

L. FINGER.
Electric Annunciators.

No. 146,758.

Patented Jan. 27, 1874.

Fig. 1

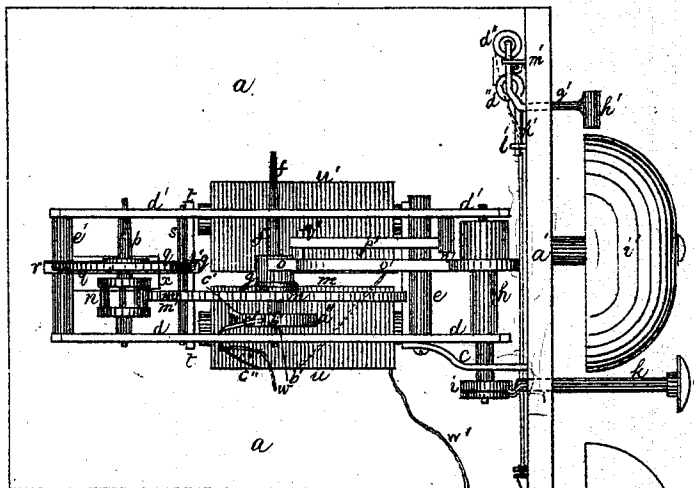
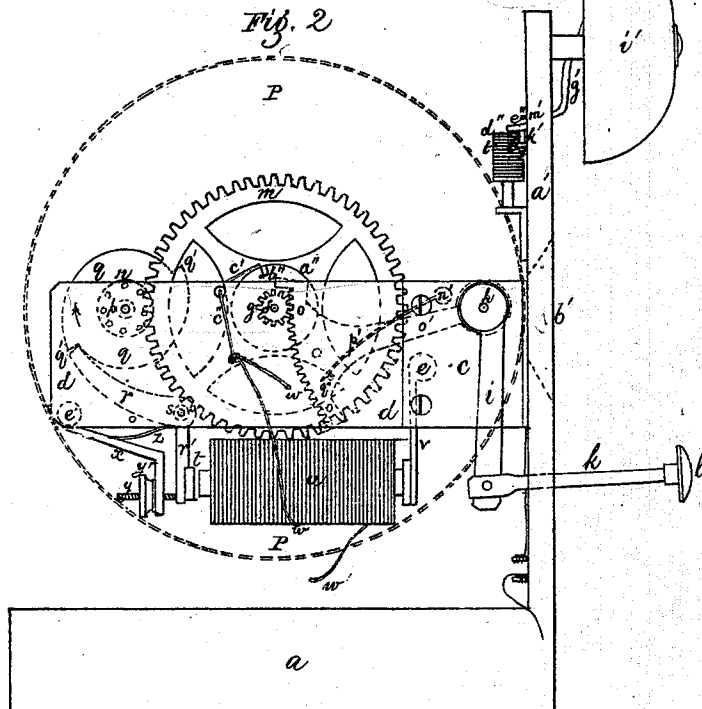


Fig. 2



Witnesses
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Louis Finger
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Carroll D. Wright

