2 Sheets—Sheet 1.

G. L. ANDERS.

Dial Telegraph.

No. 113,240.

Patented April 4, 1871.

Fig. 2.

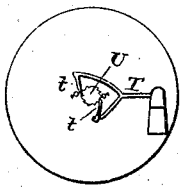


Fig. 3.

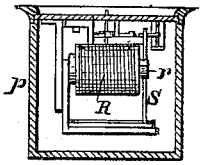


Fig. 4.

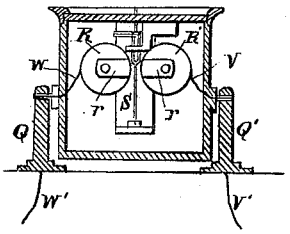
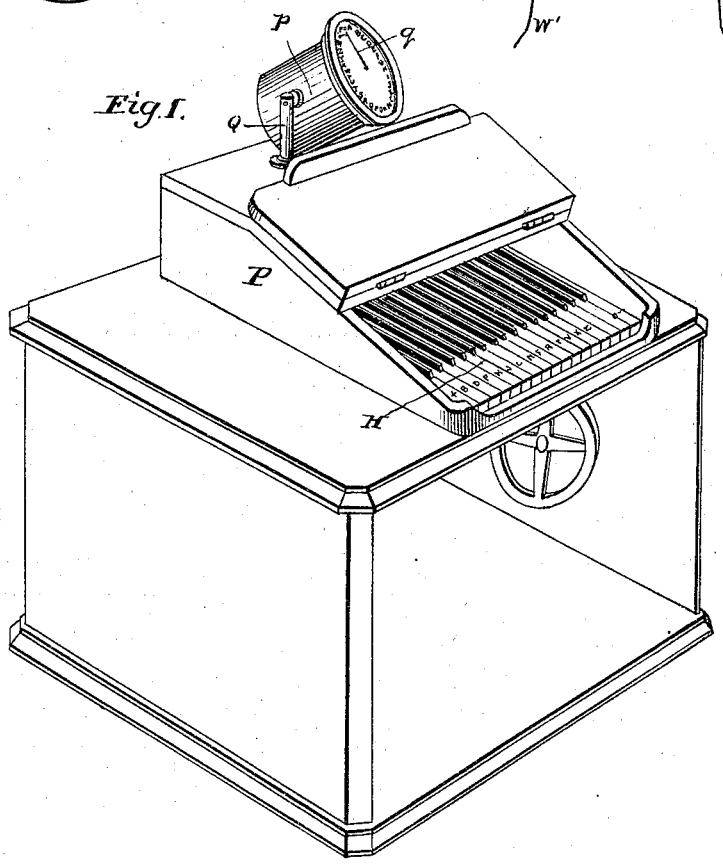


Fig. 1.



Witnesses.
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Dial Telegraph.

2 Sheets—Sheet 2.

No. 113,240.

Patented April 4, 1871

Fig. 5.

