to accomplish the desired result may be momentarily transmitted through these coils at any desired time.

It is designed that the armature B shall be revolved by the alternate attractions of the cores a', a^2 and a^3 a^4. The armature is preferably mounted upon an axis or arbor b supported in any suitable manner from the frame of the instrument. It is constructed with two curved forwardly extending projections b' and b^2. These projections are preferably constructed in two parts, magnetically separated from each other as shown in Figs. 5, 8 and 9. The magnetically separated projections are preferably first cut from the armature and then re-united by means of any suitable non-magnetic material. This construction is adopted for the purpose of insuring a more reliable forward movement of the armature, and a constantly increasing pull as the armature approaches more nearly to the poles of the electro-magnets.

The electro magnets are constructed with projections e', e^2 and e^3 e^4 extending from corresponding cores in a direction at right angles thereto toward the axis of the armature. The ends of these projections are curved, forming approximately a cylindrical field for the armature. The ends of the pole-pieces, however, are preferably curved in arcs eccentric from the circle described by the armature so that as the armature projections advance, they approach more nearly to the metal of the pole-pieces. The pole-pieces are also preferably constructed with magnetically separated sections f', f^2, f^3 and f^4 upon the sides approached by the armature. This construction is found to be of service in securing a constantly increasing pull upon the armature, for, when a given electro magnet begins to exert its power upon the armature, the attraction is first exerted between the magnetically detached sections of the pole-pieces and the detached portions of the armature; then, as the latter advances, they are attracted by the main portions of the pole-pieces, and finally the main body of the armature comes within the field of the main portions of the pole-pieces. The construction also insures that the armature will be arrested in a definite predetermined position provided the current employed for attracting the armature is continued after the armature has reached its point of highest attraction, that is to say, with the main portion of the armature confronting the main portions of the polar projections. When it is desired to run the instruments at very high speed the current may be increased in strength at the same time that it is so prolonged. The position in which the armature is arrested is approximately indicated in Fig. 5, with reference to the polar projections e' and e^2. The armature shaft b carries a pinion g, gearing with a wheel g' carried upon the type-wheel shaft k. The two type-wheels K′ and K² are carried upon this shaft and are respectively designed to carry numerals and letters in a manner well understood. The parts are so proportioned that, for each advancement of the armature under the influence of a current of alternate polarity, the type-wheels will be advanced a distance corresponding to one character.

For the purpose of effecting impressions from the type-wheels, two printing platens k', k^2 are employed, and these are designed to be actuated by means of a press-lever h, applied to the electro magnet H, before referred to. The armature h' of this magnet is carried upon a lever h^2 supported from the axis or shaft h^3 which carries the lever h. When the magnet H is vitalized, as for instance by a prolonged current through the line L, or by a current of increased strength, the lever h is raised. The end of the lever h is pivoted to an arm n, as shown at n', Figs. 13 and 14. This arm will thus be raised each time the press-lever is actuated. The arm n, carries two pawls o' and o^2 designed to engage the respective supports o^3 and o^4 of the printing-platens, by entering corresponding notches therein, but, as it is desired that only one platen shall be actuated at a time, a shifting block p is employed for covering the one or the other of the notches in the respective platen supporting rods, accordingly as it is desired to actuate the platen k^2 or k'. The pawls extend beyond the inner sides of the supports o^3 and o^4 far enough to be engaged by the block p, which is located between the supports. This block is carried upon an arm p' which is moved in a direction parallel to the type-wheel shaft by means of a shifting device operated by a block P carried upon the type-wheel shaft k. It is designed that the rod p' shall be moved in one direction when the type-wheels are arrested in a given position and the press-lever is actuated, and that it shall be moved in the opposite direction when the type-wheels are stopped in a second given position and the press-lever is actuated. For this purpose two beveled shaped arms q' and q^2 are carried upon the arm q which is coupled at its lower end with the arm p'. This arm q is pivoted at q^3 to a vertically movable rod q^7 passing through a bracket q^4. The block P is rounded at its end, and if the shaft k be arrested with the block in a proper position to engage the arm q', it will operate the lever q toward the right hand, in Figs. 1 and 12; if, however, the lever h is actuated when the block on shaft k is in position to engage the beveled arm q^2 it will turn the lever q toward the left hand. Preferably the two or more places in which the type-wheel shaft is arrested for this purpose are such that one or the other of the two blank places upon the type-wheels will be above the platens. The platen-shifting lever q is preferably actuated by means

