(No Model.) 3 Sheets—Sheet 1.

T. M. FOOTE.

PRINTING TELEGRAPH.

No. 434,261. Patented Aug. 12, 1890.

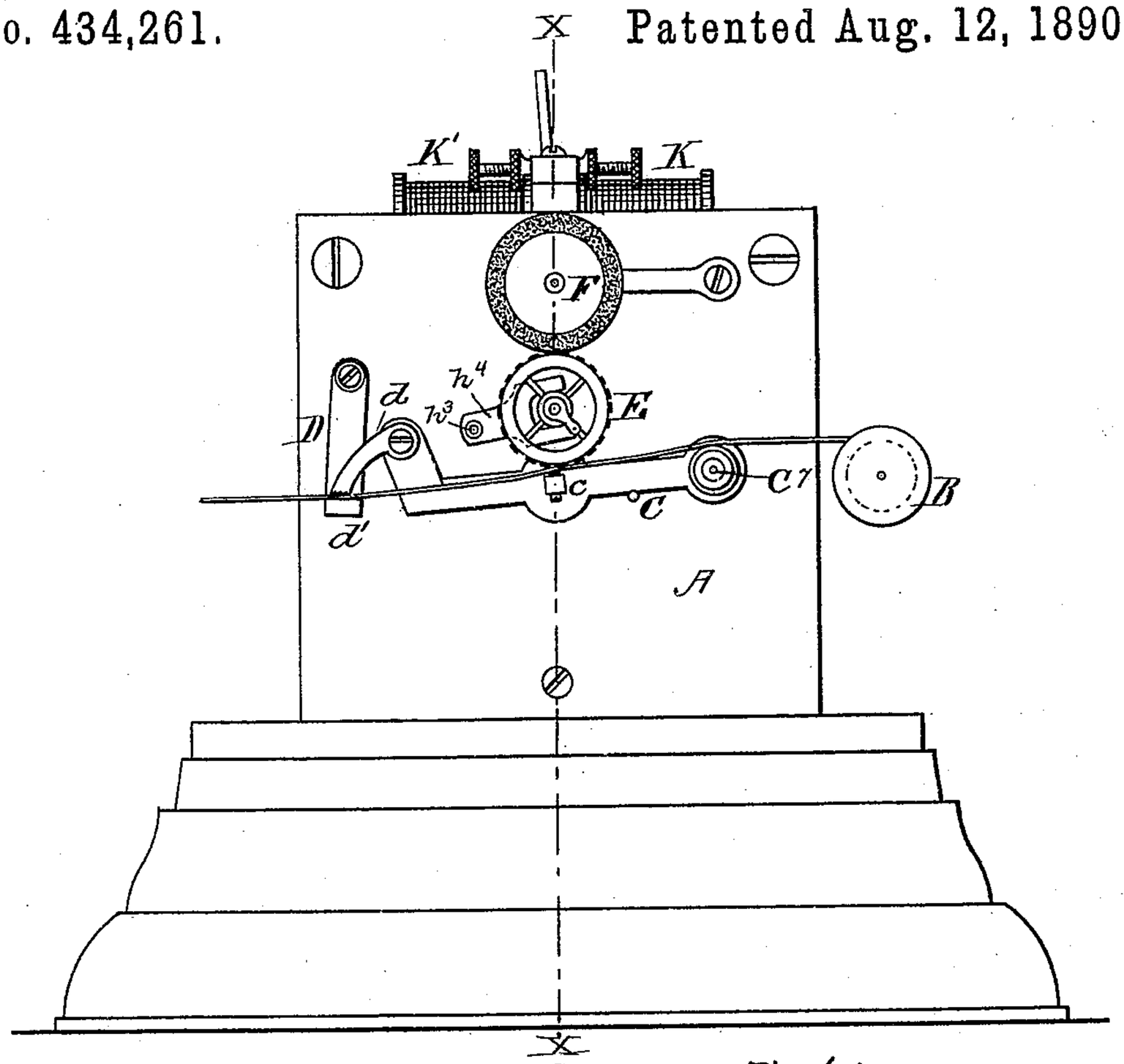

Fig. 1.