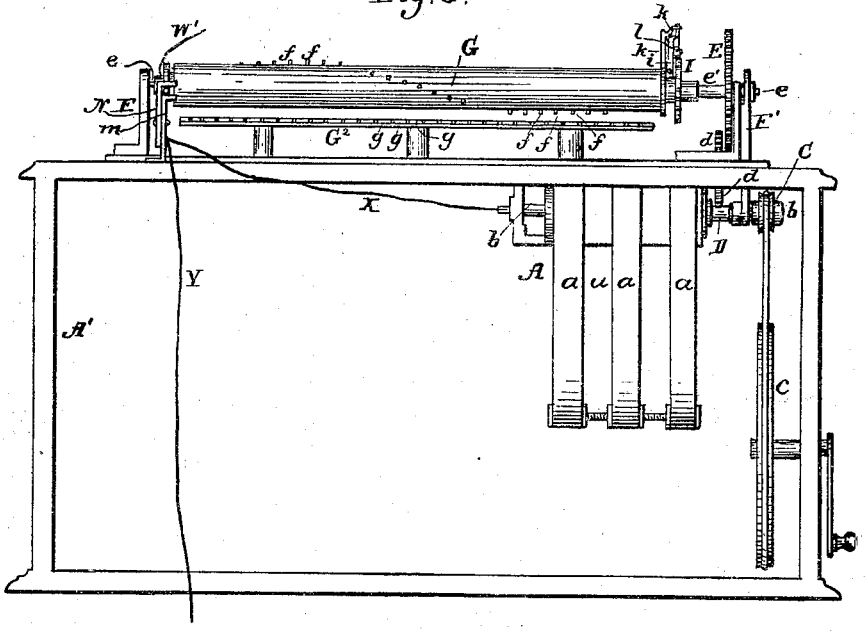


Fig. 6.

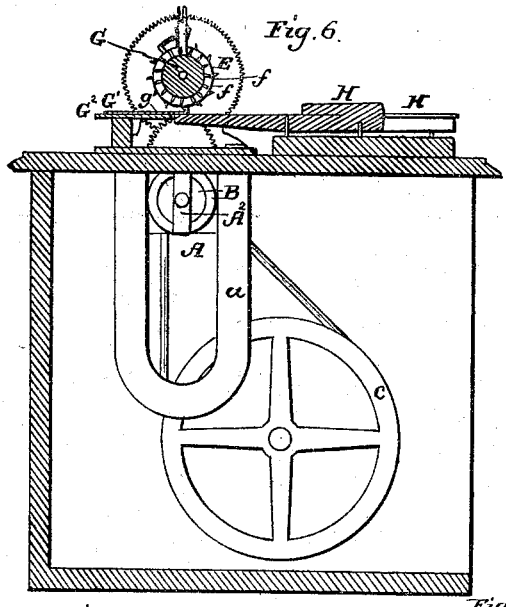


Fig. 7.

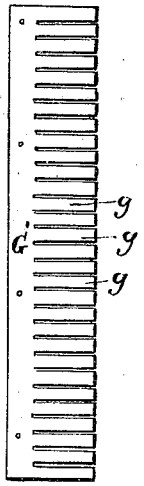


Fig. 9.

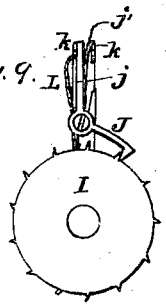


Fig. 10

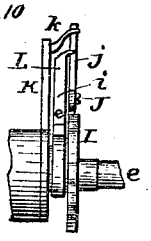
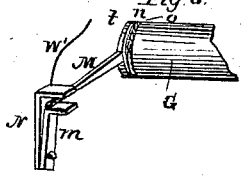


Fig. 8.



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UNITED STATES PATENT OFFICE.

GEORGE L. ANDERS, OF BOSTON, ASSIGNOR TO E. B. WELCH, OF CAMBRIDGE, MASSACHUSETTS.

IMPROVEMENT IN MAGNETO-ELECTRIC DIAL-TELEGRAPHS.

Specification forming part of Letters Patent No. **113,240**, dated April 4, 1871.

To all whom it may concern:

Be it known that I, GEO. L. ANDERS, at present residing in Boston, Massachusetts, have invented certain Improvements in Magneto-Electric Dial-Telegraps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings and letters of reference marked thereon, making a part of this specification, in which—

Figure 1 a perspective view of my invention. Fig. 2 is a plan view of the cap of indicator *p*, inverted. Figs. 3 and 4 are sectional views of the indicator *p*, showing side elevations of the interior. Fig. 5 is a side elevation with the key-board and top casing removed. Fig. 6 is a transverse vertical section through line *x x*, Fig. 5; and Figs. 7, 8, 9, and 10, views of parts in detail.

This invention relates to magneto-electric dial-telegraph instruments of the "step-by-step" description, wherein keys are employed to select the letters and characters to be indicated, its object being to obviate the use of the old arrangement of keys, which are located radially around the dial, and to facilitate the operation of selecting said letters; and it consists mainly in the combination of a magneto-generator with a drum fitted loosely on a shaft or arbor, revolved by suitable gearing, and provided on its periphery with a line of radial pins or projections running spirally from end to end thereof.

