

S. D. FIELD.

ESCAPEMENT AND UNISON MECHANISM FOR PRINTING TELEGRAPHS.

No. 291,705.

Patented Jan. 8, 1884.

Fig. 2.

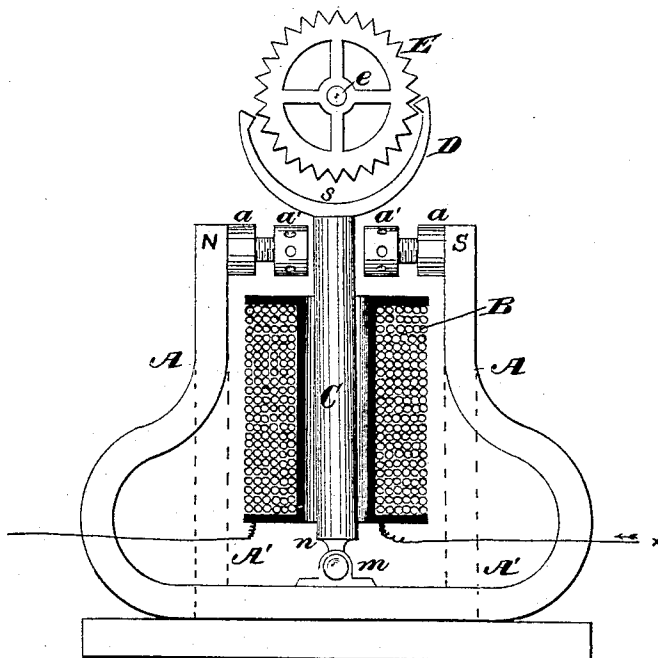
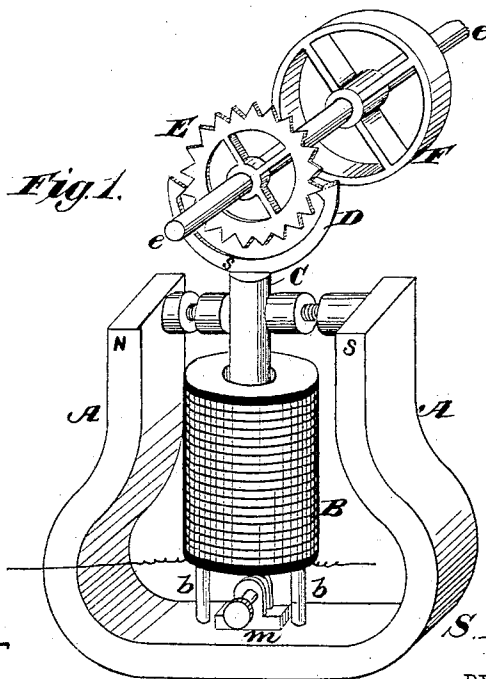


Fig. 1.



WITNESSES:

S. D. Mott
Robert Everett

INVENTOR:

S. D. Field

BY *Merallus Bailey*
ATTORNEY.

(No Model.)

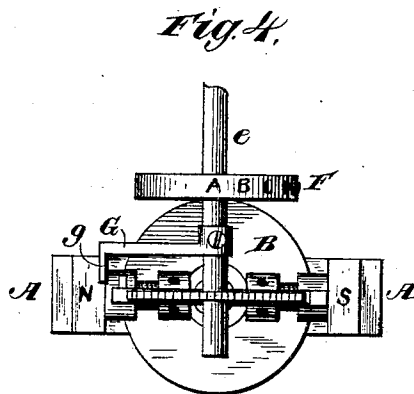
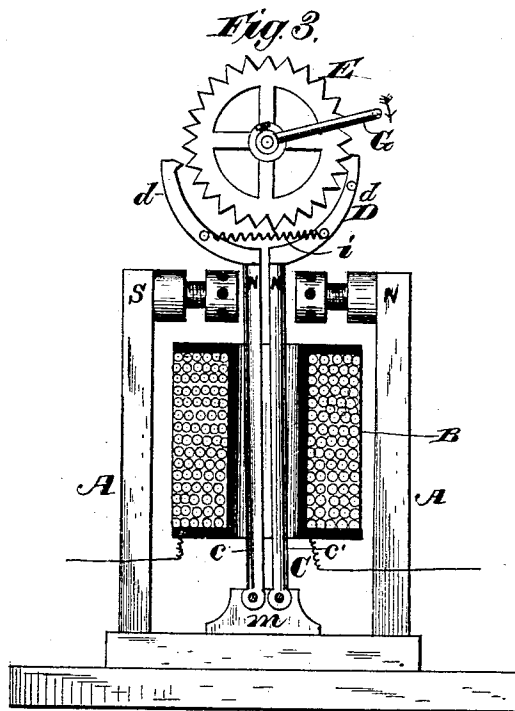
2 Sheets—Sheet 2.