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Fig. 4

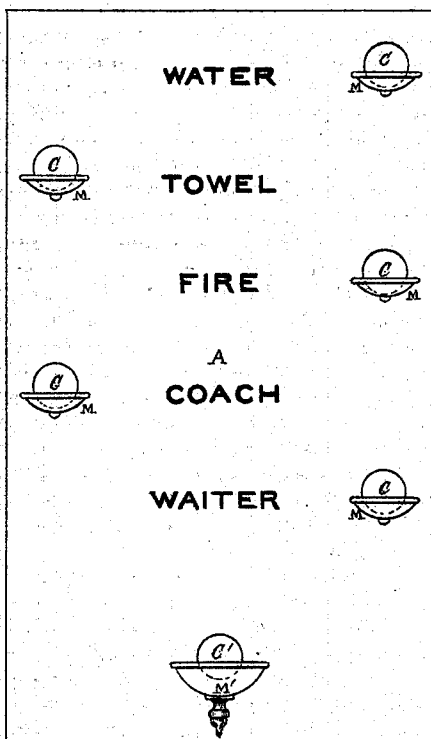


Fig. 5

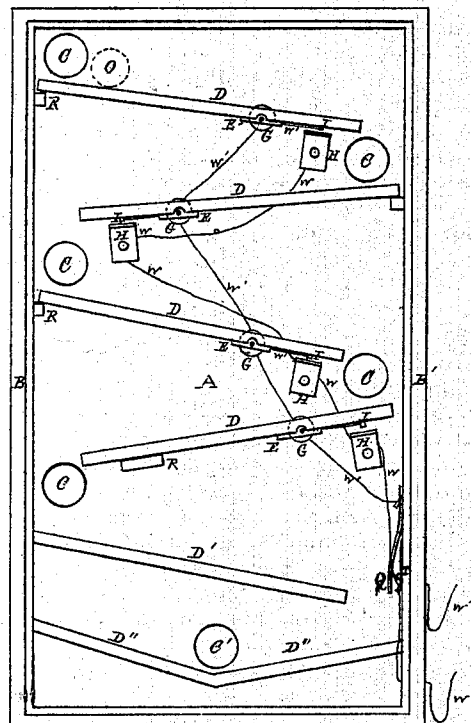
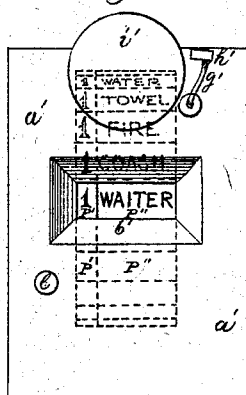


Fig. 3



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UNITED STATES PATENT OFFICE.

LOUIS FINGER, OF MELROSE, MASSACHUSETTS.

IMPROVEMENT IN ELECTRIC ANNUNCIATORS.

Specification forming part of Letters Patent No. **146,758**, dated January 27, 1874; application filed February 1, 1873.

To all whom it may concern:

Be it known that I, LOUIS FINGER, of Melrose, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Electro-Magnetic Annunciators, of which the following is a specification:

Figure 1 of the accompanying drawing is a top view, Fig. 2 is a side view, and Fig. 3 is a front or end view, of one portion of my improved annunciator. Fig. 4 is a front view, and Fig. 5 is a rear or interior view, of the other portion of my invention.

The present invention relates to certain new and useful improvements in electro-magnetic annunciators, having for their principal objects the providing of an annunciator economical in cost and construction, and simple and effective in operation, by which the article or person wanted is specified as well as the room from which the order is issued is announced; and the time and labor heretofore rendered necessary in the use of ordinary annunciators by the attendant being obliged to go to the apartment to ascertain the want of the occupant, and then to obtain and return with the desired article, and the expense of the number of servants employed on account of the time thus required, are greatly diminished. Also, by the employment of a single annunciator to indicate a number of articles or persons and the number of the room or place from which the order is given, to save the expense and prevent the liability of the disarrangement of the operation heretofore incurred, when more than one article, &c., was to be indicated, by the use of a separate annunciator for each article, &c., desired. My invention consists of an annunciator composed of two separate portions, each arranged and operated, as will be hereinafter more fully described, so that a ball or other suitable body inserted through an aperture formed in a frame containing one portion of the annunciator and situated in any desired apartment or place, and provided with several other like apertures, each properly designated to correspond to the wants required, descends a series of inclined planes or movable levers, and, as it approaches the end of each lever or plane, brings a metallic pin or stem, connected with the bottom of the lever and with one wire of an electrical battery; in contact with a me-

tallic plate connected with the other portion of the annunciator and the opposite wire of the battery, or the wires of the stem and plate may be arranged vice versa, and closes the electrical circuit by which a series of mechanical devices, to be hereinafter duly explained, are operated so as to strike a bell and partly revolve a cylinder or drum, arranged on its periphery, with blanks, names, and numbers, as will be duly explained, to the proper distance required to bring to view the number of the room and the name of the article or person wanted. The plane or lever being released after the passage of the ball or other body, which is finally deposited in a receptacle prepared to receive it, and the electrical circuit opened, leaving the cylinder or drum in the position desired until turned back to its original position by the operation of a series of mechanical devices, that will be more fully described in due course.

A modification of my invention consists in a series of stationary inclined planes arranged at opposite angles in a frame provided with apertures opening onto the upper ends of each plane, and having a metallic spring attached at one end of and a metallic stem or pin connected with the side of the interior of the frame, the stem or pin and spring being suitably connected with the opposite wires of an electrical battery and with the other portion of the annunciator, so that a ball or other body descending from one plane to the other presses the spring against the pin or stem and closes an electrical circuit, by which the cylinder or drum of the annunciator is operated in the same manner as by the former arrangement.

