

H. C. BLISS.
Telephone Call-Bell.

No. 226,480.

Patented April 13, 1880.

Fig. 1.

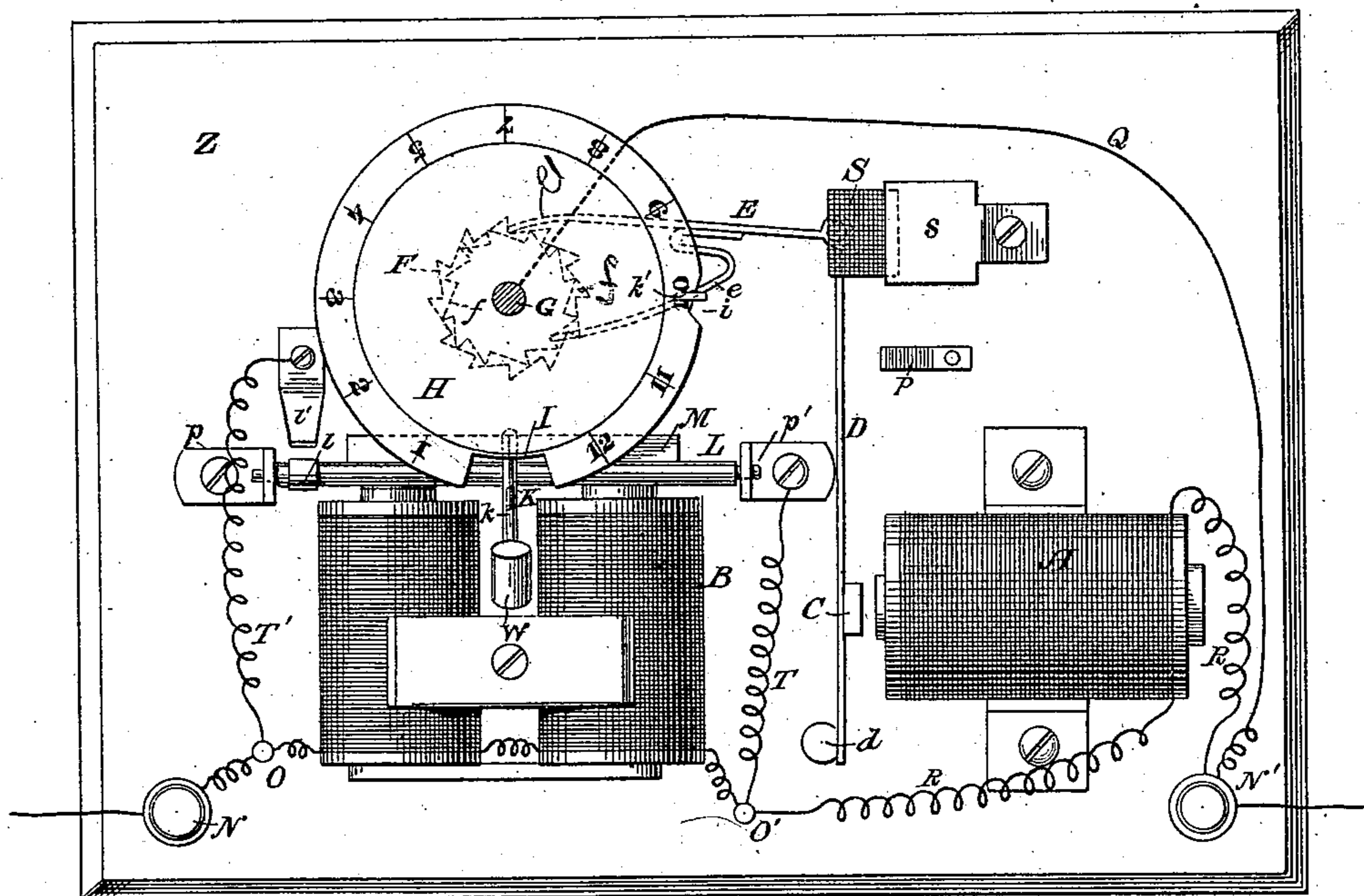


Fig. 2.

