(No Model.)

P. SEILER.

INDIVIDUAL ALARM SIGNAL APPARATUS.

No. 479,308. Patented July 19, 1892.

Fig. 1.

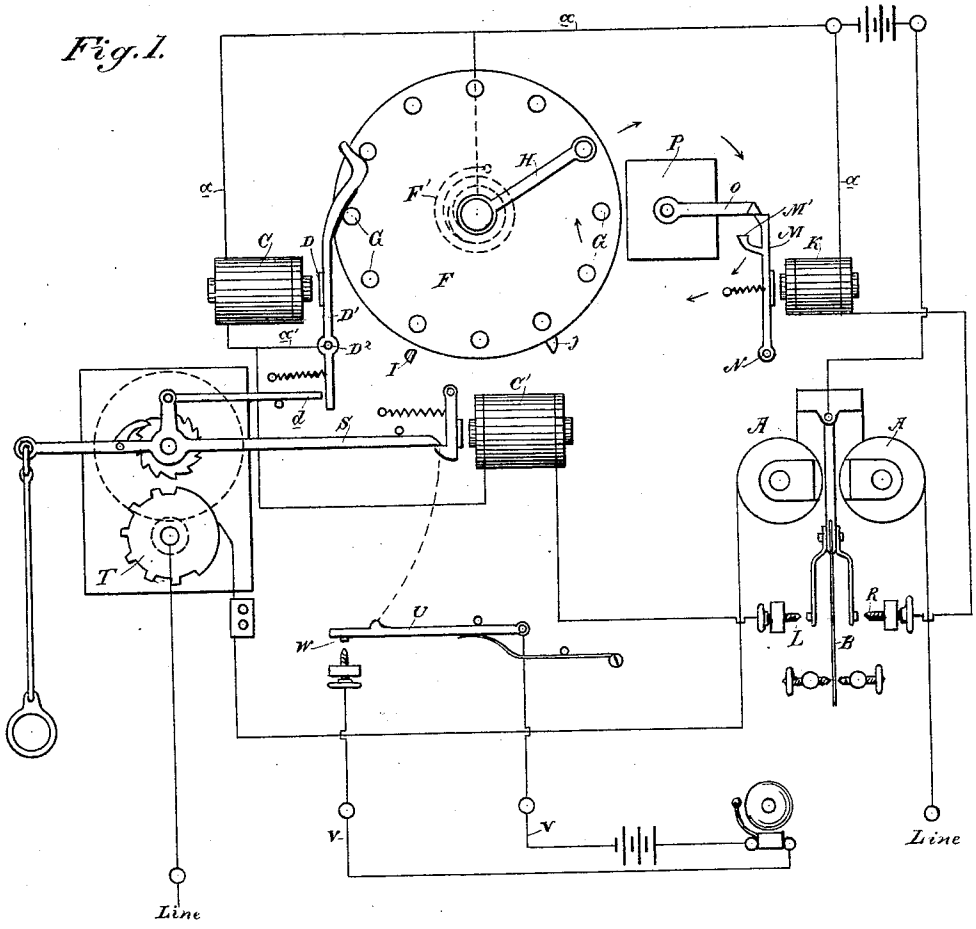


Fig. 2.

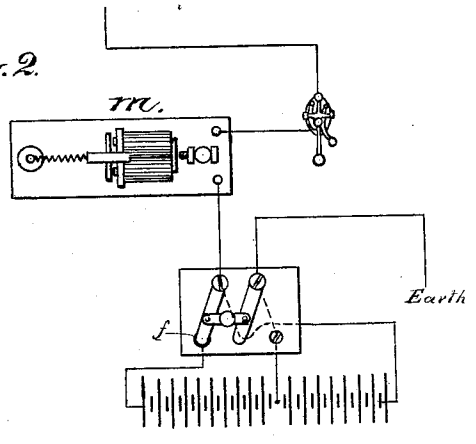


Fig. 3.