of a rock-shaft Q which turns in suitable bearings. This shaft at one end carries an arm q^9 engaged by one or the other of two pins w' and w^2, which extend from the supports o^3 and o^4. When either of these supports is actuated, the rock-shaft is turned and a second arm q^6 extending therefrom engages the rod q^7 carrying the support of the lever q, thus raising it, and forcing the arms q' and q^2 toward the type-wheel shaft. A spring q^8 normally serves to press the rod q^7 downward, and thus return the rock-shaft to its normal position. The paper is fed forward through a shield or guide R. This consists of a bent flattened tube open at r, beneath the type-wheels, a sufficient width to allow the platens to press the paper against one or the other of the type-wheels.

For the purpose of preventing the platens from clinging to the type-wheels, after the impressions are effected, it is preferred to release them the moment the impression is made. For this purpose the pawls o' and o^2 are respectively provided with extensions p^2 and p^3 which make contact with corresponding stops p^4 and p^5 which serve to throw them out of engagement with their corresponding platen supports the moment an impression is effected, thus allowing the support to drop and carry the platen away from the type-wheel. The paper is fed forward after each impression by means of a toothed wheel t, engaging or pressing against the under surface of the paper as shown in Fig. 3. When the lever h falls a spring-pawl t' engaging the teeth of a ratchet wheel t^9 upon the arbor of the toothed wheel, serves to advance the wheel the proper distance.

The unison of the type-wheel is effected by means of a stop v, Figs. 2 and 4, which is moved step-by-step into the path of the arm v', carried upon the type-wheel shaft, by means of a pawl v^2 that engages the successive teeth of a segment v^3 and is driven to-and-fro by an eccentric v^4 upon the type-wheel shaft. Any predetermined number of revolutions will serve to bring the stop into the path of the arm and arrest the type-wheel shaft in a predetermined position.

For the purpose of releasing the unison device, an arm w, Fig. 4, carrying a spring-catch, rises with the press-lever, being secured to the rod n that carries the pawls o', o^2 as shown at w^4 Figs. 1, 12 and 13. This spring-catch engages an extension w^3 upon the pawl v^2, and when the support of the platen-actuating pawls is released, the spring-catch serves to raise the pawl v^2 and also the dog v^5 out of engagement with the segment v^3, thus allowing the unison device to return to its normal position by gravity, or by means of a spring. This form of unison device is essentially the same as that described in Letters-Patent No. 334,294, granted to me January 12, 1886.

I claim as my invention—

1. The combination, of a pair of electro-magnets having normally polarized cores, soft iron extensions of said cores, a rotating armature actuated by said electro-magnets, a type-wheel shaft having one or more type-wheels, mechanism for driving the type-wheel shaft from the rotary armature and means for effecting impressions therefrom.

2. The combination with a pair of electro-magnets of one or more polarizing magnets applied to the cores of the same, an armature actuated by said magnets, a type-wheel shaft driven by said armature, one or more type-wheels upon said shaft and means for effecting impressions from the same.

3. The combination with a pair of electro-magnets of polarized magnets extending from the respective cores of the same, a back plate common to all of said polarized magnets, an armature actuated by said electro-magnets, a typewheel shaft driven by said armature, one or more type-wheels upon said shaft and means for effecting impressions from said type-wheel.

4. The combination, in a printing telegraph instrument, of a single main line and a rotary alternating-current electric motor, whose rotation is dependent in extent upon the number of alternations of current passing through it, said motor having field-magnets all of whose coils are permanently connected in the line when the instrument is working, and a revolving armature common to all the poles of the field magnets, and rotated by the alternations of polar conditions due to alternations of currents in the field-magnet coils, with one or more type-wheels rotated by the revolving armature, and means for taking an impression from the type-wheels.