In the drawings, *a* represents the bottom, and *a'* the face, of the case of one portion of my improved annunciator, which is provided on the front with an aperture, *b'*, and to the interior of which is attached, by a standard, *c*, or otherwise, a frame, consisting of two longitudinal plates, *d d'*, connected by rods or bars *e e'*, and supporting, in the center near the top, the ends of a shaft, *f*, carrying a ratchet-wheel, *g*, with which engage the teeth of a ratchet-sector, *o*, formed with a lever-arm, *o'*, connected with a shaft, *h*, supported by the sides *d d'*. Attached to one end of the shaft *h* is a vertical arm, *i*, that is pivoted at the bottom to

and operated by a horizontal lever, *k*, that extends through the face of the annunciator, and is provided with a cap or knob, *l*. The ratchet-wheel *g* is attached to or formed on the outside of a gear-wheel, *m*, the teeth of which engage with a pinion, *n*, connected with a shaft, *p*, that is supported in the sides *d d'*, near the rear of the frame, and which revolves a cam or escape wheel, *q*, formed with two or any desired number of projections, *q'*, that are held or released by a curved arm, *r*, of a bell-crank lever connected with a rod, *s*, the ends of which turn in and are supported by the sides *d d'*. The vertical portion *r'* of the lever *r* extends downward, and connects with an armature, *t*, arranged horizontally opposite the ends of an electro-magnet, *u u'*, situated at the bottom of the frame *d d'*, and supported at the other end by a bar, *v*, connected with the bar or rod *e*. The magnet *u u'* is supplied with wires, one of which, *w*, connects with an electrical battery, and the other with a caller or other portion of the annunciator; or the wire *w* may connect with the caller and the wire *w'* with the battery. Attached to the bar or rod *e'* is a bent arm, *x*, in the lower portion of which is a screw, *y*, operated by a thumb-screw and binding-washer, *y'*, so as to press against and be released from the arm *r'*, and properly adjust the arm *r* in relation to the cam or escape wheel *q*. Connected with the bottom of the armature-lever *r*, and bearing on the top of the bent arm *x*, is a spring, *z*, for the purpose of bringing the armature-arm *r* in position after its release from the cam *q*. Connected with the shaft *f*, between the gear-wheel *m* and the frame *d*, is a rubber, ivory, or other insulated wheel or disk, *a''*, in the periphery of which is inserted a piece of metal, *b''*, that connects, by a wire, with an electro-magnet, *d''*, supported on the interior of the case, and whose armature *e''* is formed by the lower horizontal portion of a bent rod or arm, *g'*, that passes through the face *a'*, and operates a hammer, *h'*, connected with its other end, against a bell or gong, &c., *i*, attached to the outside of the case over the aperture *b'*, or situated in any other desired position. The armature *e''* is kept in proper position by a spring, *k'*, held at one end by a pin, *l'*, the other end bearing against the bottom of the armature *e''*, the top of which is prevented from moving beyond its desired point by a pin, *m'*, situated over it; or the armature may be regulated by any other method that may be desired. Bearing on the top of the wheel or disk *a''* is a metallic spring, *c'*, that connects, by a wire, *c''*, with the caller-wire. Connected with the side *d'*, on the inside, is a stem, *n'*, that holds one end of a bent spring, *p*, the other end of which bears on the top of a pin or stem, *q''*, attached to the side of the ratchet-sector *o*, so as to press the sector down and operate the shaft *f*, and turn the wheels *g*, *m*, and *a''* and cylinder *P* in a forward direction, and revolve the cam *q* in the opposite direction.

