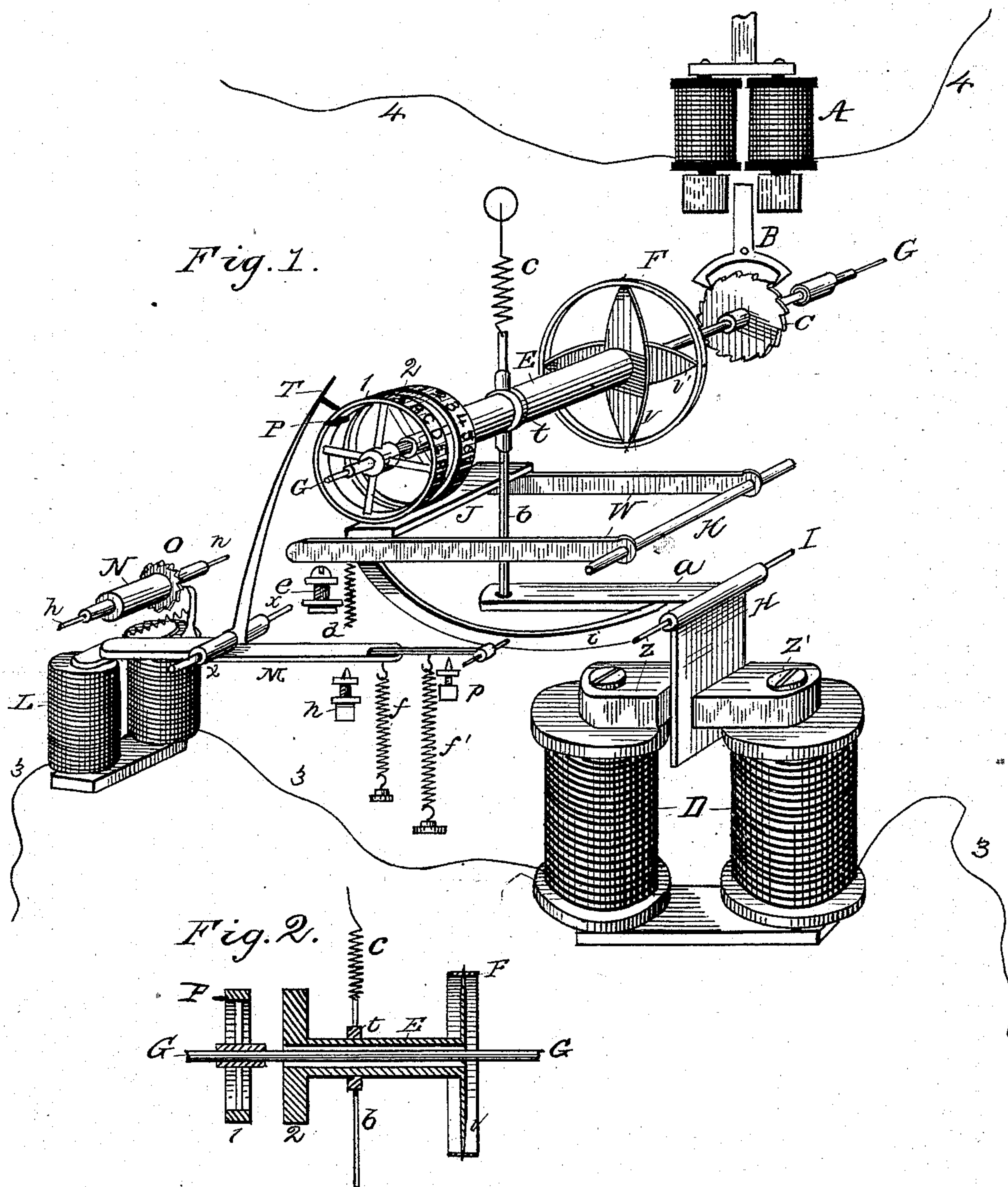


(No Model.)

S. D. FIELD.  
PRINTING TELEGRAPH.

No. 274,748.

Patented Mar. 27, 1883.



WITNESSES

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# UNITED STATES PATENT OFFICE.

STEPHEN D. FIELD, OF NEW YORK, N. Y.

## PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 274,748, dated March 27, 1883.

Application filed March 3, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN D. FIELD, of New York, in the county of New York and State of New York, have invented a new and  
5 useful Improvement in Printing-Telegraphs; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked  
10 thereon.