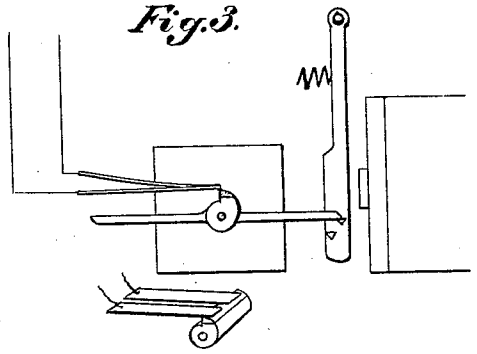
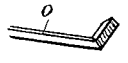


Fig. 4.



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INDIVIDUAL ALARM SIGNAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 479,308, dated July 19, 1892.

Application filed August 1, 1891. Serial No. 401,403. (No model.)

To all whom it may concern:

Be it known that I, PAUL SEILER, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Individual Alarm Signal Apparatus; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device which I call an "individual alarm signal apparatus." Its object is to obtain a special connection between two offices for telegraphic, telephonic, or other purposes; and it consists in the employment of a polarized relay the armature of which is adapted to stand in three different positions; a disk containing a number of pins, the movement of this disk being effected by clockwork and governed by a magnet; another magnet the armature of which acts both as a pawl and short-circuiting device, and a third magnet with an armature; and a releasing device for automatic mechanism and the establishing of a contact to operate any alarm or signal which may be connected therewith, and in certain details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a general view of the entire apparatus. Fig. 2 shows the arrangement at the central office or from which the signal or alarm may be set. Fig. 3 shows a plan by which a switch may be opened or closed by means of releasing mechanism. Fig. 4 is a view of the end of lever O.

In railroad-telegraphing, where it is often required to call the agent at night, the ordinary call from the instrument at the office would be annoying and would necessitate the operator being on the spot at all times, while at many isolated stations it is not necessary to call the operator except on special occasions. By the employment of my device the operator may live at any distance away from the office and when he is wanted at the instrument a special call will operate a signal or alarm conveniently located. The invention is also serviceable for calling policemen to their station, to light a lamp, or to operate colored shades or glasses, to switch on an electric light, or ring a bell for policemen to come to the nearest police-box for orders, while in telephone service it may be used to call up any desired station without alarming any other, and as the operator in the central office is always on duty a simple call from any of the other stations will attract the attention of the central office without giving a sound at any other station except the central. This is especially useful on telephone-lines that connect towns where there are many stations on the same line.

In Fig. 2, *m* is an ordinary Morse telegraph sounder or relay, which is common in the general arrangement of a telegraph-line. In the present case it is operated when the lever S is released, and said lever in turn acts through the ratchet and clock mechanism upon the circuit-wheel, which has the same number of teeth as the number of pins upon the disk, indicating the number of the station. This action is precisely that of a district box and will cause the sounder or relay *m* to tap, and thus show that the signal has been made at the proper station.

A is a polarized relay the armature of which is so constructed that it may assume three different positions. First, when the coils are not charged the armature by means of a thin flat spring B will overcome the permanent magnetism and remain in the center and not touch either of the contact-screws. When charged with the current flowing in one direction, it will make contact on one side, and when the current is broken the armature will assume a central position, not touching either contact. On reversing the current of the line-battery, the armature will move to the opposite side and act likewise to form a contact on that side.

C is an electro-magnet having an armature D mounted upon a lever D′, which is pivoted or fulcrumed at D^2. The upper end of this lever serves as a pawl and engages pins G, which project from the face of the disk F, which disk is made of vulcanized fiber or other insulating material and mounted upon a shaft having a coiled spring, as shown at F′. This spring acts to turn the disk to the right when free from the pawl until the lug J upon the rim of the disk strikes a stop at I,

which I call the "unison stop," and which is the starting-point for the revolution of the disk.

H is a metal strip connected with the shaft of the disk F and also connected with one of the pins G. This metal strip is connected through the shaft with the wire *a*, leading to magnet C. The lever D′ connects with the other side of the wire *a*′, leading to magnet C, so that if the metal strip H is connected to one of the pins and that one pin strikes the lever D′ contact is made, and the magnet C is short-circuited as long as the pin is in contact with strip H and resting on it and the lever D′.

