(No Model.)

E. T. GILLILAND.

ELECTRIC CALL GENERATOR.

No. 335,693. Patented Feb. 9, 1886.

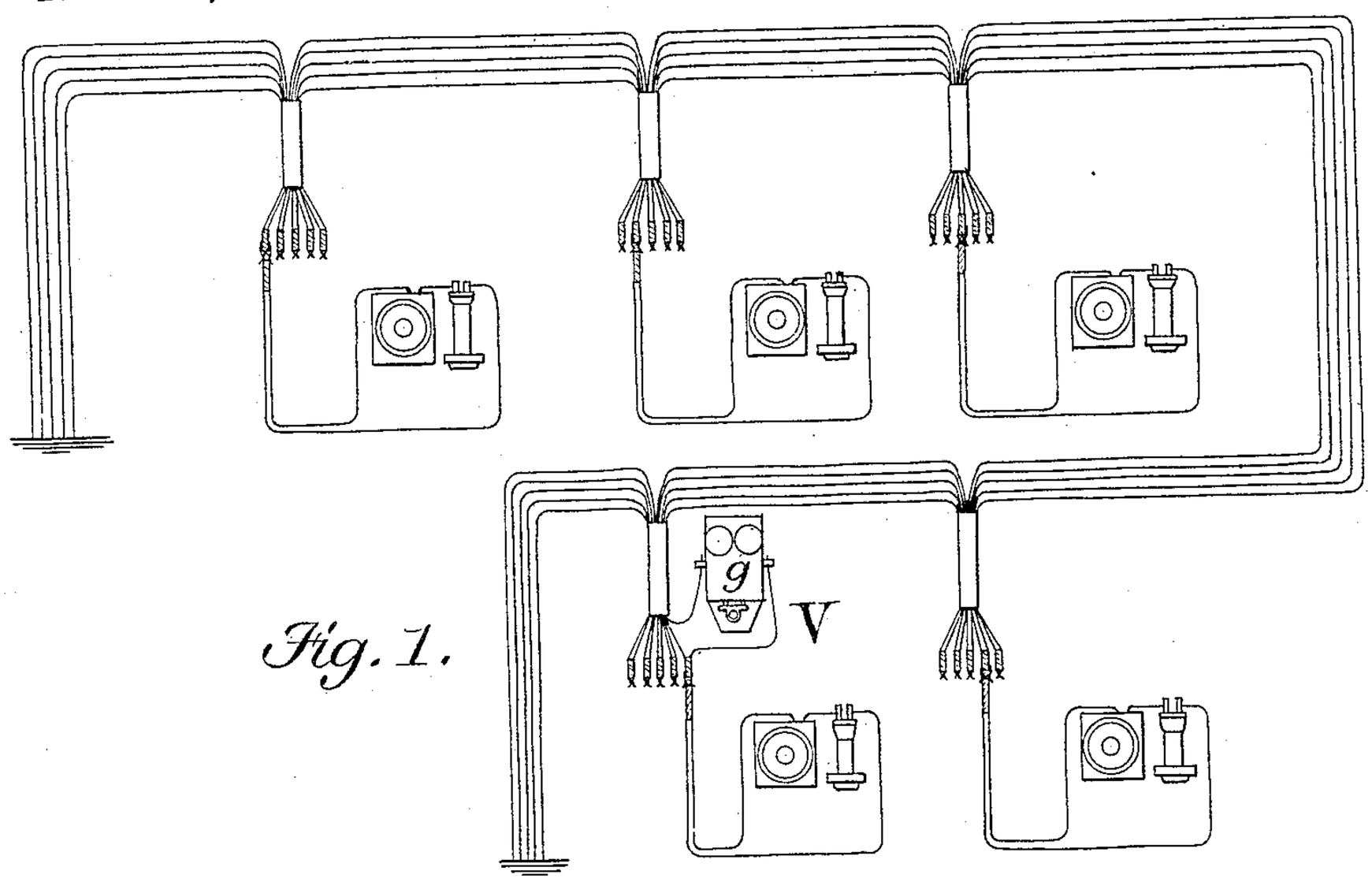

Fig. 1.