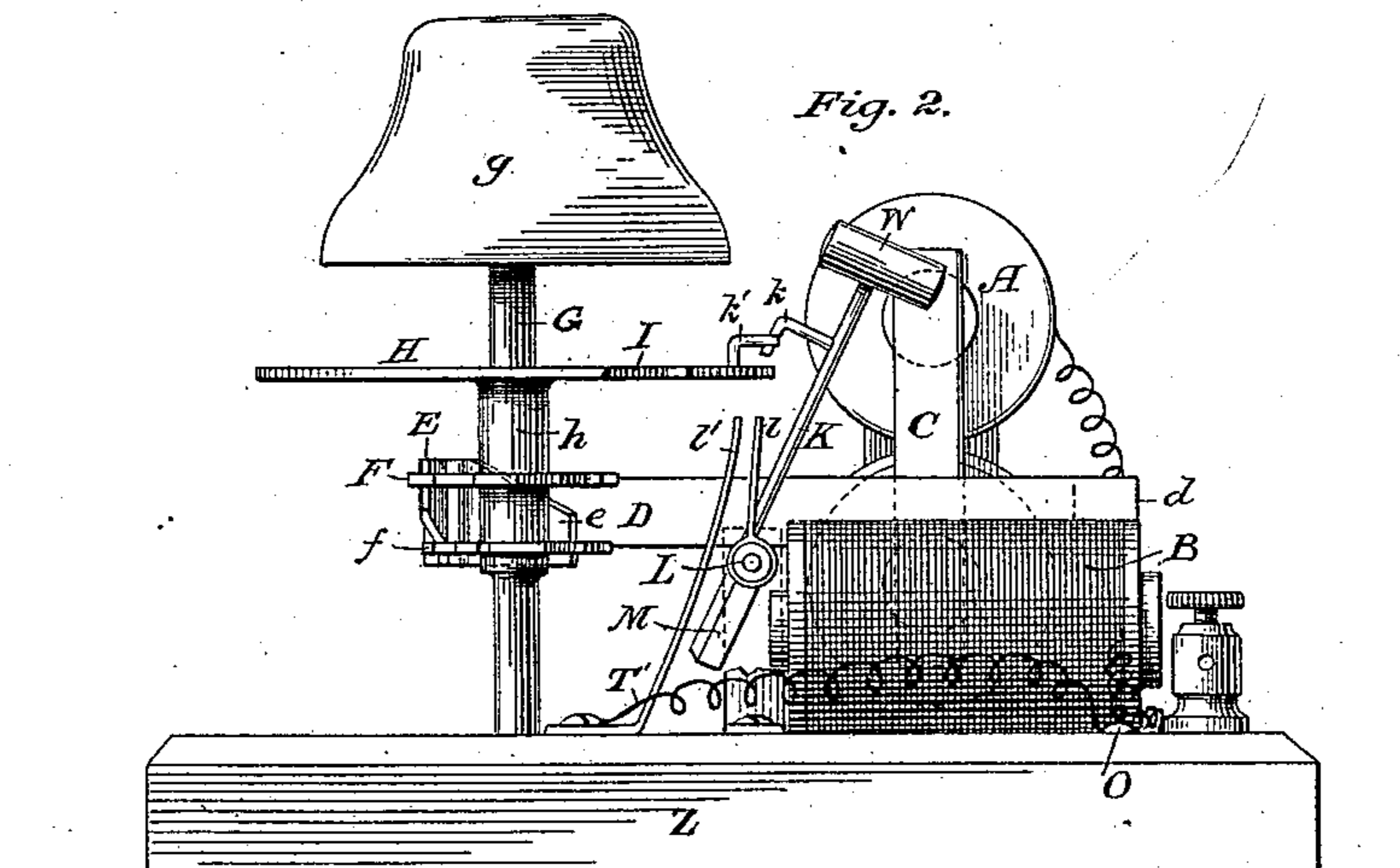
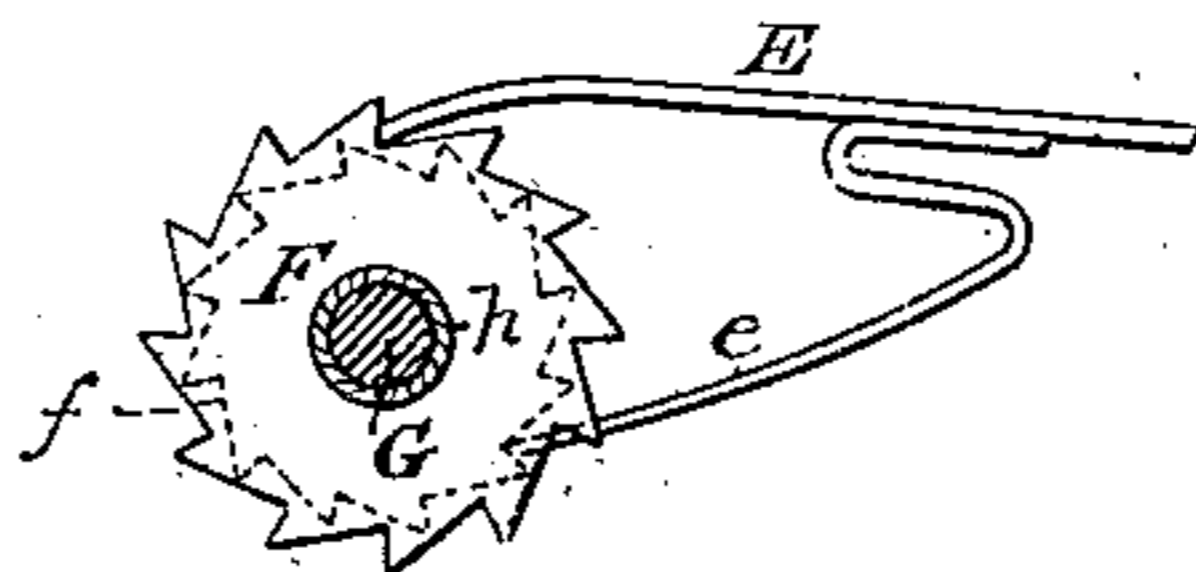


