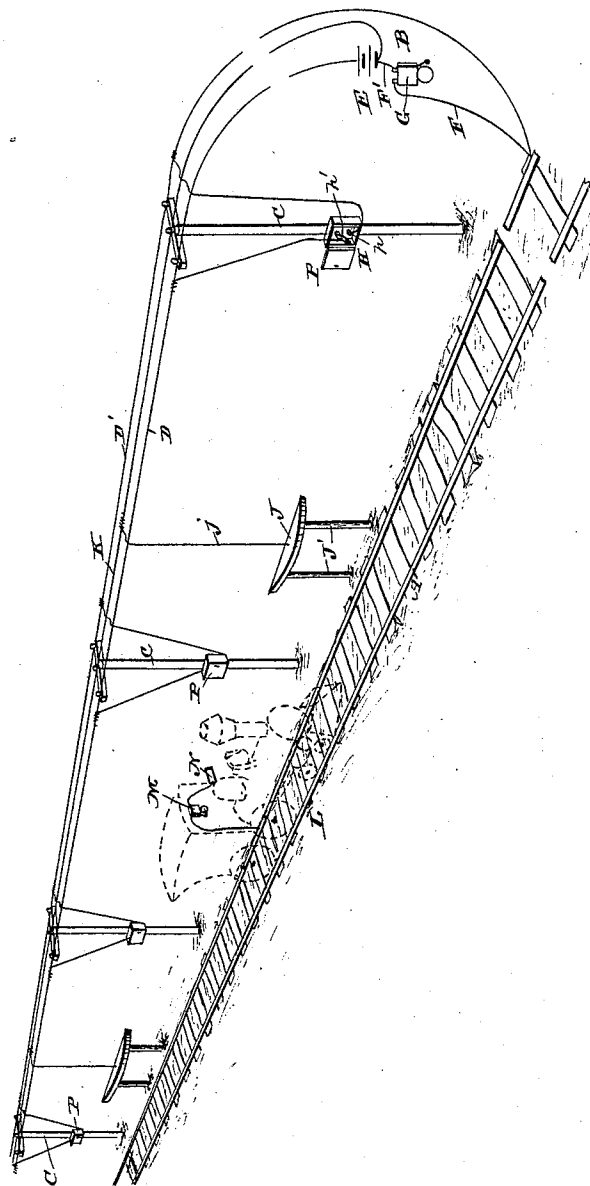


(No Model.)

J. H. McCARTNEY.
SIGNALING APPARATUS.

No. 431,671.

Patented July 8, 1890.



Witnesses

E. B. Smith
A. Kelly

Inventor

James H. McCartney
By *his Attorneys*
Church & Church

UNITED STATES PATENT OFFICE.

JAMES H. MCCARTNEY, OF ROCHESTER, NEW YORK.

SIGNALING APPARATUS.

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To all whom it may concern:

Be it known that I, JAMES H. MCCARTNEY, of the city of Rochester, county of Monroe, and State of New York, have invented certain new and useful Improvements in Signaling Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a part of this specification, and to letters of reference marked thereon.

My present invention relates to signaling apparatus, but particularly to that class of railway-signals designed to give notice when an accident happens to a train or when it is delayed between certain points for any reason whatever; and it has for its object to provide devices capable of many uses, but in the present instance particularly adapted to railways, whereby warning or notice sent to all trains following the one delayed, so that all danger of accidents from such subsequent trains running into the first one is prevented, and also, if desired, notice of the delay is sent to a fixed point or station.

The invention consists in certain constructions and combinations of parts, all as will be hereinafter fully described, and the novel features pointed out particularly in the claims at the end of this specification.

In the drawing I have shown a view of a section of railway-track provided with my invention, showing the circuits and a locomotive.

In carrying out my invention I divide the line of railway into sections, the ends being preferably indicated by the ordinary stations or stopping-places at which persons in the employ of the railway are located, so that notice will be taken of an alarm or signal denoting an accident or delay when sent in, and provide a circuit or circuits extending between the termini of the section and connected with a suitable signal or alarm apparatus, which circuit or circuits may be so manipulated by an authorized person as to cause notice to be given not only at the station, but also to the engineers of any trains that may be, or afterward come, in the section wherein the accident or delay is occasioned.

I have shown a section of track in the drawing provided with one form of apparatus for

carrying my invention into operation, the letter A indicating the line of track, B the station, and C the telegraph or other poles arranged along the track.

D D' represent two wires or conductors extending beside the track from the station, one D being connected with one (say positive) terminal of a battery E at the station and the other, termed a "ground-wire," with the track, as shown. A conductor F extends from the end of the track to one binding-post of an alarm or signaling apparatus G, represented in the present instance by a continuously-ringing bell, the other post being connected by wire F' with the opposite or negative pole of battery E.

Upon suitable supports—say the ordinary telegraph-poles shown and at such distances apart as may be desirable, depending somewhat upon the character of the road, whether straight or with many curves—are arranged suitable simple switches H, composed, preferably, of a contact-pin *h*, connected to one of the conductors D', and a movable member *h'*, connected to the conductor D, constituting a branch circuit adapted to be closed by a switch, said movable members remaining normally off the pins, leaving the circuit formed by the two conductors and bell normally open. The switches are located in boxes or receptacles P sufficiently strong to prevent unwarranted interference and held closed by suitable locking devices capable of being opened only by keys carried by conductors or train-men, or both. In the event of an accident or the unusual delay of a train between the station where the alarm device for the section is located and the next one, the person or persons having the key affording access to the switch-boxes runs to the nearest one and turns the switch, closing the circuit and sounding the alarm at the station, thereby enabling the person there to signal subsequent trains and prevent their coming into the section.