The other portion of my improved annun-

ciator is designated the "caller," the face of its frame being represented in the drawing by the letter *A* and its sides by *B B'*. The face *A* is formed with apertures *C*, arranged alternately one above the other, on each side, and just above the opposite ends of inclined levers or planes *D*, arranged at opposite angles with each other, and provided on the bottom, near the lower ends, with a metallic plate, *E*, formed with a socket to receive a pivot attached to the face of the frame, and on which the inclined lever or plane turns, and connected with which is a metallic disk, *G*, connecting, by a wire, *w'*, with the annunciator or other portion of the apparatus, or with the battery. Attached to the interior of the face *A* are right-angled standards *H*, situated forward of plates *E*, nearer the lower ends of the levers or planes *D*, and extending horizontally, at the top, under the bottom of the levers or planes *D*, which are provided, just above the horizontal portions of the standards *H*, with metallic stems or points *I*, connected with the wire *w'* communicating with the other portion of the annunciator, or with the battery. Connected with the standards *H* is a wire, *w*, that communicates with the battery, or with the annunciator, according as the wire of the stem *I* is connected, the stems and standards being made to connect with opposite wires. The bottoms of the upper ends of the levers or planes *D* rest, when at ease, on blocks *R* attached to the interior of the sides *B B'*. At the bottom of the interior of the frame *A* are two stationary inclined planes, *D''*, joined at the center, and sloping inward toward the front, so as to conduct a ball or other suitable body, *O*, that operates down the inclined levers or planes *D*, as will be duly explained, through a bottom aperture, *C'*, into a cup or receptacle, *M'*, arranged on the outside of the face *A* to receive and hold the ball or other body *O* when not in use. The apertures *C* are suitably lettered or otherwise designated to indicate the articles or persons desired, and are provided on the outside with projecting cups or receptacles *M*, in any one of which corresponding to the want required the ball or other body *O* is deposited. Connected with and revolved by the shaft *f*, and extending over the frame *d d'*, Figs. 1 and 2, is a cylinder or drum, *P*, Figs. 1 and 3, arranged on the periphery in two parallel rows of spaces, *P' P''*, the spaces of one row, *P'*, consisting of a blank and numbers corresponding to the number of the room connecting with the annunciator, and the spaces *P''* of the opposite parallel row containing a blank and the names of the articles or persons corresponding to the names against the apertures *C*.

The operation of my invention is as follows: The annunciator, or that portion of my invention represented by Figs. 1, 2 and 3, is placed in the servants' hall, office, or in any other place convenient to the attendant, and the caller, or that portion of the invention represented by Figs. 4 and 5, is placed in any apartment or place from which an order is to

be given. The wires $w w'$ of the magnet $u u'$ connect, respectively, with an electrical battery, and with the caller, whose other wire communicates with the opposite wire of the battery, so that, when an order is given, the ball or other body O is taken from the receptacle C' and placed in the desired receptacle C , against which the required want is indicated, and from which it passes through its corresponding aperture and descends the inclined lever or plane D adjacent to the aperture, and, as it passes the fulcrum of the lever, tips by its weight the pivoted end of the lever or plane, so as to bring the metallic pin or stem I and its wire w' in contact with the horizontal portion of the standard H and its wire w , and close the electrical circuit, thereby causing the armature t to be attracted to the magnet $u u'$, thus operating the armature-lever r , so as to free the cam or escape-wheel g , which makes a half-revolution, or as many partial revolutions as the cam is formed to allow, and permits the gear-wheel m to be revolved by the downward action of the ratchet-sector O , induced by the pressure of the spring p' on the stem or pin q'' , a distance determined by the number of the teeth or spokes of the pinion n connected with the shaft p that operates the cam or escape wheel g , and the number of the teeth of the gear and ratchet wheels m and g . Thus, if the pinion n has eight teeth and the gear-wheel m fifty-six, the gear-wheel m , and, consequently, the cylinder or drum P , operated by the same shaft, f , will revolve one-fourteenth of its circumference. If a greater or less number than fourteen partial revolutions are desired, the train must be arranged accordingly—that is, if thirty partial revolutions are required, the escape-wheel or cam g may be made with three projections, the pinion with nine teeth, and the gear with ninety teeth. Thus, the number of partial revolutions may be increased or diminished by increasing or diminishing the teeth of the train and the projections of the cam or escape wheel. The ball or body O , as it passes from one lever or plane to the other, releases the lever or plane and disconnects the wires $w w'$ of the plate H and stem I , and opens the circuit, thus leaving the cylinder at rest until the circuit is again closed by the passage of the ball or body O over the fulcrum of the next lever. Thus, it will be seen, that the cylinder P is partially revolved each time the ball passes down a lever or plane, so that if the ball be put through the lowest aperture C it will descend only one lever, and, consequently, the cylinder P , which is set at blank, will be partially revolved once, thereby bringing into view, through the aperture b' , the number of the room from which the order is given, and the name of the article or person corresponding to the name of the article or person set against the aperture C , through which the ball or body is inserted. If the ball, &c., is deposited in the aperture C , next above the bottom one, it will descend two levers or planes, and, consequently, cause two