Fig. 3.



Henry C. Bliss

Inventor:

Witnesses:

C. Clarence Poole

R. F. Barnes.

UNITED STATES PATENT OFFICE.

HENRY C. BLISS, OF WEST SPRINGFIELD, MASSACHUSETTS.

TELEPHONE CALL-BELL.

SPECIFICATION forming part of Letters Patent No. 226,480, dated April 13, 1880.

Application filed November 20, 1879.

To all whom it may concern:

Be it known that I, HENRY C. BLISS, of West Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Signals for Telephone and Telegraph Lines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to

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which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

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The object of my invention is to call or alarm one of several stations on an electrical circuit without at the same time causing the call or alarm to be repeated at other stations than the one desired by the operator.

In the accompanying drawings, Figure 1 is a plan view of instrument; Fig. 2, end elevation; Fig. 3, detached view of double ratchet and pawl employed.

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Z indicates base of instrument. A and B are electro-magnets of such different construction or adjustment that the magnet B requires two or three times more battery-power to actuate it than is required to actuate magnet A. As the main circuit passes normally through the coils of both magnets A and B, they should

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be wound with wire offering the same resistance. The inequality of tension can be effected either by stationary coil B or by adjustment of armature.

D is armature-spring, carrying armature-plate C, and so fastened to post *d* that the spring normally bears away from the magnet. To this spring is hinged bifurcated pawl E, the branch *e* engaging a tooth of ratchet-wheel F at each impulse of magnet A, and thereby, by force of spring D, revolves disk H, to which the ratchets are attached. The branch *e'* impinges against ratchet-wheel *f*, and by arresting the motion of spring D limits the revolution of disk H to a space or distance corresponding with one tooth of ratchet F. The teeth of these ratchet-wheels are pitched in opposite directions, as shown.

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H is a graduated disk, divided into spaces corresponding to the position and number of teeth on ratchet-wheel F. The disk is formed to or connected with said ratchet-wheels by

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means of sleeve *h*, which freely revolves on post G, which post also answers to support bell *g*. On the circumferential edge of this disk is slot I, which admits the bell-rod to swing so as to ring the bell when the slot comes to proper position. Also, on the circumferential edge of this disk, under stud *k'*, is angular slot *i*, against the sloping side of which the bell-rod presses when swung forward to disengage the catch *k*, thus causing the disk to slightly revolve, and thereby carry the stud *k'* by the catch. This slot, however, is not deep enough to allow the bell to be rung at that point.

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K is a rod swinging on rock-shaft L, to one end of which is fastened the armature M of magnet B, and to the other end is fixed the bell-hammer. As the instrument is designed to be fixed to the side of a room, the bell-hammer falls away from the bell by force of gravity. The rock-shaft L has its bearings *p* and *p'*, and to it is attached the spring *l*. *l'* is another spring, being, like the rock-shaft, insulated upon the base-board of the instrument to which it is fastened, as shown. These springs are so adjusted that they touch and make an electric connection whenever the bell-rod swings forward in slot I, and just before the bell-hammer strikes the bell. When such a contact is made a short electric circuit is closed between binding-posts O and O' by way of said springs, rock-shaft L, bearing *p'*, and wires T and T'. This being the shorter circuit, the electric current will take this route in preference to that through the coils of magnet B. This change of condition will allow armature M to recede from its magnet, when the springs *l* and *l'* are again separated, the short circuit broken, and another impulse from magnet and stroke of bell will follow. In operation, the momentum acquired is sufficient to cause the bell to be struck after magnet B has been short-circuited by contact of *l* and *l'*, as shown.

