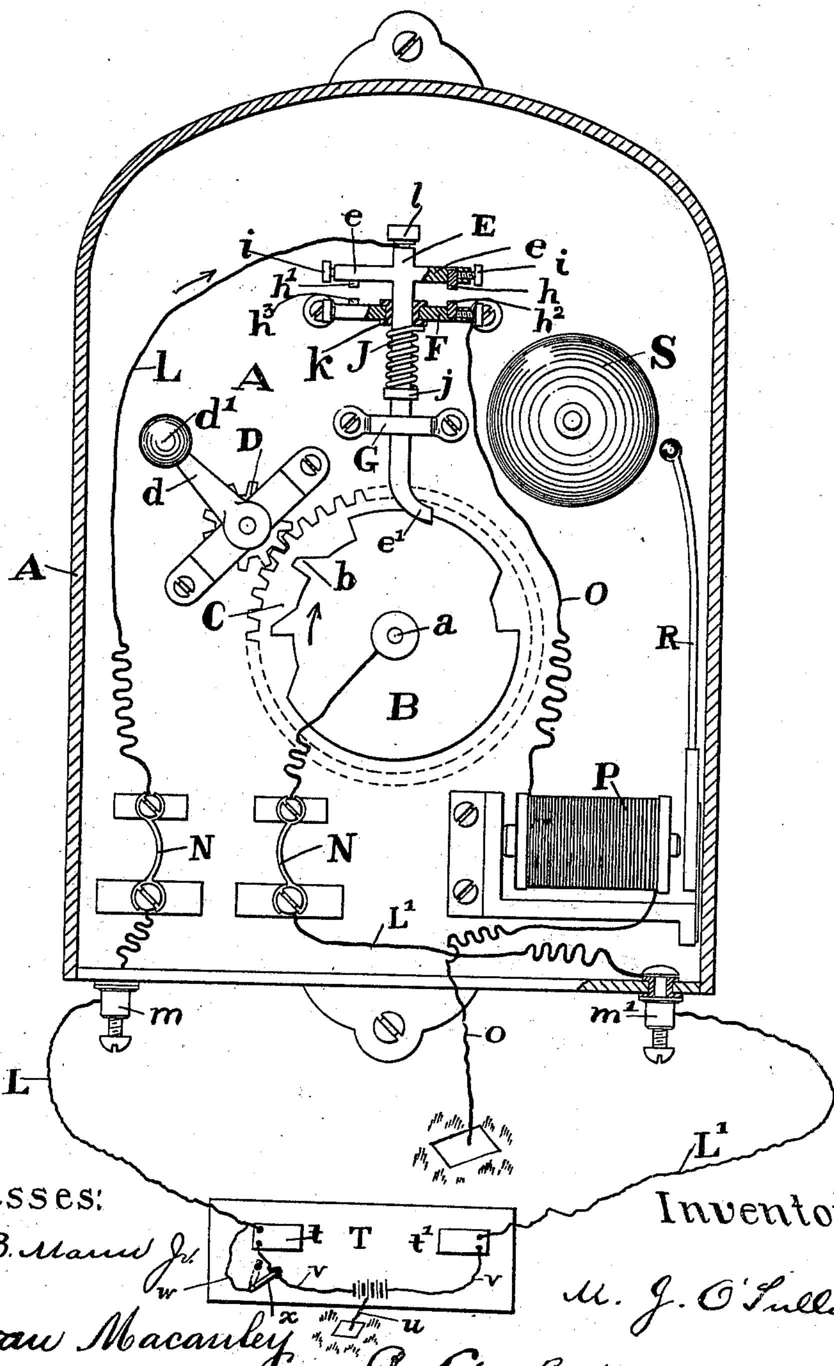
(No Model.)

M. J. O'SULLIVAN.

FIRE ALARM TELEGRAPH SYSTEM.

No. 513,526. Patented Jan. 30, 1894.



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FIRE-ALARM-TELEGRAPH SYSTEM.