partial revolutions of the cylinder P and bring into view the number of the room and the name of the article, &c., corresponding to that set against that aperture, and so on. As many levers or planes may be arranged, apertures formed, and articles or persons indicated as there are partial revolutions provided for the cylinder. When the ball or body has passed the requisite number of levers or planes, and the cylinder has been turned the required number of times to indicate the article desired, it descends the inclined plane D'' , and is directed by the lateral incline of the planes into the bottom receptacle M' , and the cylinder P remains at rest until the order has been attended to, when the attendant, by pushing in the lever k that actuates the arm i , so as to turn the shaft h and operate the ratchet-sector o , which revolves the train in an opposite direction and sets the cylinder P back to its original position—that is, so that the parallel blank spaces will be shown through the aperture b' . From whatever room or place the order is given, or whatever the order may be, the bell or gong, &c., i' , is immediately struck by the action of the first lever operated, which brings in contact the wires $w w'$ of the caller, one of which communicates with the metallic spring c' connected with the battery or the magnet d'' , and bearing on the insulated disk a'' , which, when revolved by the shaft f , brings the metallic piece b'' , connected with the magnet d'' or the battery, in contact with the spring c' , thus closing the electrical circuit and causing the armature e'' to be attracted to the magnet d'' , thereby operating the hammer h' against the gong, &c., i' .

In the modification of my invention, the inclined planes D' of the caller are permanently attached to the face A , one above the other, at opposite inclinations, and a metallic spring, Q , is attached at one end to the side of the frame opposite the lower ends of the inclined planes, so that the ball O or other body, in passing from one plane to the other, comes in contact with the spring Q , connected with one of the wires $w w'$, and presses it against a metallic pin or stem, T , attached to the side of the frame and connected with the opposite one of the wires $w w'$, thus bringing the wire of the spring Q in communication with the wire of the stem T and closing the circuit, which is opened by the release of the spring Q by the fall of the ball onto the lower plane, and thereby operating the cylinder P and bell, &c., in the manner hereinabove described.

Instead of arranging the caller with apertures or receptacles, as hereinabove described, it may be arranged to allow of the descent and return of the ball; and the lever or plane, or each section thereof, may be supplied with a ball or other body, restrained and released by sliding valves or plates, &c., or turning flaps or plates, operated from the outside by levers arranged to shove in and out of the frame, or by thumb-screws and stems arranged to turn the flaps or plates up or down, or by any suit-

able arrangement of devices that may be preferred for holding and releasing the ball, &c.

The inclined levers or planes D, instead of turning on a pivot, as shown and described, may be hinged or connected with a spring at one end, or arranged in any other desired manner, to allow the stem or pin I to be brought in contact with and released from the top of the standard H.

The levers or planes D may be pivoted, and the standards H may be situated near the upper ends of the levers, so that the standard H and stem I may be brought in contact, and an electrical current produced as soon as the ball touches the upper end of the lever.

Having thus fully described my improvements, what I claim as my invention, and desire to have secured to me by Letters Patent, is—

1. In an annunciator, the combination of a series of inclined planes or levers, circuit-closers controlled by the passage of a weight or ball from one plane or lever to another, and of the mechanism for operating the alarm and indicating cylinder, substantially as described.

2. The ratchet-sector *o*, connected by the lever-arm *o'* to a shaft, *h*, and depressed by a spring, *p'*, in combination with the train *g m*, the latter operating the indicating-cylinder of an annunciator, substantially as described.

3. The cam or escape wheel *g*, held and released by the lever *r r'*, armature *t*, magnet *u u'*, in combination with train *g m* of the indicating-cylinder, substantially as and for the purpose specified.

4. The combination of the ratchet-sector *o*,

constructed as described, with the arm *i* and lever *k*, for carrying the indicating-cylinder back to its original position, substantially as described.

5. The wheel or disk *a''*, of insulating material, provided with a metallic conducting-piece, *b''*, in combination with the metallic spring *c'* bearing on its surface, said spring being connected with a battery operating an electro-magnet, *d''*, and armature *e''*, by which a bell or gong is struck at every contact of the piece *b''* and spring *c'*, substantially as described.

6. The face of the collar of an annunciator, having apertures C C' and receptacles M M', arranged to receive a device for operating a circuit-closer, substantially as specified.

7. Inclined planes D'', arranged at the bottom of the caller, and meeting at the center, and sloping inward to direct a ball or other movable body through the aperture C' into the receptacle M', substantially as specified.

8. A caller of an electro-magnetic annunciator, having apertures C C', properly designated by the name of the article or person desired, and provided with suitable cups or receptacles M M' on the outside, and in the interior with inclined levers or planes D D' D'', all arranged and operating substantially as described.

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

LOUIS FINGER.

Witnesses:

CARROLL D. WRIGHT,
SAML. M. BARTON.