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S is a signal-plate, which, being attached to spring D, moves from under screen *s* when the spring falls back from magnet A, which position the spring will assume when no current is passing. The signal-plate will therefore indicate the condition of the wire—as, for instance, that the batteries at central office are switched out, and that telephones are in use.

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P is a spring, against which the armature-spring strikes when drawn toward magnet A, and both prevents pounding of armature and, at a point where magnetic attraction is greatest, accumulates a power to re-enforce the spring D and aid in starting ratchet-wheels and disk.

N and N' are binding-posts, from which run the main wires of the line, and Q is a short wire, connecting binding-post N' with bell-post G, and when stud *k'* engages catch *k* a short circuit is made thereby through said wire Q, post G, disk H, stud *k'*, catch *k*, bell-rod K, rock-shaft L, bearing *p'*, and wire T. The disk H should be coated with some non-conducting substance to prevent a closing of the short circuit when the bell-rod touches it, and the pieces of mechanism herein described as forming portions of electric circuits should be constructed of materials which are ready conductors.

When the magnet A is short-circuited, as described, resistance is diminished and the operative power of magnet B is correspondingly increased. It will therefore be necessary to vary the use of the short circuit through Q as circumstances and the condition of the wire and instruments may require. The instrument is practically complete with this wire cut out, the only difference being that in one case the armature C and attachments will rest passive when stud *k'* and catch *k* impinge, and in the other the armature-spring will strike against ratchet-wheel F to no purpose.

The instrument at the central office may be of the same construction as those at the stations on the line, except at the central office a wire may project from the armature-spring D, with a light bell-hammer at the head, in such a manner that the bell *g* will be struck at each motion of armature.

As all the instruments may be supposed to be in a closed circuit through the light battery or a battery of sufficient power to work magnets A, the central office may be called from any of the stations by simply breaking the circuit in the usual manner.

The method of bringing into use the strong battery-current for the purpose of working magnets B and ringing a bell or unlocking the disks H when they have made one revolution need not be herein described.

Two keys so near each other that the operator can touch both at the same time can easily be so connected with batteries and line that the movement of said keys at the will of the operator may be made to break the circuit or switch in the large or strong battery.

The practical operation of this signal mechanism is as follows: Suppose there are two stations on the line. The machine at each station will have slot I in a different-numbered position—as, for instance, the disk of the instrument at the first station will have slot I

at that division of the circumferential edge of said disk designated by the figure 1. At the second station this slot will be at No. 2, and so on. Division numbered 10 represents no station, this being the point at which all the disks are arrested to secure unison, as described. Should the operator desire to call No. 7, he will first look at his instrument and see what number is against the bell-rod K. If this number be 3, he will break the circuit four times or send through the wire four impulses from the light battery. This will bring on all the instruments on the circuit the number 7 against bell-rods K; but only at station No. 7 is there a slot in that position. The bell at that station may now be rung as long as the heavy current is sent through the line. The response from the station called may be the breaking of the circuit and falling back of all the armatures, together with a stroke upon the bell at the central office.

To insure unison in the position of the several disks on the line, when the number 10 reaches the bell-rod and the motion of the disk is arrested the operator will work disk-magnets A one or two extra times to enable any laggard disk to catch up; then by switching in the heavy battery all will be simultaneously released.

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

1. The mechanism herein described, consisting of electro-magnets A and B, of unequal operative magnetic power, in connection with batteries of unequal tension, the magnet A operating by means of armature-spring D, double pawl E, and ratchets F and *f* to revolve and hold disk H, the magnet B operating to swing forward bell-rod K, either to ring the bell or release the disk from catch *k*, the disk H, provided with radial slot I and angular slot *i* and stud *k'*, the rock-shaft L, carrying armature M, bell-rod K, and spring *l*, the same having electric connection with main wire at binding-post O', the spring *l* having electric connection with main line at binding-post O, substantially as set forth.

2. The combination, with the disk H, provided with slot *i* and stud *k*, of bell-rod K, provided with catch *k'*, substantially as and for the purposes described.

3. The combination, with disk H and mechanism for revolving the same, of bell-rod K, rock-shaft L, magnet B, armature M, springs *l* and *l'*, and wires T and T', substantially as and for the purposes described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HENRY C. BLISS.

Witnesses:

W. J. JOHNSTON,
H. A. HALL.