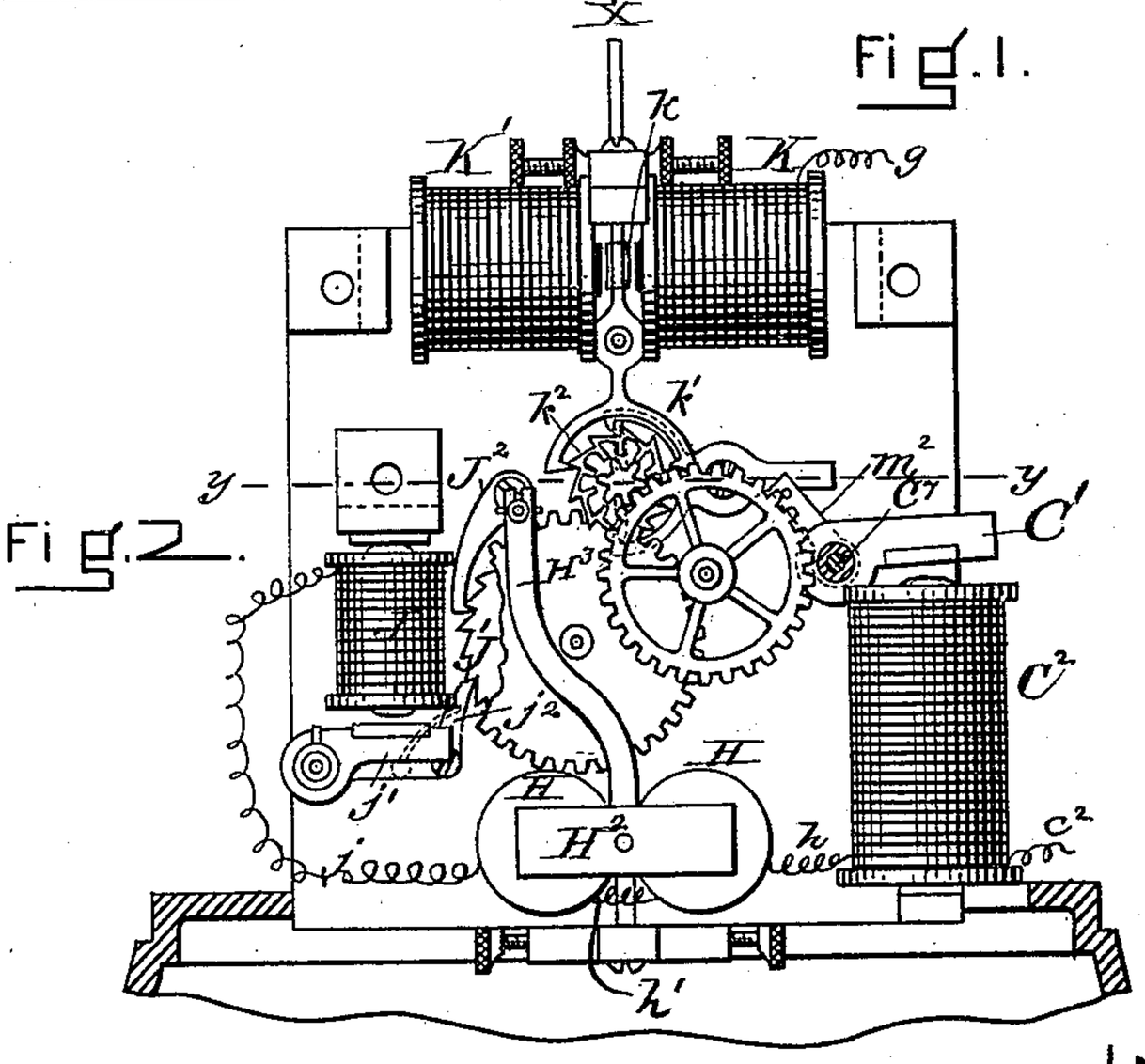

Fig. 2.