My invention relates generally to that class of printing-telegraphs in which two type-wheels are used, arranged to print in parallel lines upon one fillet or band of paper, the wheels  
15 being propelled "step by step" by a magnetic escapement, and in which a tendency to constant rotation, given by a motive power to the shaft carrying the type-wheels, is changed to an intermittent or step-by-step motion, so that  
20 each character may be positioned in rotation to be printed from.

It especially relates to the means for determining at will which one of two type-wheels shall be printed from at any particular time,  
25 to the means for feeding the paper band or fillet after an impression thereon, and to the means for securing correspondence of action, or "unison," as it is generally termed, between one or more instruments in circuit and the  
30 transmitter.

In carrying my invention into practice a motive power is applied to the shaft carrying the type-wheels, and an electro-magnetic escapement is used, regulating the stress of the  
35 motive power upon the shaft in the well-known manner. Upon the shaft one type-wheel is rigidly or directly mounted, while the second type-wheel is upon a sleeve somewhat larger than the shaft, and connected thereto by a  
40 compass-gimbal attachment, so as to be caused to rotate therewith, and yet have a play vertically thereon. Loose upon the sleeve is a collar, within which the sleeve may rotate, and having a spring normally pulling the sleeve  
45 up as far as the difference in diameter of the shaft and sleeve permits, so that the upper and lower edges of the two wheels are in different planes, the second named, or the one on the sleeve, being normally raised above the  
50 other. The platen or press is carried by an

independent frame having a spring or other retractor to keep it normally away from the wheels. Underneath this frame, and adapted to strike thereon and lift it up, takes an arm  
55 from the armature of the press-magnet, which is a polarized electro-magnet, to the end that, as the armature is attracted to one pole, the arm may lift the platen to one wheel, but when attracted to the other pole the second wheel  
60 may be pulled down to the platen, which then remains stationary. In the press-magnet circuit is placed a second magnet—an ordinary electro-magnet—which controls the unison and paper-feed devices. The printing-circuit is to  
65 be kept normally charged to a small per cent.—say ten to twenty per cent.—of the normal printing-current, the springs or other retractors connected with the printing mechanism  
70 being so adjusted that the magnetism due to this small per cent. of current shall not be sufficient to overcome their resilience. The armature-levers of this second magnet have a spring  
75 of such low resilience that its effect is overcome by the magnetism due to the small normal charge. It carries a pawl engaging with a ratchet on a wheel over or under or around  
80 which the paper passes, and it carries also a hooked arm adapted to contact with a unison-stop on one of the type-wheels, or on some member of the type-wheel train wherein the  
85 circuit is entirely broken. The free end of this armature-lever takes under a free end of a lever having a strong retractile spring so acting, in effect, as a stop while the magnet is only  
90 weakly charged. Ordinarily the magnetism due to the weaker charge attracts its armature till stopped by the stronger spring. This is sufficient to keep the unison-arm out of operation. Upon full charging, the armature is attracted the full distance, carrying the pawl  
95 into engagement with a fresh ratchet-tooth on the paper-feed, and so operating it upon withdrawal of the printing-current. Upon an entire break in the circuit the armature is drawn away entirely by its spring and the unison  
100 brought into action. This construction will be better understood by reference to the drawings, in which—

Figure 1 is a view in perspective of a printing telegraphic apparatus embodying my in-



vention, and Fig. 2, a view in section of the type-wheel shaft and sleeve carrying the second type-wheel.

4 4 is the main escapement-circuit, in which is located the polarized electro-magnet A, whose armature B is formed into an anchor taking in the escapement-wheel C, mounted on shaft G, and forming an electro-magnetic escapement regulating and controlling the action of any suitable prime motor (not here shown) on the shaft.

1 2 are two type-wheels, 1 being mounted directly and rigidly upon the shaft. The wheel 2 is mounted upon a sleeve, E, somewhat larger in diameter than the shaft. This sleeve is attached to the shaft by the compass-gimbal attachment F, so that it and its type-wheel are caused to rotate with the shaft, while a certain amount of motion is permitted to the sleeve in a direction at right angles to the line of the shaft. The construction of the compass-gimbal attachment enables this to be done. In it the arm *v* is attached to the sleeve E, and its ends pass loosely through the slots or apertures in the ring or band, while the arm *v'* is attached to the shaft, and at its ends passes loosely through the band at right angles to *v*. For the purpose of distinguishing these wheels, wheel 1 will be termed the "rigid" type-wheel and wheel 2 the "loose" type-wheel.

*t* is a collar passing loosely around the shaft, and within which the shaft is permitted to rotate. Attached to this collar is a spring, *c*, whose stress tends normally to pull the sleeve up to its limit of motion, lifting wheel 2 so that its lower edge is in a higher plane than is the lower edge of 1.