It also consists of a series of catch-springs under said drum, operated by a straight bank of keys, similar to those of the piano-forte, in such manner that each key raises a spring which engages with one of the pins on the drum and arrests the revolution of the same, said drum being connected to its revolving shaft or arbor by a ratchet-and-pawl arrangement, similar to that employed in the magneto of Prof. Wheatstone, whereby the connection between the drum and arbor is maintained, and the drum revolved until the motion of the latter is arrested by the means before mentioned, when said connection ceases, and the arbor revolves without the drum until the same is released, when the connection is resumed.

It also consists in a contact pin or lever, located on the arbor of the drum, and other details of construction, which will be more fully described hereinafter.

In the drawings, A represents the magneto-generator, which is located within the case A^1, and consists of the horseshoe-magnets *a a a*, between the poles of which is a revolving armature, B.

The armature B is located on a shaft, *b*, which has an insulated bearing, A^2, and is revolved by a belt passing over pulley C from drive-wheel *c*, this latter being operated by a crank or treadle, as desired.

The shaft *b* is provided with a pinion, D, which meshes with cog-wheel *d*, which has its bearings in the top of case A^1, its shaft being in turn provided with a pinion which meshes with the cog-wheel E, which latter is loosely sleeved on shaft *e*, which has its bearings in standards F F′ on the top of case A^1.

On the shaft *e* is a drum, G, which is fitted loosely thereon, composed of india-rubber or other like material, and provided with a line of radially-projecting pins, *f*, running spirally from end to end of the drum.

Immediately under drum G is a metallic spring-plate, G^1, constructed like a comb, with teeth or springs *g*, attached to a plate, G^2, over the upper surface of case A^1, said springs having their ends bent upward to form catches.

The springs *g* are so located with relation to pins *f* that each spring, when raised, will catch one of said pins and suspend the revolution of drum G; the raising of the springs being effected by a bank of keys, H, which are similar to those of a piano-forte, each key, when depressed, raising a corresponding spring.

The shaft *e* is provided with a ratchet, I, which, with the cog-wheel E, is attached to a sleeve, *e′*, which turns loosely on shaft *e* near one end of drum G, between which and the ratchet I is an arm, *i*, which is rigidly attached to shaft *e*.

To the arm *i* is pivoted a pawl, J, which is provided with an arm, *j*. K represents an arm on the end of drum G, which arm is provided at its upper end with two fingers or projections, *k k′*, which project on both sides of arm *j* of pawl J, and allow the same to have

a limited play between them. The arm *j* is provided with a spring, *j'*, which bears against finger *k'*, while a spring, L, on arm *i* bears against the opposite side of arm *j*.

Near the opposite end of drum G is a metal disk, *l*, which is loosely located on shaft *e* and provided with an arm or lever, M, the end of which projects between the ends of standard *m* and insulated plate N, the insulation of the latter being effected by a layer of rubber between itself and standard *m*, as shown in Fig. 8.

Between the disk *l* and the end of drum G is a disk of leather, *n*, and another metal disk, *o*, which is provided with a spring which presses disks *n o* against disk *l*, which, when revolved, exert sufficient friction against disk *l*—which is prevented from revolving by the contact of lever M with plate N—to secure a positive reaction of the lever when the drum ceases its motion, thereby securing a positive change of contact from the plate N to standard *n*, and also securing the efficient operation of the ratchet-and-pawl arrangement I, J, &c., at the opposite end of the drum G.