WITNESSES.
J. M. Dolan
A. P. Porter.

INVENTOR.
T. M. Foote
by his attys Clarke & Raymond

(No Model.) 3 Sheets—Sheet 2.

T. M. FOOTE.

PRINTING TELEGRAPH.

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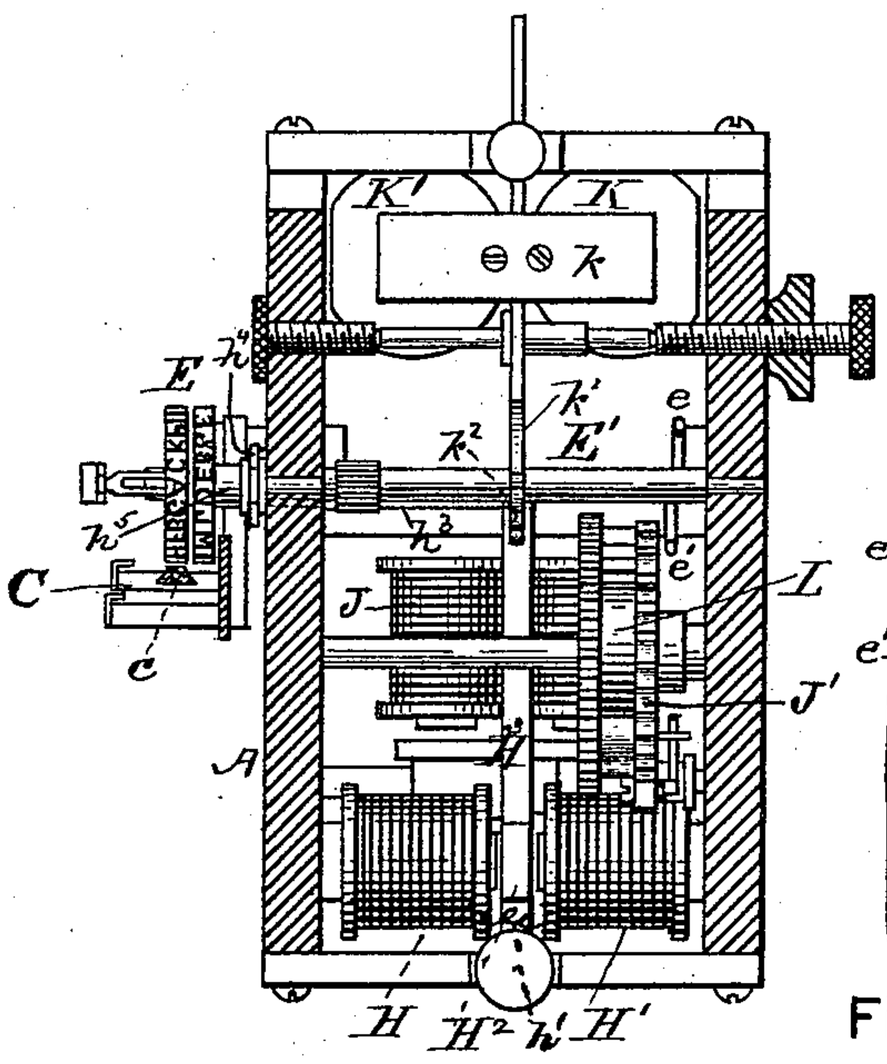

Fig. 3.