K is another electro-magnet connected with the conducting-wire *a* and acting upon the armature of a lever M, which is fulcrumed, as shown at N. The upper end of this lever serves as a stop upon which the end of the arm O rests when the lever is in its normal position and the armature out of contact with the magnet. The arm O is made, as shown in Fig. 4, with the end bent at right angles, this end resting upon the top of the lever M.

M′ is an arm projecting from the side of the lever M and serving as a second stop upon which the end of the lever O drops when released from the first stop at the upper end of the lever M, the two thus acting as an escapement. This lever O is mounted upon a shaft within a box P, containing a clockwork mechanism by which the lever O is caused to revolve when released. When the current passes through the electro-magnet K, it attracts the armature, moving the lever M and releasing the arm O from the top or first stop of the lever, when it is arrested upon the second stop M′ and is released from this stop when the armature is released from the magnet, the two steps of release thus taking place with the one movement by which the armature is first attracted to the magnet and then released therefrom. This escapement action takes place each time when the key in the office of the operator is touched, and as the arm O is released each time the key is touched it makes a single revolution. In its revolution it engages one of the pins G upon the disk F, and thus moves the disk forward one pin at each release of the armature of magnet K. The armature-lever D′ acts as a pawl; but the disk F can be moved, because the detent is so beveled that it will allow the pin to press it back and slide beyond the detent when the disk is rotated by the action of the arm O. The magnet K will respond to any contact made by the polar relay and move the disk. The armature-lever D′ only acts as a pawl; but on reaching the pin connected with arm H, indicating the number of this instrument, the polar relay is caused by reversal at the battery in Fig. 2 to operate the local current through magnets C and C′; but as magnet C is short-circuited by the pin and arm H and the armatare D′ the magnet C′ only will act and drop the lever S, which in its descent, by means of the lever *d*, strikes the armature D′ and allows the disk to set back at unison by disengaging the detent from the pins of the disk.

The operation will be as follows: To be able to call a certain office on a Morse telegraph-line where one direction of current is used only, the operator or train-dispatcher opens the key, reverses the battery on his end of line, and at the same time introduces another battery (which can be an open-circuit battery) by switch or current reverser, (shown at *f*,) after which he taps his key a number of times, corresponding with the number the instrument he wishes to operate is set for. The drawing representing No. 7, he taps key seven times, thereby operating all these signal-instruments on the line seven spaces. The one that has the connection between the seventh pin H and armature E short-circuits the magnet C and holds contact. The operator after giving seven taps will leave his key open until he restores the battery to its usual direction and then close his key. Upon closing it all the instruments on the line will operate their armatures of polar relays A to close on opposite contacts at L, and all the magnets C, operated by the local contact L, will attract their armatures, release the levers D′, and allow disks F to fly around to the stop-pins I by the action of springs F′, thereby having a uniform position at unison. The magnet C′, being of lower resistance than magnet C and having more work to perform, cannot drop levers S except for the one instrument having the contact-pin G and armature-lever D′ in connection, thereby short-circuiting magnet C and reducing the resistance in the local circuit, allowing the magnet C′ to act and dropping the lever S, which lever, being the stop for the automatic return-signal, allows the mechanism to start, and the revolving character-wheel T, having the number of its instrument, will automatically make and break circuit on the main line corresponding with its number to answer back to indicate that signal has been operated. Lever S, descending, strikes lever U and closes the contact-maker at W, making connection for a bell or signal circuit V independent of all other instruments. Now as the magnet C on this instrument is short-circuited and could not be charged to release itself the lever S in descending carries an arm *d*, which will strike the lower part of armature-lever D′ of magnet C and release the disk F by allowing the pins G to pass the pawl and the disk can fly around to its unison like all the other disks in instruments on the line. It will be seen by this that the number of the instrument to be set corresponds with number of contacts made by reverse battery and number of instrument to be set.

