(No Model.) 2 Sheets—Sheet 1.

R. J. SHEEHY.

PRINTING TELEGRAPH.

No. 368,858. Patented Aug. 23, 1887.

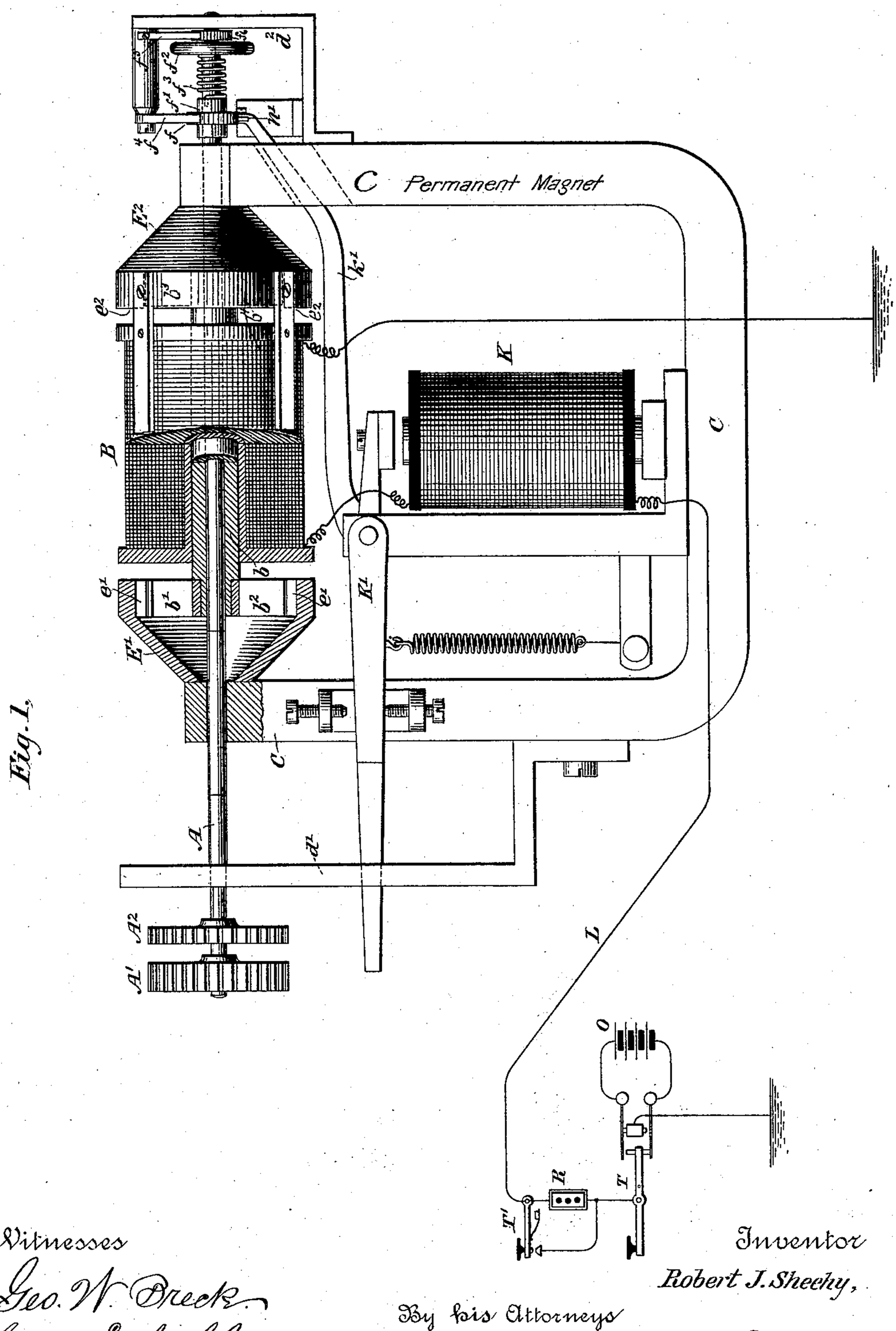

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2,

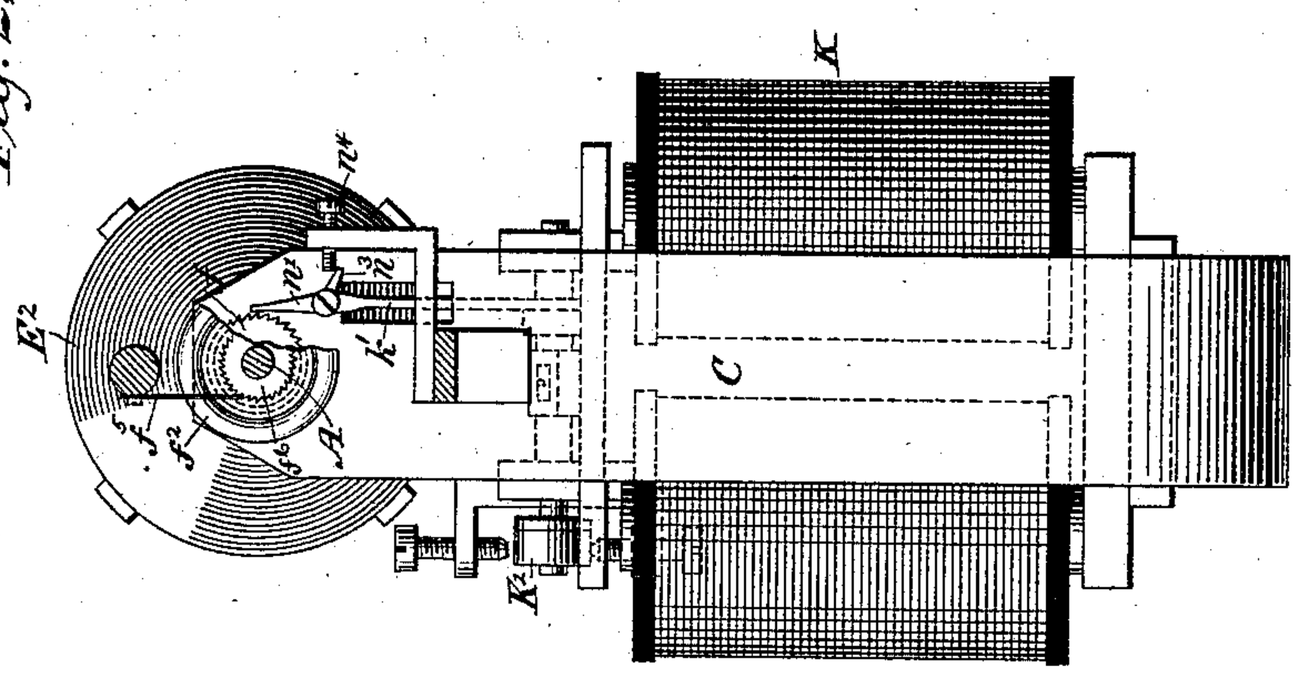
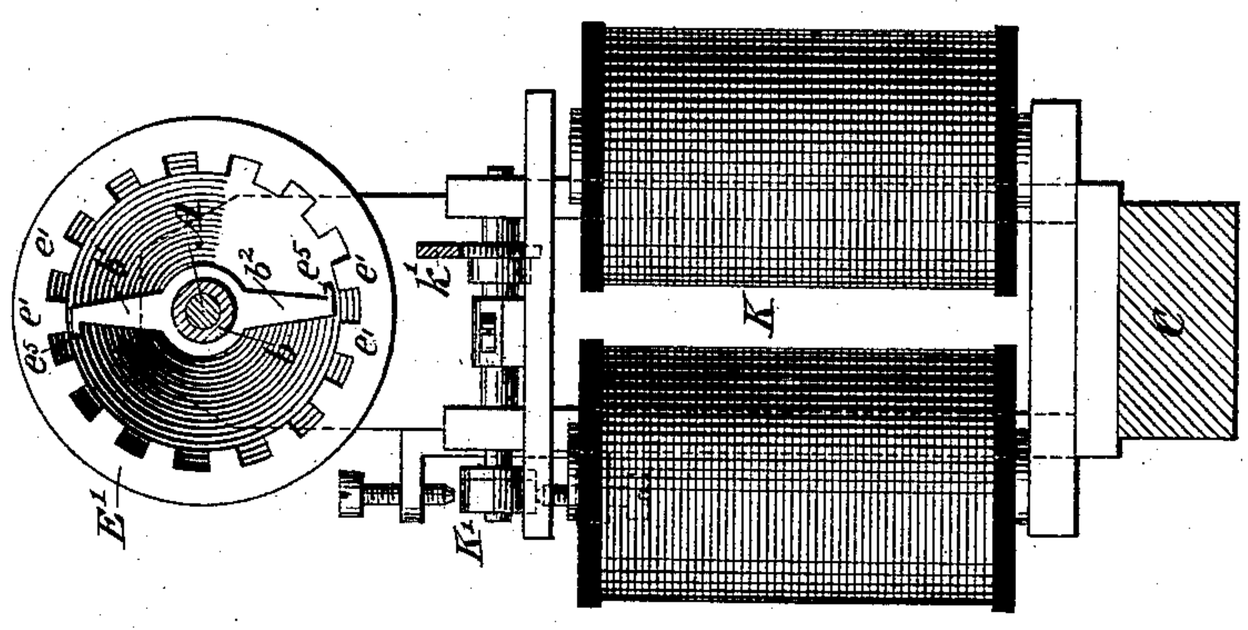


Fig. 3,



Witnesses
Geo. W. Breck.
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By his Attorneys
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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. 368,858, dated August 23, 1887.