5. The combination with two or more electro-magnets, of polarized magnets carrying the respective cores of the same and inducing therein given polarities, means for transmitting currents through said electro magnets and increasing the normal magnetization of the one pair of cores and decreasing that of the other and vice versa, an armature revolved by the alternate increase and decrease in the magnetization of said cores and a type-wheel shaft and type wheel revolved by the action of said armatures.

6. The combination with a printing telegraph instrument, of an electric motor for actuating the same, consisting of a rotary armature, electro-magnets applied thereto and polarized magnets applied to the electro-magnets, and mechanism for driving the type-wheel shaft of the printer from the rotary armature.

7. In a printing telegraph instrument the combination with an electric motor having electro-magnets and a revolving armature for advancing the type-wheel shaft, of one or more permanent magnets applied to the cores of said electro-magnets and magnetizing coils for said permanent magnets, substantially as described.

8. In a printing telegraph instrument, the combination of an electric motor having elec-

tro-magnets and a revolving armature for advancing the type-wheel shaft, permanent magnets applied to the respective cores of said electro-magnets, magnetizing coils for said permanent magnets, and means for placing said coils in circuit with the main line of a telegraph system, substantially as described.

9. The combination with the type-wheel shaft and two type-wheels of a printing telegraph instrument, of a shifting device consisting of a block moving with the type-wheel shaft, two oppositely arranged inclined surfaces q' q^2, an arm or support on which they are mounted movable toward the type-wheel shaft to cause one or the other to engage said block accordingly as the type-wheel shaft is arrested in one or the other of two given positions, and a rock shaft for moving said arm or support having an arm extending into engagement with two platen supports one or the other of which is actuated by the press-lever of the instrument.

10. The combination of two type-wheels, a shaft carrying the same, two printing platens for effecting impressions therefrom, independently movable supports for said platens, a press-lever and arm carried thereby, pivoted pawls carried upon said arm for engaging one or the other of said supports, and a shifting block for placing either of the pawls out of engagement with its support, substantially as described.

11. The combination with the two type-wheels and a shaft carrying the same, of a press lever, a platen, a rod supporting the same, a pawl actuated by the press-lever engaging said rod, and a stop engaging an extension of said pawl and throwing it out of engagement with said rod when the platen has been thrust against the type-wheel, substantially as described.

12. In a printing telegraph instrument the combination of a type-wheel shaft and two type-wheels carried thereby, two platens for effecting impressions therefrom, pawls for actuating one or the other of said platens, a shifting block for preventing the engagement of either one or the other of said pawls with its platen, the vertically movable rod q^7 actuated simultaneously with said pawls, the beveled-faced arms carried by said rod, a connection between said arms and said shifting block and the block P carried upon the type-wheel shaft for engaging said beveled faced arms.

13. The combination of two type wheels, their shaft, independently movable platen supports, one for each type-wheel, the press lever, an independent device for actuating each platen support by the movement of the press lever, a shifting block (p) for throwing one or the other of the platen actuating devices out of action, and means for operating the shifting block in one direction or the other according to the position in which the type-wheel shaft is arrested, substantially as set forth.

14. In a printing telegraph instrument, the combination with a press-lever, of two platens, rods carrying the same, pawls engaging said platen rods, a support carrying said pawls engaged by said press-lever and a paper feeding device consisting of a spring-catch secured to said pawl-supporting rod, and a toothed wheel engaged by said catch, substantially as described.

15. The combination of electro-magnets having polarized cores, an armature actuated by said magnets, a type-wheel shaft, one or more type-wheels carried thereby and means for effecting impressions therefrom.

In testimony whereof I have hereunto subscribed my name this 8th day of January, A. D. 1887.

ROBERT J. SHEEHY.

Witnesses:

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CAROLINE E. DAVIDSON.