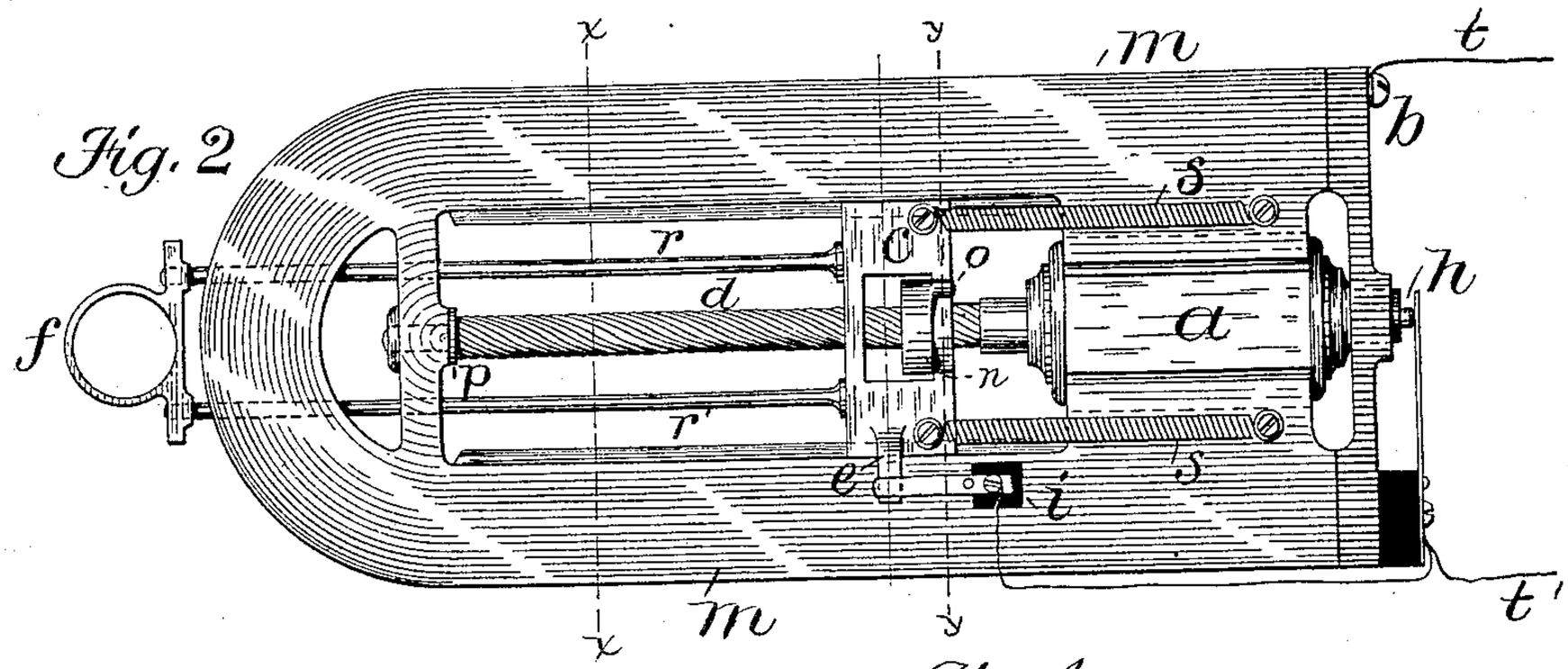

Fig. 2

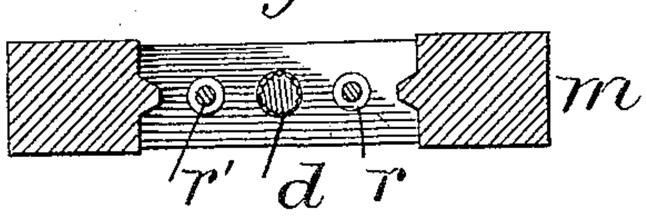

Fig. 3.

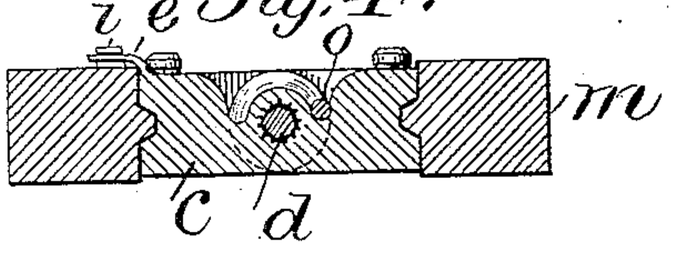

Fig. 4.

Witnesses.
Geo Willis Pierce.
Wm B. Vansize.

Inventor.
Egbert T. Gilliland

UNITED STATES PATENT OFFICE.

EZRA T. GILLILAND, OF BOSTON, MASSACHUSETTS.

ELECTRIC CALL-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 335,693, dated February 9, 1886.

Application filed October 31, 1885. Serial No. 181,526. (No model.)

To all whom it may concern:

Be it known that I, EZRA T. GILLILAND, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Electric Call-Generators, of which the following is a specification.

My invention is an improvement in magneto-electric machines for use in calling or signaling. This improved calling-generator is adapted for use on my "village-exchange" system of telephonic communication, which consists of a series of parallel circuits and a series of sub-stations. Each station is provided with means for placing a telephone set on any circuit of the series. A number of subscribers are normally located on each circuit, the preferred arrangement being five on a line. Each station is provided with telephones, generator, and call-bell. To secure the attention of any one of the stations on a line, a series of vibratory impulses from the generator are transmitted, the number being dependent upon the position of the desired station with respect to the terminal of the line—as first, second, third, &c. When the usual form of generator having for its operating mechanism a rotating crank and gear-wheels is employed, it frequently occurs that the series of vibratory impulses are of different lengths, are too prolonged or too short, and it often happens that one call of a series will be transmitted in so halting and uncertain a manner as to make in effect two or three, giving rise to uncertainty and dissatisfaction.