Application filed March 11, 1886. Serial No. 194,769. (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 apparatus employed for printing messages from one or more type-wheels capable of being revolved by electric currents transmitted from a distant point.

The invention has for its object to provide an instrument capable of being actuated by currents transmitted over a single main line and to effect impressions from either of two type-wheels through the agency of two electro-magnets, the one being employed for controlling the positions of the type-wheels and the other for effecting the impressions.

The invention consists in supporting within a hollow coil or helix of insulated wire a movable core carrying at its respective ends two oppositely-projecting arms of soft iron, which receive their polarization from the core of the electro-magnet and act upon polar projections of a permanent magnet applied thereto. The shaft of the type-wheel is preferably connected directly with the core of the magnet and revolved by the movements of that core. The arms or polar projections are alternately attracted by the polar projections of the permanent magnet, and each reversal of current and consequent reversal of the polarity of the core occasions an advance movement of the type-wheel shaft through a predetermined distance, preferably a distance corresponding to one type of the type-wheel. The special form of the extension of the permanent magnet will be fully described in connection with the drawings.

Preferably impressions are effected from the type-wheel by means of a lever operated by a press-magnet included in the circuit with the type-wheel-controlling magnet. Any suitable means may be employed for determining from which type-wheel an impression shall be effected.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of an instrument embodying the features of the invention. Fig. 2 is a front view, also partly in section, and Fig. 3 is a section of the instrument.

Referring to the figures, A′ and A² represent two type-wheels carried upon a shaft, A. This shaft carries the core *b* of an electro-magnet, B. The shaft has its bearings in the two arms or ends of a permanent magnet, C, and also in two brackets, *d′* and *d²*, attached to the permanent magnet. It is preferably of non-magnetic material, and supports the soft-iron core *b*, which is movable within the coil B′. At one end of the core there are carried two arms, *b′* and *b²*, and at the other end two arms, *b³* and *b⁴*. The arms *b′* and *b²* at one end are designed to be alternately attracted by projections *e′ e′* of a conical extension, E′, of the permanent magnet C, and in like manner the arms *b³* and *b⁴* are alternately attracted by similar projections of an extension, E², at the other pole of the permanent magnet. The extensions E′ and E² are of soft iron, and the number of inwardly-projecting extensions or lugs *e′ e′* at each end is preferably one-half as great as the number of type upon either type-wheel.

The parts are so organized that when one arm, *b′*, is opposite a projection, *e′*, the other arm, *b²*, will be opposite a space between two projections, *e′ e′*, and likewise with reference to the arms *b³* and *b⁴* and the projections *e²* of the extension E². The arms are constructed with forwardly-projecting extensions *e⁵*, as this construction is found to secure a better action of the instrument. In width they slightly exceed the width of the projections *e′*. It will be evident that the extension E′ will be of one polarity and the extension E² of the opposite, by reason of the magnetic induction from the poles of the magnet C, with which they are in contact.

A ratchet-wheel, *f*, is secured to a sleeve, *f′*, carried upon the shaft. A spring, *f³*, connects this sleeve with a balance-wheel, *c²*, loosely surrounding the shaft. When the shaft is being revolved, a pawl, *f⁴*, by engaging the teeth of the ratchet-wheel, prevents a retrograde movement, and when the shaft is arrested the momentum of the balance-wheel will cause the spring to be wound slightly, and a pawl, *f⁵*, applied to a ratchet-wheel, *f⁶*, secured to the wheel, will hold it under slight tension until it is again started. The spring will thus assist in starting the shaft the moment the arma-

ture is released by interrupting or reversing the current. This insures a quick action of the type-wheel shaft. An additional device applied to the press-lever for still further assisting in starting the shaft will be described in connection with the press mechanism.

For the purpose of effecting impressions from the type-wheels, a press-magnet, K, is employed. This is preferably included in the same circuit with the coil B′, and it may be constructed to respond to currents of increased strength or prolonged currents, as desired. The press-magnet is preferably carried upon a support secured to the permanent magnet C at a central point, as shown, and it extends upward beneath the coil B. This magnet acts upon a lever, K′, designed to operate the printing-platens in any convenient manner. There is secured to the lever K′ of the press-magnet an arm, *k′*, carrying at its extremity a pawl, *n′*, designed to engage the ratchet-wheel *f*, carried upon the type-wheel shaft. When the press-magnet is vitalized and its armature drawn downward, the pawl *n′* is drawn forward over the teeth of the ratchet-wheel. When, however, the press-magnet is demagnetized and its armature is released, the arm *k′* rises and through its pawl *n′* gives a forward impulse to the armature and type-wheel shaft.