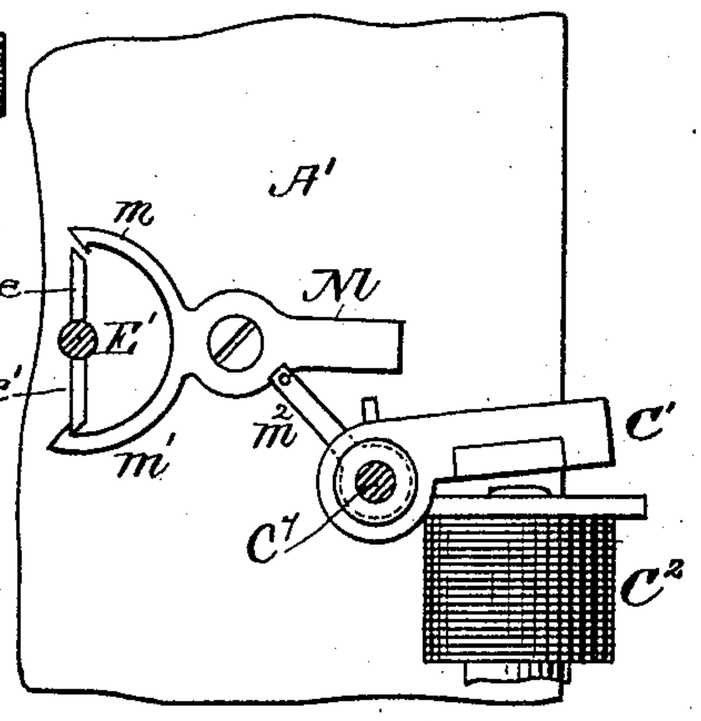

Fig. 4.

WITNESSES.
J. McDolan
A. P. Porter

INVENTOR.
T. M. Foote
by his atty Clarke & Raymond

(No Model.) 3 Sheets—Sheet 3.

T. M. FOOTE.

PRINTING TELEGRAPH.

No. 434,261. Patented Aug. 12, 1890.