As it is highly important that signals or alarms should only be sent by chief operator

or train-dispatcher to any of those offices, it will be seen that this apparatus can only be operated from those stations having control of the battery and a suitable current-reversing switch.

On railroad-telegraph lines or any other telegraph-circuit the polar relay may take the place of an ordinary relay and the magnet C take the place of the sounder, if desired.

Fig. 2 shows the main office, from which calls are transmitted. The battery employed being the usual gravity-battery may not all be able to be reversed, as half the battery may be located on the other end of the line. In that case those cells available may be reversed and an additional open-circuit-battery power may be employed in conjunction with the available line-battery to overpower the battery on the other end of the line. The ordinary key and relay remain as usual. The pole-changer and combined battery-multiplying switch is introduced. In this figure the position of the levers *f* shows the gravity-battery and open-circuit battery connected in one series, the key being thrown open beforehand, so that no extra contact or break is made until the key is operated and the number of contacts made with one direction as to polarity of the battery, after which the switch or pole-changer *f* is moved over, as shown in the dotted lines, in which position it will restore the battery, as before, the gravity-battery being normal and the open-circuit battery disconnected on one side or at the button *f*.

The switch or pole-changer in Fig. 2 is at central office, and when battery is so directed as to work the Morse signals on the line the polar relay works the local on the side where the magnets C and C′ are connected. The magnet C, being of higher resistance than C′, will work its armature or detent, which thereby releases the disk, and the disk flies back to the unison and will remain there, no matter how often the magnet C is worked. When the operator at central station wishes to call, he reverses battery on the line by pole-changer, and on then tapping the key the polar relay will make the local circuit through magnet K, and for every contact K will tap once, and thus set the disk to desired number of the instrument, which, if battery on line is again reversed and key closed, works magnets C and C′ on the local contact, (magnet C′ first, because magnet C is short-circuited;) but on dropping the lever at magnet C′ the bar S will push the arm *d* and the armature of the magnet C, and push that also, and release the disk and allow same to fly back to unison. The pin H, which comes in contact with armature D′, is different in every instrument on the line, as it designates the number, and even should there be more than a dozen instruments only one is in contact and only one can drop the lever S on instrument called.

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

1. The rotary disk with projecting pins, a lever and clock-train, an escapement and controlling electro-magnet by which the disk is advanced one interval at each movement of the armature, a second magnet with an armature which actuates a stop engaging the pins at each movement, and a connection from the circuit-wires through one of the pins, whereby a short circuit is established through this pin and the stop when they are in contact and the magnet is thrown out of action, substantially as herein described.

2. The magnet C and its armature, the rotating disk and a pin by which the electrical current is diverted from the magnet, a return-signal mechanism, and a second magnet by which it is actuated when the current is diverted from the first magnet to pass through the second, substantially as herein described.

3. The magnet C with its armature, the rotating disk and a pin by which the electrical current is diverted from the magnet, a return-signal mechanism, and a second magnet by which it is actuated when the current is diverted from the first magnet to pass through the second, a contact maker and breaker, and a releasing device to free the first armature, substantially as herein described.

4. A return-call mechanism consisting of two magnets of different resistances within the same circuit, a mechanism operated when the call is made, whereby the magnet if of higher resistance is short-circuited and the second magnet is thrown into action, a return-signal, and a device to return the armature of the first magnet, actuated by the second magnet when it is thrown into action, substantially as herein described.

5. A return-call mechanism consisting of a polarized relay in the main circuit, contact-points L and R, to one or the other of which the armature is attracted by a reversal of the current, and a spring by which it is returned to a central position when the current is cut off, a mechanism actuated when the call is made, whereby one of two magnets of different resistances is short-circuited and the other is thrown into action, a contact-maker operated by the second magnet to produce a return-signal, and a device whereby the armature of the first magnet is released, substantially as herein described.

In witness whereof I have hereunto set my hand.

PAUL SEILER.

Witnesses:
S. H. NOURSE,
H. F. ASCHECK.