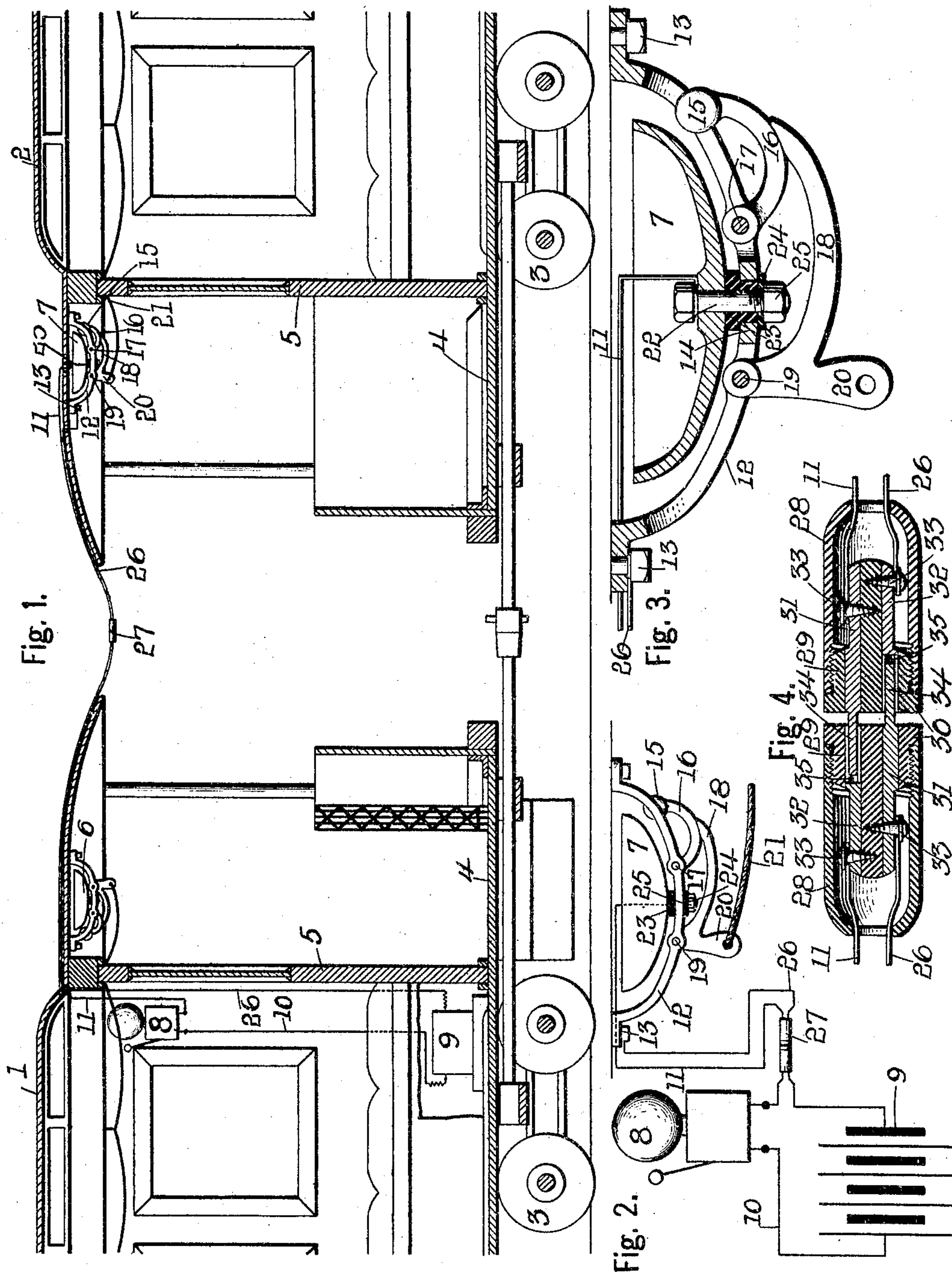


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SIGNALING APPARATUS.
APPLICATION FILED JULY 9, 1904.



Witnesses.

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SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 794,616, dated July 11, 1905.

Application filed July 9, 1904. Serial No. 215,894.

To all whom it may concern:

Be it known that I, GEORGE CAMERON GRAHAM, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Signaling Apparatus, of which the following is a specification.