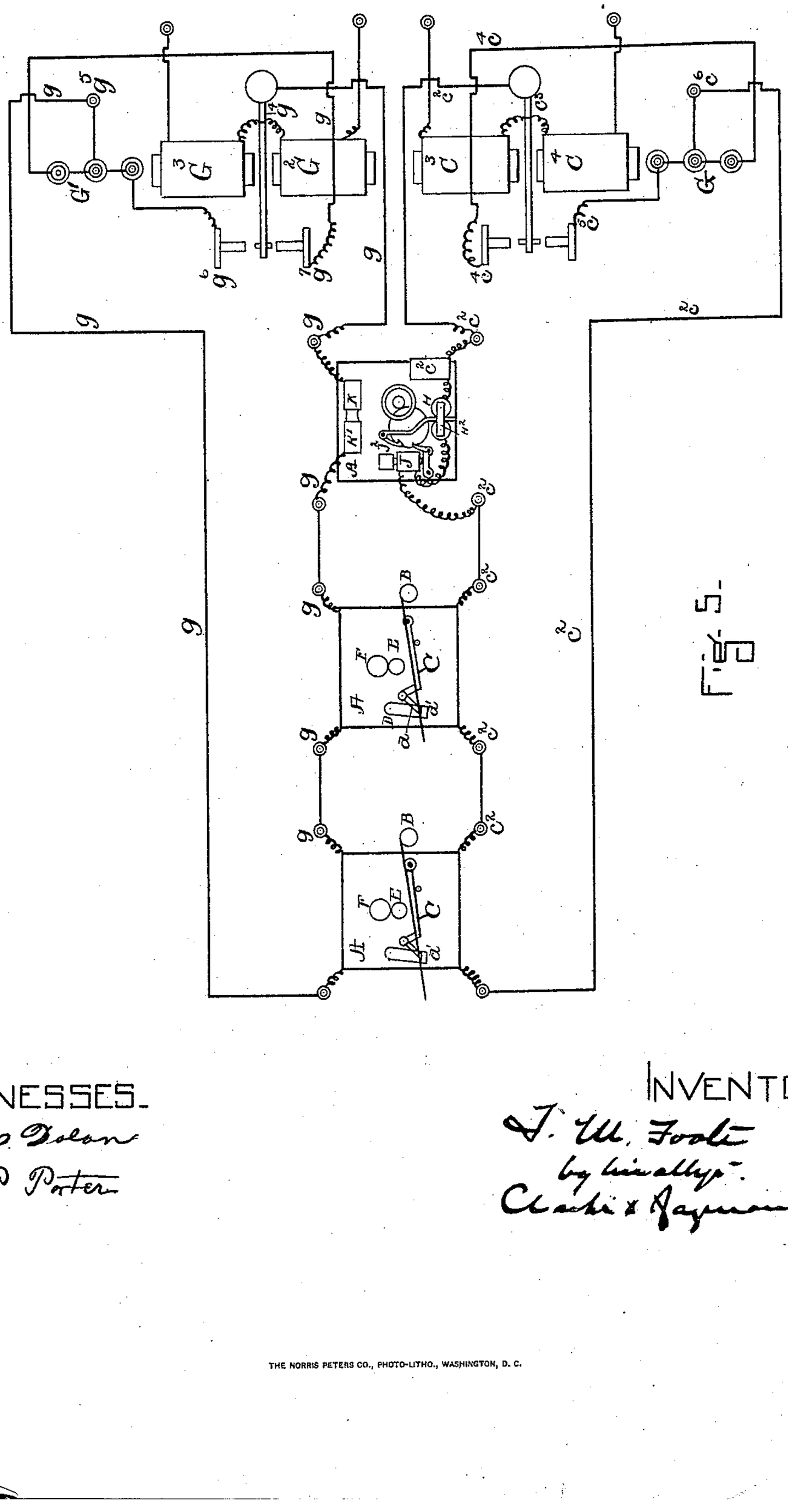

FIG. 5.

WITNESSES.
L. Mc Dolan
A. P. Porter

INVENTOR.
T. M. Foote
by his attys.
Clarke & Raymond

UNITED STATES PATENT OFFICE.

THEODORE M. FOOTE, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO CHARLES J. PILLSBURY, OF SAME PLACE.

PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 434,261, dated August 12, 1890.

Application filed July 27, 1889. Serial No. 318,875. (No model.)

To all whom it may concern:

Be it known that I, THEODORE MARSHALL FOOTE, of Boston, in the county of Suffolk and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Telegraphic Printers, whereof the following is a specification sufficient to enable others skilled in the art to make and use this invention.

In the drawings, Figure 1 is an elevation of the machine upon the printing side. Fig. 2 is an elevation from the same point of the interior of the machine as it will appear when the front plate is removed. Fig. 3 is a vertical section on the line *x x* of Fig. 1. Fig. 4 is an elevation of the unison or stop mechanism which compels at short intervals, to be determined by the operator, all the machines of a circuit to start with their type-wheels in the same position; and Fig. 5 is a diagram of the circuit, showing three machines inserted therein, the first of which at the right-hand is represented with the front plate removed, as shown in Fig. 2 of the drawings, in order that the course of the circuit through the machine may be more readily traced. The other two are in elevation, as shown in Fig. 1; but the current is supposed to pass through them in the same way as is shown in the right-hand machine.

Like letters indicate like parts in all the figures.

A is the side plate of the machine.

B is the tape-spool on which the continuous tape of paper which receives the impression is wound, and from which it is unwound as the message is printed.

C is the printing-lever. It has a platen *c* near its center over which the paper runs, and by which the paper is lifted and pressed against the type.

E represents the type-wheels.

F is the inking-roller.

D is the swinging arm, which is pivoted to the plate A, and has an offset *d'* at its lower end over which the paper tape runs, and against which it is pressed by the feed-dog *d*, attached to the end of the press-lever C.