From the lower side of the collar *t* depends a strap, rod, or cord, *b*, attached at its lower end to an arm, *a*, of the armature H of the press or printing magnet D, which is a polarized magnet in a printing-circuit, 3 3. Another arm, *i*, projects from the same armature, and is arranged to take under some portion of the frame W, which carries the platen J, located beneath the type-wheels 1 2, the frame having an axis, K, journaled in suitable supports. A spring, *d*, is attached to the frame and holds it normally from contact with 1 2, while a stop, *e*, limits its backward movement due to *d*. The springs *c d* are adjusted so as to have about equal degrees of resilience and a degree requiring about the full power of the magnet D to overcome.

In the printing-circuit 3 3 is arranged an extra magnet, L, of the ordinary type, having an armature-lever, M, pivoted in the usual manner at *xx*. A spring, *f*, of low power—say one-tenth, or thereabout, the power of the magnet L—is attached to the lever, while a stop, *n*, limits its backward play. The free end of this lever takes under the free end of a pivoted lever, *o*, having a back stop, *p*, and a spring, *f'*, of full power.

Projecting upwardly from the lever is the hook-arm T, adapted to contact with a stop, P, on

wheel 1 when drawn forward by the action of spring *f* on M. The stop P may be on either wheel, or on any member of the type-wheel train. Another arm, *g*, projects from the same lever, forming a pawl whose free end engages with the teeth of a ratchet, O, mounted on the paper-feed wheel N, suitably journaled at *h h*.

The line 3 3 is kept normally charged to, say, ten per cent., or thereabout, of the current to be used in printing.

The arrangements being as indicated, the operation is as follows: Alternating pulsations are sent from the transmitting-station over line 4 4 until the type-wheels are brought to the desired point. Suppose D is so arranged that a zinc current will cause H to be attracted to *z*. If the rigid wheel 1 is to be printed from, a full-strength zinc current is now sent over 3 3, H is attracted to *z*, and *i* throws J and the paper passing over it against 1, spring C pulling 2 up, so that it cannot be printed from. This full current has caused M to be attracted completely toward L, against the stress of both springs *f f'*, carrying *g* into contact with a fresh ratchet-tooth on O. The increment for printing being now taken off from 3 3, the springs *c d*, being of about equal resilience, tend to place H in a neutral position, while *f'* pulls M partially away from L, causing *g* to turn O the space of a tooth and operate the paper-feed. If it now be desired to print from the loose wheel 2, after it is properly positioned, a full-strength copper current is sent over 3 3 and H is attracted to *z'*, pulling down upon the platen J the paper and the wheel 2 by means of the intermediaries *a b*, the other operations being as above detailed. When it is desired to operate the unison device the circuit 3 3 is entirely broken, so as to discharge magnet L. Spring *f* then pulls down M, bringing T into the path of P. The wheels are then caused to make a revolution, or part of one, until P and T contact, locking the wheels. The circuit 3 3 is then made. L attracts M and releases T from P.

The framing of the machine, supports for the axes or journals, motive power, inking devices, paper-reel, roll against which N takes, &c., are not shown in the drawings or described herein, as they are of the usual and well-known construction and form no part of my invention, while their omission aids in the more clear showing of the matter of invention.

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

1. In a printing-telegraph having two type-wheels, the combination of a single electro-magnetic escapement, a type-wheel mounted directly and rigidly upon the shaft, and a type-wheel mounted on a sleeve loose upon the shaft and connected to rotate therewith, substantially as set forth.

2. In a printing-telegraph, the combination of two type-wheels revolving in unison, one of said type-wheels being capable of movement



in a plane at right angles to the axis of rotation, so that it may recede from or approach to the platen, and a platen movable to and from the type-wheels, substantially as set forth.

5 3. In a printing-telegraph, the combination, in the printing-circuit, of a magnet controlling the printing mechanism, and a magnet controlling the paper-feed and the unison mechanism, substantially as set forth.

10 4. The combination of the rigid type-wheel, the loose type-wheel revolving in unison therewith and capable of independent movement in a plane at right angles to the axis of rotation, a platen common to both wheels and movable  
15 to and from the same, and mechanism, substan-

tially as described, for actuating and controlling the movement of said parts, whereby in the operation of printing from the rigid type-wheel the platen is actuated to move to and from the wheel, and in the operation of printing from the loose type-wheel the said loose type-wheel is actuated to move to and from the platen, substantially as and for the purposes hereinbefore set forth.

This specification signed and witnessed this 25  
1st day of March, 1883.

STEPHEN D. FIELD.

Witnesses:

MELLEN SHINER,  
GEO. W. CASPER.