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Robert Everett

Charles S. Hyer

Inventor.

S. D. Field.

By Marcellus Bailey

Atty.

UNITED STATES PATENT OFFICE.

STEPHEN D. FIELD, OF NEW YORK, N. Y., ASSIGNOR TO THE COMMERCIAL TELEGRAM COMPANY, OF SAME PLACE.

ESCAPEMENT AND UNISON MECHANISM FOR PRINTING-TELEGRAPHS.

SPECIFICATION forming part of Letters Patent No. 291,705, dated January 8, 1884.

Application filed October 8, 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 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 thereon.

As is well known, in the use of step-by-step printing-telegraphs, especially for the reporting of gold and stock quotations and commercial news generally, ordinarily called "tickers," as great degree of speed of operation as can be attained is desirable. One important factor in the attainment of the highest practicable speed is the rapidity of operation of the escapement controlling the movement of the type-wheel. Ordinarily a make and break of the circuit of what are termed the "type-wheel" or "escapement" magnets has been used, in which instance a certain amount of time is lost in the magnetization and demagnetization of the magnets, which two operations must occur with every make and break to render such makes and breaks effective. In other instances it has been proposed to use a polarized relay, such relay being composed of a permanent magnet and a vibrating tongue playing between its poles, the polarity of one or the other only being affected by a coil through which reversed currents may pass. I have found that, if a coil, its armature, and a permanent magnet be arranged in such relation to each other that the polarity of both the permanent magnet and the armature be simultaneously effected, the operation of the two latter, one upon the other, will be much more rapid than in the arrangement noted—that is, the rate of vibration of the movable one to the stationary one will be largely increased, and consequently, if such an arrangement or combination be used in connection with the escapement of a printing-telegraph, the operation of the escapement, and consequently the positioning of the type-wheel, will be much speeded and facilitated.

One object of my invention is to effect such increased speed of the printing-instrument, to which end I use the arrangements and combinations hereinbefore generally stated; and the object of the invention is to furnish a reliable and speedily-operated unison mechanism, which, when thrown into operation, shall cause all the type-wheels of all the instruments in circuit to be instantaneously and automatically set at the unison or other predetermined point, typically illustrated in the drawings, in which—

Figure 1 is a perspective view of the escapement mechanism of a printing-telegraph, and Fig. 2 is a view, partly in section, thereof, while Fig. 3 is a view, partly in section, and Fig. 4 a plan or top view, of the modification embodying the unison referred to. It is to be noted, however, that the framing, printing, unison, inking, and other mechanisms necessary to a complete printing-telegraph form no part of the invention in this case, and hence, for clearness of illustration of the actual invention, are omitted from the drawings. It is to be understood, also, that the escapement illustrated may be used with any form of one or two wheel or one or two line printer, or with any form of type-wheel, inking, printing, or unison mechanism or framing.

In the drawings, referring now to Figs. 1 and 2, A is a permanent magnet, so constructed as to embrace on opposite sides the electro-magnetic coil B, whose terminals 1 2 are connected to what is known as the "type-wheel," or "escapement" circuit. For clearness, this magnet is shown as bowing away from the electro-magnetic coil B; but I prefer to form it so as to embrace said coil B as closely as possible, as shown in dotted lines in Fig. 2. The ends of this magnet are preferably screw-threaded, or provided with screw-threaded projections or nuts *a*, in which take the set-screws *a'*, (both *a* and *a'* being of magnetic material,) so that the poles NS of A are extended to *a'*, and are adjustable relatively to each other. Upon the center or neutral point of A, and in a non or dia magnetic seat or pivot, *m*, is pivoted the core C of the coil B, which core passes