The press-lever C is actuated by an arm C', Fig. 2, which is the armature of the magnet C^2. The arm C' is attached to a small rock-shaft C^7, to which the printing arm or lever C is also attached. This magnet C^2 is connected with the line-wire c^2, which line-wire runs to a swinging arm c^3, Fig. 5, which swinging arm c^3, if attracted by the magnet C^3, will connect with the shunt-wire c^4, which runs to the battery G, and send from said battery an impulse through the circuit. If, on the contrary, the arm c^3 is attracted by the magnet C^4, it will connect with the shunt-wire c^5 and send an impulse through the circuit in a reverse direction.

In the diagram, Fig. 5, A represents the various printing-machines of a series, and c^2 represents the line-wires of the circuit. c^6 is a binding-post which connects up the circuit. After the electrical impulse has done its work on the magnet C^2 it follows the wire *h* of Fig. 2 to the magnet H, and after passing through this magnet follows the wire *h'* to the magnet H', Fig. 3. The magnet H and the magnet H' are in the same circuit and operate alternately, according to the direction of the current, on the armature H^2 of Figs. 2 and 3, which armature is a permanent magnet and is attached to a lever H^3, to the free end of which is attached a sliding pin or rod h^3, passing through the machine-casing and provided outside of said casing with a fork h^4, engaging a sleeve or support h^5, on which is mounted the double type-wheel E. The support or sleeve h^5 is splined to an extension of the shaft E', so as to turn with said shaft, but is free to slide back and forth thereon to shift the type-wheel.

The type-wheel is double, as shown in Fig. 3, and the characters used for printing are divided into two series, one of which series is upon the wheel nearest to the plate A of the machine, and the other of which is upon the wheel farthest from the plate of the machine. By having this type-wheel double, in working the machine it takes a less number of electrical impulses to obtain the proper selection of characters, because twenty impulses will bring every one of forty characters to a proper circumferential position for printing, and one impulse will shift the shaft endwise, so as to bring either one of the two type series over the platen *c* in an exact position to print, and the same impulse which puts the

type-wheel into position laterally produces the printing impulse upon the lever. After passing over the magnet H or H′ the electrical impulse proceeds over the wire *j* to the magnet J, which is a winding-up magnet. This magnet J operates upon the armature *j′*, which is connected with a feed-dog j^2, which engages with a ratchet-wheel J′, and moves it forward one tooth at a time, the said ratchet-wheel J′ being held from return by the retaining-pawl J^2 of Fig. 2.

It will be seen that by lifting the lever C the feed-dog *d* will draw back its point over the surface of the paper tape and will engage with this surface when the lever is at its highest point and press it firmly against the offset *d′* of the swinging arm D. On the descent of the lever C the feed-dog must necessarily move its free point away from the central line of the machine, pressing firmly upon the paper, and thus move the paper onward, carrying with it the swinging arm D. On the removal of pressure, the swinging arm D will restore itself to its original position and the feed-dog *d* assume a position for a further feed.

