H. C. KEYES & J. P. CLARK.

2 Sheets--Sheet 1.

Electric Train Telegraph.

No. 166,616.

Patented Aug. 10, 1875.

Fig. 1.

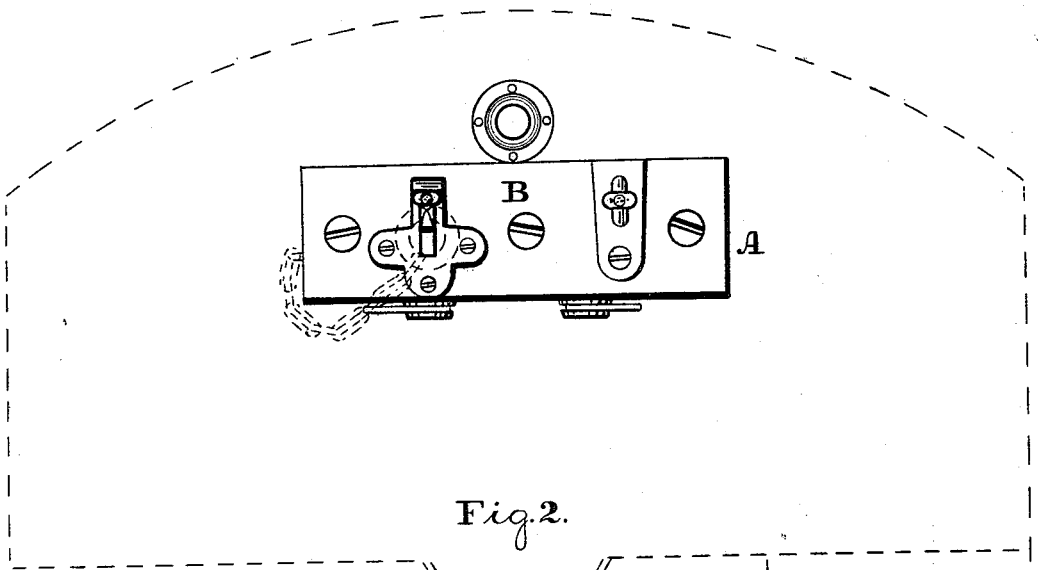


Fig. 2.

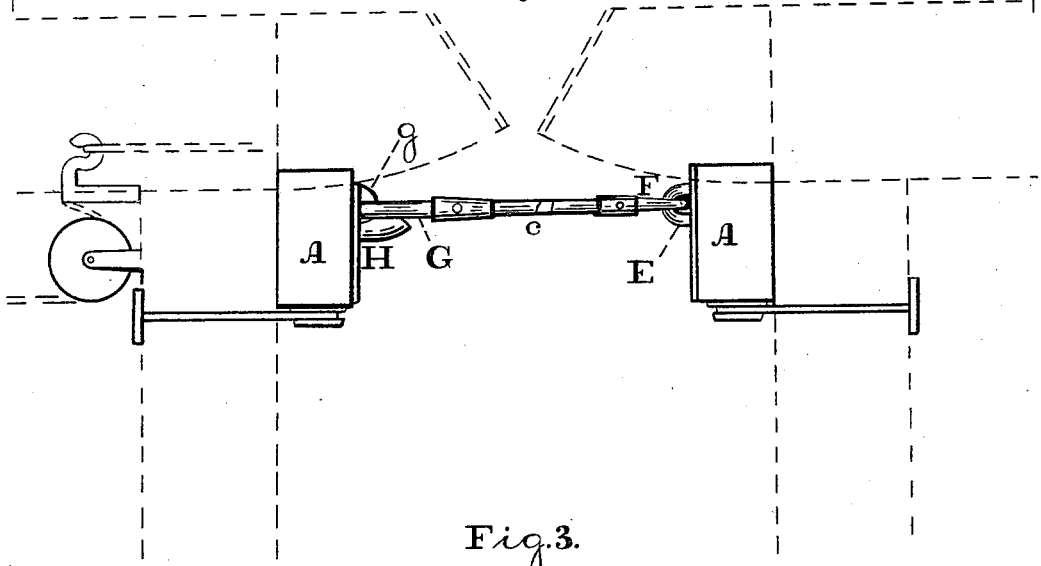
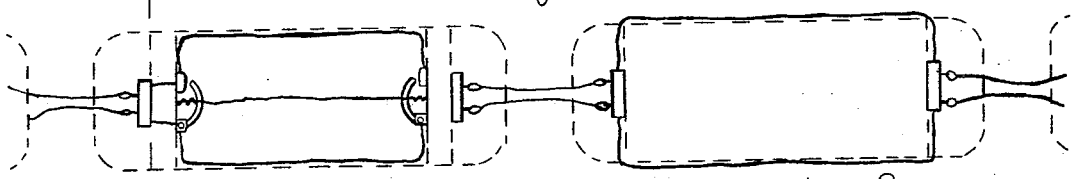


Fig. 3.