My present invention is calculated to remedy this difficulty; and it consists of a magneto-generator, the armature of which is caused to rotate a predetermined number of times by a single movement, the operation being as simple as the operation of an ordinary push-button.

In the construction of this generator I firmly connect the rotating armature of the magneto-machine to a freely-rotating high-pitch screw, and on this screw I place a nut traveling in the thread of the screw. An actuator is provided for moving the nut along the screw by a steady pull and returning it to its normal position by a steady push or the action of a retractile spring. Mechanical connection is made between the push-and-pull mechanism and the nut, so that when the said nut is moved in one direction, as by a pull, it is held firmly in position and the screw and armature rotate. When moved in the opposite direction, as by a push, the nut is free to rotate and the screw and armature stand still. The length of the screw determines the number of rotations of the armature. By pulling one, two, or three times a corresponding series of vibratory impulses are transmitted of unvarying length and regularity.

In the accompanying drawings, Figure 1 illustrates the village-exchange system to which my improved calling-generator is applied. Fig. 2 is a complete view of the generator. Figs. 3 and 4 are respectively cross-section views at $x\ x$ and $y\ y$, Fig. 2.

In Fig. 2, m is a permanet magnet. b is a brass bearing-piece fixed to magnet m. a is an armature-coil fixed to a screw, d, having a high-pitch thread—that is, a screw having helically-disposed grooves making but comparatively few turns in the length of the screw. This screw and armature are pivoted to rotate freely at points p and h. The actuator, consisting of a metal block or carriage, c, rides upon rails located upon the interior of magnet m, Figs. 2 and 4. Firmly fixed to this carriage are rods $r\ r'$, terminating in a finger-ring, f. Springs $s\ s$ normally hold carriage c upon a limiting-stop near the armature. Upon the screw d is placed nut n, upon one face of which is a projection, o. There is an aperture in carriage c, within which nut n is placed, and in the to-and-fro movement of c nut n strikes upon one wall or the other of this aperture. When the carriage c is moving away from the armature, the projection o upon nut n engages with the carriage, Fig. 4, and is held and carried along on the screw, forcing said screw and the armature to rotate. When the carriage is released, the springs retract it, nut n and the carriage disengage, the nut rotates as it is drawn along in the thread of screw d, but the armature stands still by reason of its weight, inertia, and friction. One terminal of the armature coil is connected to an insulated bearing, h, from which it is carried by a spring-contact to the line-terminal t'. The other terminal of the armature-coil is connected to the core, to the magnet m, and thence to the opposite terminal, t. When the carriage c is in its normal

position, the armature-coil is shunted from circuit by the contact-points *i* and *e*, which are connected with the opposite line-terminals, respectively.

In Fig. 1 the generator is shown connected in circuit at the first station. To call any station on the circuit, station one has only to pull upon and release the finger-ring of generator *g* two, three, or more times, as the case may be.

What I claim, and desire to secure by Letters Patent, is—

1. An electric generator consisting of the combination of field-magnets, an armature-coil fixed to a rotating screw-threaded bar, a nut traveling in the thread of said screw, and means for moving the said nut along upon the screw-threaded bar to rotate the armature.

2. An electric generator consisting of the combination of an exciting-magnet, an armature-coil fixed to a rotating screw, a nut traveling in the thread of said screw, and an actuator having a reciprocating motion for moving said nut back and forth upon the said screw, whereby the armature is rotated.

3. The combination, in an electric generator, of an exciting-magnet, an armature-coil fixed to a rotating screw-threaded bar, a nut traveling in the thread of said screw, and a reciprocating actuator, which locks with and holds said nut while moving in one direction only, whereby the armature is rotated to generate electric impulses.

4. The combination, in an electric generator, of an exciting-magnet, an armature-coil fixed to a rotating screw-threaded bar, a nut traveling in the thread of said bar, and a spring-retracted reciprocating actuator in position to engage with and hold said nut while moving in one direction, and to release said nut upon its return-movement, whereby electric impulses are generated, substantially as described.

5. In an electric generator, the combination of an armature-coil fixed to a rotating screw-threaded bar, an actuator having a reciprocating motion, a nut carried thereby and adapted to rotate said armature-coil by engagement with said screw-threaded bar, and a short circuit around said coil, including contacts, one of which is carried by said actuator, whereby the short circuit is broken when the actuator is moved to rotate the armature and closed when it is at rest, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 28th day of October, 1885.

EZRA T. GILLILAND.

Witnesses:
WM. B. VANSIZE,
GEO. WILLIS PIERCE.