A second battery G′ is provided with a similar series of line-wires to the machines as is provided in the printing-surface already described. G′ is the battery. *g* represents the circuit-wires. G^2 and G^3 represent the magnets. g^4 represents the swinging arm, which is the armature of the two magnets. g^5 is the binding-post, and g^6 g^7 are the reversing-poles, by connection with which alternating currents are sent over the circuit. The line-wires *g* connect with the magnets K and K′. Between these magnets is an armature *k*, (shown in Fig. 3,) which armature serves to oscillate the escapement *k′*. (Shown in Figs. 2 and 3.) This escapement engages with the scape-wheel k^2, which is on the shaft E′. This shaft is run by a train of gearing actuated by a spring-drum L, the spring on which is wound up, as heretofore described. To the shaft E′ are affixed two pins *e e′*. (Shown in Fig. 3 and in an enlarged form in Fig. 4.) These pins of course revolve with the shaft E′. They have, as shown in Fig. 4, beveled ends, and are not set in line with each other. To the back plate of the machine (shown at A′, Fig. 4) there is affixed a rocking lever M, which has a forked end something like the anchor-lever of a watch-movement. The ends of this lever are marked *m m′*. The arm *m′* is placed in the plane of rotation of the pin *e′*, and the arm *m* is placed in the plane of rotation of the arm *e*. It is obvious from inspection of this Fig. 4 that when the lever M is in the position shown in the figure the shaft E′ cannot rotate; but there is attached to the shaft C^7 an arm m^2, which is operated by the magnet C^2, which arm m^2 rocks the lever M upon its pivot and moves the arm *m′* of the anchor out of the path of the pin *e′*. This permits the shaft E′ to revolve. As the two pins *e* and *e′* are not placed diametrically opposite each other in the shaft E′, and as the branches *m m′* of the anchor-escapement are so disposed that the branch *m* lies in the plane of revolution of the pin *e*, and the branch *m′* lies in the plane of revolution of the pin *e′* when the shaft E′ has revolved half-way round, the pin *e′* will pass by the arm *m* and will not engage it; but when a complete revolution of the shaft has been made the point of the pin *e′* will pass the hook of the arm *m′* just before the bevel of the pin *e* strikes the beveled end of the arm *m*, and this arm *m* will then be rocked into its first position, in which position the hook on the arm *m′* will be in a position to catch and hold the point of the pin *e′* when it has completed a second revolution. Thus whenever the lever M is tripped, which it will be every time the printing-lever makes a stroke, the type-wheel will be capable of revolving about two complete revolutions; hence if an electrical impuse is not sent over the press-circuit c^2 while a series of impulses are allowed to pass over the escapement-circuit *g* for a period of about two revolutions of the shaft E′, all the machines will be stopped with their type-wheels in the same position until a stroke has been made with the printing-lever. This form of unison is believed to be a new form.

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

1. In an electrically-controlled printing apparatus operated by alternating currents sent over two independent circuits, the combination, with the double type-wheel, of a laterally-movable rotary support therefor, a scape-wheel k^2, rotating with said type-wheel, an electrically-oscillated escapement adapted to control the revolutions of said scape-wheel and of its shaft, two electro-magnets in the same circuit, and an armature-lever arranged between said magnets and connected with said rotary and laterally-movable support for the said type-wheel.

2. In an electrically-controlled printing apparatus, the combination, with two independent circuits for alternating currents, of a double type-wheel, a laterally-movable rotary support for said wheel, two electro-magnets in the same circuit, an armature-lever arranged between said magnets and connected with said laterally-movable rotary support, a scape-wheel rotating coincidently with said support, an electrically-oscillated escapement controlling said scape-wheel and operated in either direction by a circuit different from that which governs said armature-lever, and a printing arm or lever C and its printing-magnets in the same circuit as that which operates the said armature-lever controlling the lateral movement of the said double type-wheel.

3. In an electrically-controlled printing apparatus operated by alternating currents sent over two independent circuits, the combination, with a double type-wheel and a laterally-movable rotary support therefor, of a scape-

wheel controlling the movements of said support, an electrically-controlled escapement controlling said scape-wheel, an armature-lever connected with said laterally-movable rotary support to shift the same and the said type-wheel laterally, two electro-magnets in the same circuit between which said lever is arranged, a printing-lever C, its printing-magnet, and an electric winding apparatus, consisting of the magnet J, armature j', feed-dog j^2, and ratchet-wheel J', substantially as set forth.

4. In an electric printing apparatus, the combination, with the printing-lever carrying the arm m^2, the anchor-lever M, the shaft E', and the pins e e', substantially as described.

5. In an electrical printing apparatus operated by alternating currents sent over two independent circuits, the combination, with a double type-wheel and a laterally-movable rotary support therefor, of two magnets H and H' and armature-lever H^3, arranged between said magnets and controlling the lateral movements of said wheel, a unison, substantially as described, a printing-lever C, and its platen c, as set forth.

6. In an electric printing apparatus, the combination of the feed-lever C with its platen c, and feed-dog d with the swinging arm D and its offset d', substantially as described.

THEODORE M. FOOTE.

Witnesses:
THOS. WM. CLARKE,
J. M. DOLAN.