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H. C. KEYES & J. P. CLARK. 2 Sheets--Sheet 2.

Electric Train Telegraph

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Fig. 4.

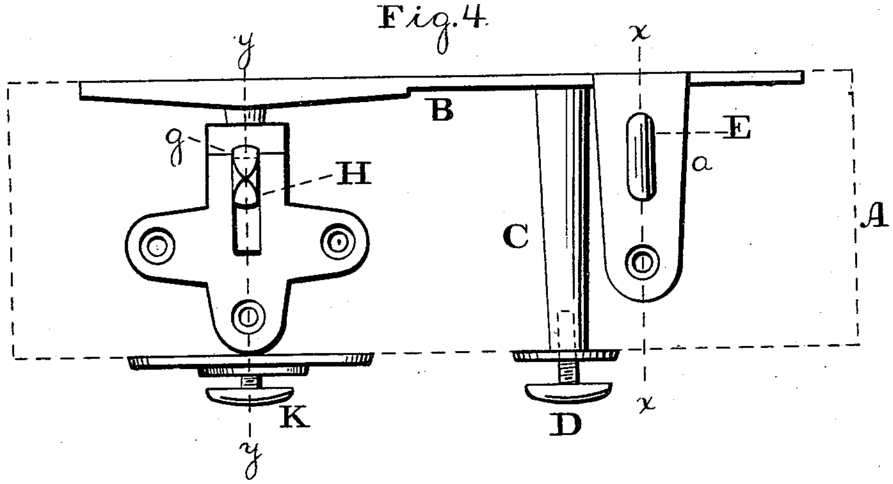


Fig. 5.

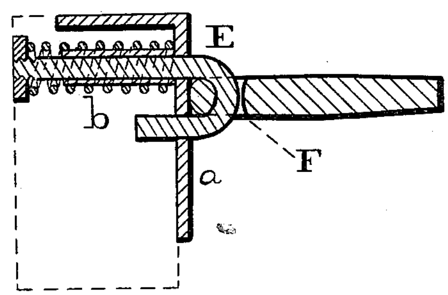


Fig. 7.

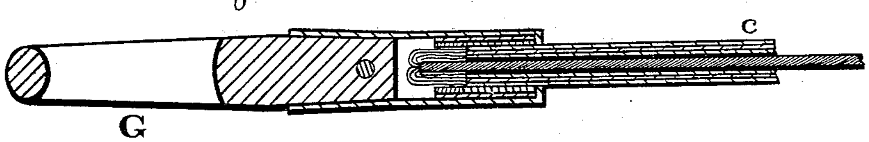
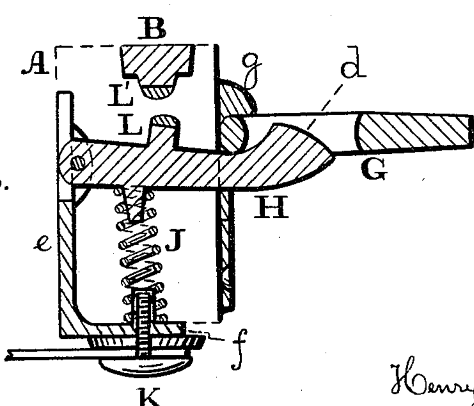


Fig. 6.



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UNITED STATES PATENT OFFICE.

HENRY C. KEYES AND JEDEDIAH P. CLARK, OF PHILADELPHIA, PA.

IMPROVEMENT IN ELECTRIC TRAIN-TELEGRAPHS.

Specification forming part of Letters Patent No. **166,616**, dated August 10, 1875; application filed June 9, 1875.

To all whom it may concern:

Be it known that we, HENRY C. KEYES and JEDEDIAH P. CLARK, both of the city and county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Electric Communicating-Signals for Railway-Trains; and we do hereby declare the following to be a clear and exact description of the nature thereof, sufficient to enable others skilled in the art to which our invention appertains to fully understand, make, and use the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a face view of the device embodying our invention. Fig. 2 is a side view thereof. Fig. 3 is a top view, illustrating the application thereof. Fig. 4 is an enlarged view of Fig. 1, and exhibiting parts not shown in the latter. Fig. 5 is a longitudinal section in line *x x*, Fig. 4. Fig. 6 is a longitudinal section in line *y y*, Fig. 4. Fig. 7 is a longitudinal section of a portion of the insulating cord and attached eye.

Similar letters of reference indicate corresponding parts in the several figures.