through the center of B and between the polar extensions *a* of A. The core C carries at its free end the anchor D, which takes into and controls the movement of the escapement E on shaft *e*, which shaft may have a tendency to rotate imparted to it by a prime motor; or the anchor D and escapement E may be so fashioned that D shall impart motion to E, instead of merely controlling it, both methods being now well known and understood in the art. Upon the shaft *e* is the type-wheel F, of which there may be any number, whose motion or positioning is consequently controlled or regulated by the movement of C, D, and E. From this it will be seen that the coil B is so arranged relatively to both A and C as to affect the polarity of both, and that as C is pivoted at its lower end—the point most distant possible in the lever from where (*a' a'*) the force is applied to it—the minimum of force at *a' a'* will give it the greatest possible vibration. The coil is so wound that if a positive current enters by 1, as in Fig. 2, the poles of A being normally as shown, C shall be made a magnet with the poles *n s* as shown. The coil C, however, affects the strength of A as well, strengthening the pole N and weakening the pole S, C therefore moving quickly and under the influence of comparatively weak currents toward the extension *a* of N. If, now the current be reversed, the upper end of C will become *n*, while S of A is strengthened and N weakened, C moving quickly under these influences toward *a'* of S. By this construction I am enabled to construct an escapement quick and reliable in action and capable of great rapidity of vibration, so as to give a maximum of speed in positioning a type-wheel or type-wheels for printing.

In Figs. 3 and 4 the same general principles are involved, the core C being modified in construction, so as to form the basis or principal part of the unison referred to. In this case the core C is made in two portions, *c c'*, preferably semicircular, with their flat surfaces toward each other, and each independently pivoted on *m*. Each carries a half, *d*, of the anchor D, and they are normally held together at their free ends by a spring, *i*. The coil B, however, makes both parts, *c c'*, magnets with similar polarity at the same end; hence they tend to repel. The spring *i* is consequently made of such resilient force that, with the current normally used to operate the type-wheel escapement, it shall overcome this tendency to repel and hold together the two parts *c c'*, which, thus held together, are in proper position for keeping the halves *d d* of the anchor D in such relation as to control and regulate the escapement E, its prime motor, and the type wheel or wheels. If, however, a current of abnormal strength be sent through B, the magnetic intensity of *c c* is so increased that the repulsive power of the similar poles is greater than the resilience of *i*, and this is taken advantage of to form

the instantaneous unison spoken of. Upon one of the parts of the anchor is placed a stop, *d*, and upon the shaft *e* of the escapement and type wheel is placed an arm, G, rotating therewith, and ending in a projection or lug, *g*. G, *g*, and *d* are so arranged relatively to each other that, while *c c'* are held together, *d* lies within the path of *g*; but when *c c'* are forced apart by the repulsion of similar polarities at their free ends, *d* will lie in the path of *g*. From this it is evident that whenever *c c'* are thus forced apart the anchor D will be released from escape-wheel E, and the shaft *e* and type-wheel immediately rotate under stress of the prime motor referred to until *g* and *d* come in contact, so that when it is desired to be certain that all instruments in circuit are at unison it is simply necessary to send over the line an increased or abnormal current. Thus, in the interval ordinarily required for the transmission of a single impulse, it is possible to control the unison without, as is usually the case in other unisons, waiting for the time necessary to revolve the type-wheel several or more times.

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

1. In a printing-telegraph, the combination of a permanent magnet, an electro-magnet, a core for the latter pivoted upon or at the neutral point of the permanent magnet, and with its free end playing between the poles of the permanent magnet, and an anchor-escapement and type-wheel, substantially as set forth.

2. The combination of a coil, a permanent magnet embracing the coil, and a core, movable therein, and pivoted at or near the neutral point of the permanent magnet, substantially as set forth.

3. The combination of a coil, a permanent magnet embracing the coil, a core for the coil, movable therein, and pivoted at or near the neutral point of the permanent magnet, and playing at its free end between the poles of the permanent magnet, and adjustable stops on the poles of the permanent magnet, for regulating the motion or vibration of the core, substantially as set forth.

4. The combination of a coil, a permanent magnet embracing the coil, a core for the coil, movable therein, and pivoted at one end at or near the neutral point of the permanent magnet, and playing at the free end between the poles of the permanent magnet, adjustable stops on the poles of the permanent magnet, for regulating the motion or vibration of the core, and an escapement, anchor, and type-wheel, substantially as set forth.

5. The combination, with a single coil and a permanent magnet, of a divided core for the coil, each division carrying one part of an anchor, and normally held together by a spring, substantially as set forth.

6. The combination of a divided anchor, a stop carried thereby, and an arm on the

type-wheel shaft, so arranged that the arm shall contact with the stop when the divided anchor is forced apart, substantially as set forth.

- 5 7. A combined escapement and unison device, consisting of a divided armature and anchor normally held together, and a stop on the type-wheel shaft, arranged to contact when the divided anchor is forced apart and stop

the type-wheel shaft at a predetermined point, substantially as set forth.

This specification signed and witnessed this 2d day of October, 1883.

STEPHEN D. FIELD.

Witnesses:

LUTHER E. SHINN,
J. B. SCOTT.