On the upper surface of casing A^1 is a disk or casing, P, which incloses the key-board and other mechanism. On the casing P is located an indicator, *p*, which consists of a cylindrical metallic case pivoted between metallic pillars Q, and provided at its upper end with a dial-plate containing the characters, figures, &c., and a pointer or index, *q*. Within the case *p* are helices R R', having armatures *r r*, between which is a vertical bifurcated lever, S, pivoted at its lower end, its bifurcations embracing a horizontal bifurcated lever, T, which is pivoted to the under surface of the cap of case *p*, as shown in Fig. 2, and provided with pawls *t t*, which bear against the ratchet U, which is located on the shaft of the index *q*, the same being operated by the vibration of lever S between armatures *r*, caused by the alternation of currents through helices R, said vibrations being imparted, through lever T and pawls *t*, to escape-wheel U.

The helix R' is connected by wire V, pillar Q, and wire V' with the distant indicator or with the ground, while the helix R is connected by wire W, pillar Q, and wire W' to the insulated plate N. The shaft B, which has an insulated bearing at A^2, is connected to standard *m* by wire X, and the latter with the ground by wire Y. The standards F F' are located on a metallic plate, Z, which, with the arbor *e*, forms a conductor from end to end of the machine.

Operation: The magneto current is generated by revolving the armature B, one end of which is connected, through wire X, with the contact-standard *m*, as before mentioned, and the other end, through the metallic portions of the machine, with the lever M.

To send a message, the first key is depressed, thereby releasing the last key, marked "stop," which, when in its natural position, acts to raise its spring *g* and detain the drum G, which now commences its revolution, and the current passes through indicator *p*, which current, passing through helices R R', imparts a vibratory motion to lever S, which communicates said motion to lever T, which revolves escape-wheel U, and operates the hand *q* of the indicator.

The revolution of the drum is effected by the spring L pressing the arm *j* of pawl J forward, and causing the latter to bear upon the periphery of the ratchet-wheel I, and engage with the teeth of the same, thereby connecting the drum with the shaft; but when the motion of said drum is arrested, the finger *k'* of arm K is caused, by the reaction of the drum, as before mentioned, to force the arm *j* backward, thereby raising pawl J, and clearing the same from the teeth of ratchet I.

When the motion of the drum is arrested, the contact-lever M, which was in contact with the insulated plate N, drops on the contact-standard *m*, thereby breaking the current through the indicator *p*, suspending the vibration of levers S T and revolution of the escape-wheel U, which causes the needle or pointer to stop at the letter corresponding to the key depressed.

The desired letter being thus indicated at every depression of a key, and the consequent raising of one of the springs *g*, the indicator points out the letter, while the same function is performed on the distant indicator on well-known principles.

The pressure being removed from that key H which had been depressed, the spring *g* which had arrested the drum G resumes its former position by its own elasticity, and releases said drum, which is revolved slightly by means of the friction exerted by disks *n* O, this slight motion being sufficient to cause the arm K of drum G to come in contact with the arm *j* of pawl J, thereby imparting sufficient motion to the same to engage said pawl with the ratchet I, which causes the drum to revolve until again arrested, as above described.

The springs of plate G^1 perform three functions—as springs for the keys H, as springs for the catches formed by bending their ends, and as catches for detaining the drum G, as described.

The advantages of this arrangement are the facility and ease with which it is worked, the operator being enabled to sit at the machine and manipulate the keys and work the treadle or crank at the same time, without obstructing his view of the dial, while by the use of the straight key-board the whole mechanism is enabled to be covered by the disk-shaped casing P, which, when closed, is of great convenience to the operator in copying.

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

1. The drum G, composed of rubber or other like material, provided with the pins *f*, arranged spirally, in combination with the

spring-plate G^1 and keys H, all arranged and operated substantially as described.

2. The drum G, provided with arm K, having fingers *k k'*, in combination with arm *i*, pawl J, arm *j*, springs L *j'*, and ratchet I, substantially as described.

3. The drum G, in combination with friction-disk *l*, and its operating-lever M, substantially as described.

4. The spring-plate G^1, provided with catch-springs *g*, substantially as set forth.

5. The combination, with a magneto-electric dial-telegraph, of a straight key-board, H.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEO. L. ANDERS.

Witnesses:
CARROLL D. WRIGHT,
C. F. BROWN.