Our invention relates to an electric signal apparatus for railway-trains, in place of the bell and cord heretofore in use. It consists in an open metallic circuit, two wires throughout the train, an interrupting bell-magnet, and couplings intermediate of the cars of the train, in connection with push knobs or keys in any part of the train, whereby, by operating said knobs or keys, either directly by hand or by pulling a cord, the circuit will be closed and communication is made between the conductor and engineer. It also consists in couplings so constructed that when two cars are separated, or the train broken or ruptured, the parts of the coupling connected with the two wires in the car will automatically come in contact, thus closing a circuit through the bell-magnet and battery on the locomotive, and causing the continuous ringing of the bell. It also consists in means for insuring a bright metallic connection in the couplings.

Referring to the drawings, A represents a base or block, to which is secured a metallic plate, B, with which is formed or to which is connected a pin or post, C, in which is fitted a binding-screw, D. *a* represents an arm, which is a portion of the plate B, and has formed in it two openings for the passage of the limbs of a U-shaped piece or link, E, to which is connected a coupling link or eye, F. In order to keep the eye F closely in contact with the arm *a*, and thus insure a bright metallic connection between the parts, we employ a spring, *b*, which draws in the link E, and holds the coupling-eye F in contact with the arm *a*. The link E is attached to one end of an insulated cord, *c*, to whose other end is attached an elongated eye, G, which is adapted to be fitted on the head *d* of an arm, H, which is hinged to a plate, *e*, secured to the base A. A spring, J, is interposed between the arm H and lower portion *f* of the plate *e*, to which portion *f* is attached a binding-screw, K. On the side of the arm H, opposite to the spring J, there rises or is formed a platinum point, L, which is adapted to come in contact with a similar point, L′, on the inner or lower face of the metallic plate B, said points being brought together and held in contact by the action of the spring J, and separated when the elongated eye G is fitted on the head *d* of the arm H. In order to prevent accidental displacement of said eye G, a shoulder, *g*, is arranged in proximity to the head of the arm, so that the eye will rest between said head and shoulder, and the latter act as a stop for the eye. On the last car of a train the platinum points will be held separated by a ring or loop fitted in place similarly to the elongated eyes G. (See dotted lines, Fig. 1.)

The insulated cords *c*, to which the link and elongated eye are attached, will be sufficiently long to reach from the end of one car to that of the adjacent car, and to each end of a car will be secured the base A with its various appurtenances, as stated, but the base may be separated, and the two parts connected by a wire. The part of the cord that has arranged with it the eye E will be denominated the fixed end of the cord, and that with the arm H the detachable end thereof.

When a train is made up, the links and eyes of the two insulated cords passing from the blocks of adjacent cords will be disposed as follows: The right side of the base of each car will have the permanent eye E fixed thereto,

and the left side of the base of the adjacent car will have elongated eye G detachably fitted on the head of the arm thereof, so that the permanent eye E and detachable eye G will be on opposite sides. Two wires are run through or around the length of each car, and attached to the binding-screws on the base A, as has been stated. On the fixture of the rear car the ring or eye (shown in dotted lines, Fig. 1) will separate the platinum points L L, there being thus formed a complete open circuit throughout the train. This open circuit, from one base to the other, is through the post C, plate B, arm *a*, link E, and eye F, hence through the insulated cord *c* and elongated eye G, through arm H, spring J, and portion *f* of the plate *e*. Push knobs or keys will be arranged at any part of the train so as at any time to form a metallic connection of the two wires, thereby closing the circuit through the interrupting bell-magnet and battery on the engine, thus causing the ringing of the bell as long as the metallic connection exists, whereby the engineer is signaled.

In the event of the accidental separation of the train, the elongated eye G will be pulled from the head of the arm H, whereby the platinum point of the latter is brought in contact with and remains on the platinum point L′ of the plate B, thereby making a metallic contact through the base and closing the circuit, whereby, by means of the bell-magnet and battery, the continuous ringing of the bell will be occasioned, thus indicating to the engineer the breaking or separation of the train.

The push knobs or keys may be connected to cords extending partially or entirely the length of a car, in order to be conveniently operated.

If it is necessary to add to a train one or more cars that are not provided with the electric signaling apparatus, the ordinary bell-cord may be employed in said cars, and may be attached to a key, as shown in Fig. 2, said key being adapted to close the circuit in the last car fitted with the electric apparatus.

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

1. In an electric signal apparatus for railway-trains consisting of an open metallic circuit, two wires and an interrupting bell-magnet, the plate B, with post C, in combination with the arm *a* and link E, and with the eye F of the insulating cord, substantially as and for the purpose set forth.

2. In an electric signal apparatus for railway-trains consisting of an open metallic circuit, two wires and an interrupting bell-magnet, the hinged arm H and spring J, in combination with the plate *f e*, and with the eye G of the insulating-cord.

3. In an electric signal apparatus for railway-trains having an open metallic circuit, which, when the train is ruptured, will be closed, the hinged arm H, with point L, in combination with the plate B with point L′, substantially as and for the purpose set forth.

4. The eye F of the insulating-cord *c*, in combination with the link E and spring *b*, substantially as and for the purpose set forth.

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