Instead of relying alone upon the signal being sent to a station from which subsequent trains may be signaled by a flagman, I prefer to notify the engineer of a subsequent train directly when a previous train has been delayed for any reason, so that he may either

stop his train or proceed with it under complete control, so as to be able to stop suddenly should it be necessary. In order to accomplish this result, I locate at suitable intervals along the side of the track, which may, as before stated, be determined by the character of the road, a number of contact-plates J, preferably arranged some distance above the ground upon posts J', and connect these plates by conductors *j* with a line-wire K, extending along the line of railway and connected to one—say the negative—terminal of battery E, to which is also connected the ground-wire D', through wire F and alarm G.

In the cab of each locomotive L is arranged an alarm M in the form of an electric bell, one terminal of which is connected to a spring contact arm or brush N, located on the side of the locomotive and arranged to engage the contact-plates J as the train moves by them, while the other terminal is preferably connected to the body of the locomotive. It will now be seen that when a locomotive is in such position that its contact-brush N is in contact with a plate J there are two circuits, one including the battery E, alarm G, and each of the switches H in multiple arc, said circuit being normally open at the switches, and the other circuit from battery E, line K, plate J, arm N, bell M, the track end of ground-wire D', any of the switches H, wire D, back to battery E again, said circuit being normally broken at switches H, and that the closing of any of the switches H will complete both circuits, and not only sound the alarm G at the station, but also the one in the cab of the locomotive.

The operation of the device will now be readily understood. Assuming that an accident happens to a train anywhere in the section, the conductor or person having a key of the switch-boxes proceeds to the nearest one and turns the switch-arm *h* onto contact *h'*. This completes the first-described circuit and sounds the alarm G at the station and connects line D' with one terminal of the battery. As soon as the contact-arm N in any other train in the section comes in contact with a plate J the circuit through its bell M and battery E will be established, sounding the alarm and notifying the engineer that some train in the section his train is in is delayed, thereby warning him to proceed with caution until he is out of the section or comes in sight of the other train or until he passes another plate J, and if his alarm is not sounded he will know that the other train is under way, the conductor or other person having opened the switch H again.

The switch H and contact-plates J on straight roads, when the engineer can see some distance ahead, may be located a considerable distance apart; but on short curves or on a railroad where he can see only a short distance they should be placed comparatively close together, in order that the person relied upon to turn the switch may not have to go

too far in case of an accident, and also so that timely warning may be given the engineers of other trains.

It will be noted that the arrangement of circuits is such that there are practically two series of branch circuits, one including the battery and alarm closed by the switches and the other including the alarms on the trains and the generator and closed by the switches also.

The construction and arrangement of the switch-boxes and plates may be varied, as may be desired, and I have simply shown one form of the apparatus, showing the principles of the invention.

I prefer to employ the ground-wire D', instead of having a return-circuit through the earth, as it would, perhaps, be difficult to secure a good earth-contact at each of the switches, though it will be understood that if desired separate grounds could be formed.

Instead of having the separate contact-plates J along the track, it will be understood that the track or suitable rails or conductors could be provided and contact-arms N remain normally in contact with them; but I prefer the arrangement shown, as it materially cheapens the cost of equipment, and as plates J are some distance above the ground the liability of the signals being short-circuited is materially reduced.

In some instances it may be desirable to dispense with the station-alarm altogether and employ simply the alarms on the locomotive, or to employ signal-boxes in place of the switches H, which would send definite signals to the station, thus indicating the position of the delayed train.

Various modifications may be made of the disposition of the conductors and contacts without departing from the spirit of my invention, and I therefore do not desire to be confined to precisely the arrangements shown.

I claim as my invention—

1. In a signaling apparatus, the combination, with the conductors extending along a way and including an alarm at a station, an electrical generator, and a series of normally-open branch circuits and switches for closing them located at intervals along the way, of a second branch circuit including said switches, and an alarm apparatus carried along the way, whereby upon closing one of said switches both the stationary and traveling alarms will be sounded, as set forth.

2. In a signaling apparatus, the combination, with circuit-conductors extending along a way and including an alarm at a station, an electrical generator, and switches located in branches at intervals along the way, of a second series of branch circuits, each including an alarm apparatus carried along the way, and the switches, substantially as described.

3. In a signaling apparatus, the combination, with circuit-conductors extending along a way, including an alarm and an electrical generator, and a series of switches located in

branches at intervals along the way, of a second series of branch circuits, including the switches and generator, and a vehicle traveling on the way having an alarm thereon adapted to be included in any of the second series of branch circuits, substantially as described.

4. The combination, with a way, circuit-conductors extending along the way, including an alarm and generator, switches located in branches at intervals along the way controlling the circuit, and a second series of branch circuits, including said switches, having contact-plates arranged at intervals beside the way, of a motor traveling on the way having an alarm thereon normally connected with one terminal of the branch circuits, and a contact on the motor arranged to co-oper-

ate with the stationary contacts, substantially as described. 20

5. The combination, with a way, circuit-conductors extending along the way, including a generator, switches located in branches at intervals along the way controlling the circuit, and a second series of branch circuits, including said switches, having contact-plates arranged at intervals beside the way, of a vehicle traveling on the way having an alarm thereon normally connected with one terminal of the branch circuits, and a contact on the vehicle arranged to co-operate with the contact-plates, substantially as described. 25 30

JAMES H. McCARTNEY.

Witnesses:

FRED F. CHURCH,
S. E. TRUE.