The pawl *n′* is constructed with an arm or tail-piece, n^3, which strikes against an adjustable screw, n^4, when it is desired to throw the pawl out of adjustment with the ratchet-wheel. This construction is desirable, for otherwise the excursion of the press-lever might be such as to advance the type-wheel shaft too great a distance.

In the drawings there is shown a theoretical diagram illustrating the method of transmitting the proper currents for operating the instrument. In this diagram, T represents a pole-changing key of any suitable character adapted to transmit alternating impulses from a battery, O, upon the main line L, which is connected through the coil B and the press-magnet K. By operating the key T alternating impulses will thus be sent, which serve to revolve the type-wheel shaft. For the purpose of effecting impressions a prolonged impulse may be sent, or an artificial resistance, R, normally included in the circuit, may be shunted by means of a key, T′.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of a stationary magnetizing-coil, a movable core within the same, a permanent magnet, polar extensions thereto forming annular fields, and polar extensions of said core within said fields advanced step by step by reversals of currents through said helix, substantially as described.

2. In a printing-telegraph instrument, a type-wheel shaft, an electro-magnet having a revolving core upon said shaft, fixed polar fields applied to said core, and extensions to said core acted upon by said fields.

3. In a printing-telegraph instrument, a motor-armature upon the type-wheel shaft, means for reversing the polarity of the armature, and a fixed field for the armature.

4. The combination, substantially as hereinbefore set forth, of a type-wheel shaft, an electro-magnet having a revolving core, permanent magnetic fields applied to said core for advancing the same step by step by the successive reversals in the polarity of the core, and a press mechanism for effecting impressions.

5. The combination, substantially as hereinbefore set forth, with a type-wheel shaft, a type-wheel carried thereby, and a printing device for effecting impressions therefrom, of a single-coil electric motor having a rotating armature for revolving the same.

6. The combination, substantially as hereinbefore set forth, with a type-wheel shaft, of a soft-iron core upon said shaft, and a permanent field-magnet applied to said core, and a magnetizing-coil for reversing the polarity of said core.

7. The combination, substantially as hereinbefore set forth, of a type-wheel shaft; a rotary motor armature, means for reversing the polarity of the same, a permanent field-magnet applied to said armature, and means for preventing a retrograde movement of said shaft.

8. In a printing-telegraph instrument, an actuating-motor consisting of a revolving core, radial arms applied thereto, a permanent field-magnet applied to said arms, having a series of polar projections which successively act upon said arms to revolve the core when the polarity of the core is alternated, and means for so alternating the polarity of the core, substantially as described.

9. In a printing-telegraph instrument, an electro-magnet having a revolving core, oppositely-projecting arms or extensions of said core, a series of polar projections constituting a field for said arms so located that when one of said arms is opposite a projection the other is opposite a space between two projections, and means for reversing the polarity of said core.

10. The combination, substantially as hereinbefore set forth, of a type-wheel shaft, a permanent magnet, polar extensions having a series of inwardly-projecting lugs conical in form at each pole of said magnet, a magnet having a movable core, and arms carried upon said core and alternately acted upon by the projections to revolve the type-wheel shaft.

11. The combination of the electro-magnet C, having the polar extensions E′ and E^2 and the inwardly-projecting lugs *e′ e′* and e^2 e^2, together with the armature-core and surrounding helix and the type-wheel shaft, substantially as described.

12. The combination of a type-wheel shaft, a soft-iron core upon said shaft, radial arms upon said core, means for revolving the core step by step by the alternate action of said arms, a press-magnet and a press-lever, a ratch-

et-wheel carried upon the type-wheel shaft, an arm moving with said press-lever, and a pawl carried upon said arm and engaging said ratchet-wheel and turning it forward upon the movement of the armature away from the electro-magnet.

13. The combination, substantially as hereinbefore set forth, of a type-wheel shaft, means for revolving the same step by step, a ratchet-wheel carried upon said shaft, a press-magnet and its lever, and a pawl moving with said lever and engaging said ratchet-wheel and advancing the same upon the movement of the lever away from the press-magnet.

14. The combination, substantially as hereinbefore set forth, of a type-wheel shaft, means for revolving the same step by step, a ratchet-wheel moving with the type-wheel shaft, an impression device, a pawl applied to said ratchet-wheel and advanced when said impression device is actuated and released when said impression device is released, thereby tending to revolve said type-wheel shaft, and an adjustable tripping device applied to said pawl and serving to throw it out of engagement with said ratchet-wheel at a predetermined point in its movement.

In testimony whereof I have hereunto subscribed my name this 18th day of February, A. D. 1886.

ROBERT J. SHEEHY.

Witnesses:
DANL. W. EDGECOMB,
CHARLES A. TERRY.