SPECIFICATION forming part of Letters Patent No. 513,526, dated January 30, 1894.

Application filed June 7, 1893. Serial No. 476,826. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL J. O'SULLIVAN, a citizen of the United States, residing at Baltimore city, State of Maryland, have invented certain new and useful Improvements in Fire-Alarm-Telegraph Systems, of which the following is a specification.

My invention relates to an improvement in fire alarm telegraph systems wherein a number of sub-stations are in circuit with a principal station, and a signal being turned in at one of the sub-stations will be recorded at the principal station and the relay bell at the sub-station will repeat the signal as turned in at the principal station. The relay bell at the sub-station is not in circuit except when a signal is turned in from the sub-station, in which case the relay bell is thrown in automatically and will repeat the signal as turned in at the principal station. After the alarm has been sent in to the principal station and the circuit breaking wheel is returned to its normal position the ground is thrown out to so remain until another signal is turned in.

In the drawing the principal station and one of the boxes which form the sub-stations is shown with the cover of the box off, exposing the mechanism within the box.

Referring to the drawing the letter, A, indicates the box or casing in which the signal mechanism is contained.

B, indicates the circuit-breaking wheel which is located on a pivot, *a*, running transversely through the casing, A. A gear-wheel, C, is also located on pivot, *a*, and the circuit-breaking wheel, B, is rigid with respect to the rotation of the gear-wheel, C. A pinion, D, meshes with gear-wheel, C, and a crank, *d*, and handle, *d'*, are attached to the pinion for operating the same and thus indirectly to operate the gear-wheel, C, and circuit-breaking wheel, B. The gear-wheel and pinion are employed in order that the circuit-breaking wheel may not be so rapidly rotated as to make the separate strokes of the signal as received at the principal station undistinguishable as might be the case were the handle attached directly to the circuit-breaking wheel, B.

The principal station, T, as shown comprises the relays, *t*, and, *t'*, the wires, *v*, *v'*, leading from the relays to the battery, and the ground wire, *u*, from said battery. There are cut-outs employed in connection with the relays,—one of them, *w*, being shown as cutting out the relay, *t*. A switch-lever, *x*, controls the cut-out.

The contact-bar, E, slides through a stationary bearing in the guide-piece, F, secured to the casing, A, and through another bearing, G, thus maintaining said contact bar in an upright position. Near its upper end the contact-bar has two cross-arms, *e*, each having a recess near its end, and carbon contact-pieces, *h*, *h'*, are fitted within the recesses and secured therein by means of set-screws, *i*. The guide-piece, F, has recesses and carbon contacts, h^2, h^3, corresponding to those in the cross-arms, *e*, and in the depressed condition of the sliding contact-bar the carbon contacts, *h*, h^2, and, *h'*, h^3, are respectively in contact. A spiral spring, J, coiled around the contact-bar abuts at one end against the collar, *j*, secured on the said bar and at the other against the bushing, *k*, of insulating material forming the guide through which the bar, E, passes and insulating it from the guide-piece, F.

It will be seen that the tendency of the spring, J, is to depress the sliding rod. One of the main line circuit wires, E, passes from the relay, *t*, at the principal station and is attached to the binding post, *m*, on the casing, A, and passes from there to the sliding contact-bar, to which it is attached by means of the set-screw, *l*. The other main line wire passes from the relay, *t'*, at the principal station and enters the casing through the binding post, *m'*, and is attached directly or indirectly to the circuit-breaking wheel, B. If the current be traveling in the direction indicated by the dart,—the main line circuit will comprise the main line wire, L, the sliding contact bar, E, the circuit-breaking wheel, B; the return main line wire, L', and the principal station, T.

Fuse wires, N, are placed in the main line wires on either side of the sub-station in order that should an excessive current be passed over the said wires the fuse wires will be melted and break the circuit and thus prevent the principal station from being burned out.

The ground wire, O, from the sub-station is attached at one end to the guide piece, F, and the other is grounded. The electro-magnet, P, is located in said ground line and is adapted to operate the clapper, R, to repeat upon the bell, S, the signal as transmitted from the sub-station to the principal station. Normally the sliding contact rod is in the position shown in the drawing in which the carbon contacts, h, h^2, are not in an engaged position.

The circuit is normally through the main line wires, the ground being out of circuit, and the relay bell, S, does not operate except when the ground is in circuit.

When in transmitting a signal, the main circuit is broken, the ground is automatically thrown in, through the wire, O. If the contact-wheel, B, be turning to transmit a signal and the foot, e', of the contact-bar be in a depressed position between two of the contact-points, b,—upon the foot-piece first contacting with one of the contact-points the ground wire, O, will ground the entire main line circuit and the bell, S, will sound, but the entire current will not flow through the ground because the ground is a poorer conductor than the main-line wires; but if one of the main-line wires be broken, the current will complete its circuit through the ground line, O, the ground, the ground wire, u, at the principal station, and the remaining main-line wire. As the foot piece, e', moves up the incline of the contact-point, b, the carbon-contacts, h, h^2, are separated and the ground through wire, O, is thrown out till the contact-bar, E, again falls to its depressed position. In this manner the grounding of the sub-station forms a safety means, whereby, even if one of the main-line wires be broken, the system will still be in an operative condition. For example if the main-line wire, L', be broken,—when the contact-bar is in a depressed position and the carbon-contact points are engaged, the circuit will comprise the main-line wire, L, the sliding contact rod, E, the cross-arms, e, the support, F, the ground wire, O, the ground and the ground wire, u, at the principal station.

Except when an alarm is being turned in, the ground by wire, O, is not in circuit even when one of the main-line wires is broken, because the carbon contacts which cut the ground in or out, are only in contact when the sliding contact-bar is in a depressed position, and hence the bell, S, will only be sounded when the contact-bar is so depressed.

Having described my invention, I claim—

1. In a signal box, the combination of the main line circuit wire, L', connected to a circuit-breaking wheel; a sliding contact bar adapted to alternately make and break contact with the circuit-breaking wheel, when the latter is turned; the main-line circuit wire, L, attached to the sliding contact bar; a guide piece for the said contact bar and having contact points; insulation between the contact piece and said guide piece; a ground wire in electrical connection with said contact points; and contact points on the sliding contact-bar, normally separated from, but adapted to contact with the said contact-points on the guide piece and thus cut in the ground wire when the main-line circuit is broken by turning the circuit-breaking wheel, and vice versa, as described.

2. In a device of the class described, the combination of the main-line circuit wire, L', connected to the circuit-breaking wheel; a sliding contact-bar adapted to alternately make and break contact with the said circuit-breaking wheel when the said wheel is turned; the main line circuit wire, L, attached to the said contact-bar; a stationary guide-piece for the said sliding contact-bar and having contact points; insulation between the sliding contact-bar and the guide-piece; a ground wire in electrical connection with said contact-points; an electric bell in the line of said ground wire; and contact points on the sliding contact-bar, normally separated from, but adapted to contact with the said contact points on the said guide piece and thus cut in the ground wire, when the main-line circuit is broken by turning the contact-breaking wheel.

3. In a device of the class described, the combination of the main-line circuit wire, L', connected to the circuit-breaking wheel; a sliding contact-bar having cross-arms and adapted to alternately make and break contact with the circuit-breaking wheel when the latter is turned; the main line circuit wire, L, attached to the said sliding contact-bar; contact-points on the cross-arms of the contact-bar; a stationary guide-piece, F, having an insulated bushing, k, through which the contact-bar slides; contact points on the said guide-piece and adapted to alternately make and break contact with the contact-points on the cross-arms of the sliding-bar; and a ground wire in electrical connection with the contact points on the cross-arms, as described.

In testimony whereof I affix my signature in the presence of two witnesses.

MICHAEL J. O'SULLIVAN.

Witnesses:
ABRAM MACAULEY,
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