This invention relates to an improved signaling apparatus whereby a supplementary signaling device, such as an electric bell, is automatically operated by the operation of a main signaling device, such as the ringing of an ordinary gong or bell, through the completion of an electric circuit.

The object of the invention is to provide means for promptly and positively notifying one operator of the action of another operator—for instance, to inform the conductor of a forward or motor electric car of the ringing of the starting, stopping, or other signal on the gong of the trail-car by the trail-car conductor, and thus obviate the liability of starting or stopping the coupled-together cars at the wrong time.

In the adaptation of the invention shown in the accompanying drawings the apparatus is arranged so that the motor-car conductor is instantly and positively informed, no matter in what portion of the car he may be, of the signal given by the conductor of the rear or trail car. This avoids the possibility of accidents or the carrying of passengers beyond their destination through the liability of not hearing or wrongly understanding the sound of the gong in the rear car and which in winter, especially when the car-doors are closed, are of likely occurrence.

For a full and complete understanding of the invention reference is to be had to the accompanying drawings, illustrating an adaptation of the apparatus applied to coupled motor and trail cars of the type used on ordinary electric street-railways, and to the following description and claims.

Figure 1 is a fragmentary section through two cars, such as are ordinarily used upon electric railways, equipped with improved signaling apparatus. Fig. 2 is a diagrammatic view of the improved signaling system. Fig. 3 is an enlarged central section through the

gong of the trailer, showing the method of attaching the terminals of the electric conducting-wires thereto. Fig. 4 is an enlarged detached central section through the device for connecting or coupling the wires of one car to the wires of the other car.

In referring to the drawings for the details of construction of the adaptation of the invention shown like numerals designate like parts.

In Fig. 1 are shown two cars which are coupled to each other, the car designated by the numeral 1 being the power or motor car and the car designated by the numeral 2 being the trailer. These cars are of the usual construction, having wheels 3, platforms 4, sliding doors 5, and signaling bells or gongs 6 and 7, which are secured to the roofs of the platforms in the usual locations.

In the adaptation of the invention shown in the drawings the bell of the trailer-car 2 is connected by wires to an electric bell 8, which is placed inside the motor-car 1, so that when the gong 7 is rung an electric circuit will be completed by the contacting of the clapper with the gong-surface, which will ring the electric bell 8 and positively notify the conductor of the motor-car of the action of the conductor of the trail-car. The bell 8 is preferably operated by an electric battery 9, which may be placed beneath the seat in the car 1 or in any other desirable location and which is connected to the bell 8 by a wire 10. A wire 11 connects the electric bell 8 to the gong 7 of the trail-car, as shown in Figs. 2 and 3. The gong 7 is supported by a curved bracket or bell-frame 12, which is secured to the roof of the platform by bolts 13. This frame or bracket 12 is provided with elongated openings which extend from near the ends of the brackets and terminate near the central connecting portion or web 14, and a clapper 15, having a curved stem 16, is pivoted to the bracket 12 by a pin 17, so as to operate through one of the openings. The clapper 15 is operated by a curved lever 18, which is pivoted by a pin 19 to the bracket 12, (see Fig. 3,) and the lever 18 is provided with an extension 20, to which a pull-rope 21 is secured. The gong 7 is secured to the

bracket 12 by a bolt 22, which passes through openings in the gong and bracket and through openings in a collar 23 and a washer 24 and is secured in place by a nut 25. The collar 5 23 and washer 24 are made of insulating material, and the collar is placed between the gong and bracket, so as to insulate one from the other. A wire 26 connects the battery 9 to the bracket 12, the bracket end of the wire 10 being secured in place by winding the end of the wire around one of the bolts 13.

It will be seen by referring to the drawings that when the rope 21 is pulled to ring the gong 7 an electric circuit is completed the instant the clapper 15 touches the gong 7, the 15 wire 10 conducting the current from the battery to the bell 8, the wire 11 conducting the current from the bell 8 to the gong 7, from whence the current passes through the clapper 15 and lever 16 to the bracket 12, and thence by means of the wire 26 back to the battery, thus completing the circuit and ringing the bell 8 in the forward car.

In order to permit the cars 1 and 2 to be uncoupled, the wires 11 and 26 are each formed of two lengths, which are secured together by a coupling device 27, formed as shown in Figs. 1 and 4. This coupling device is preferably formed, as shown in detail in Fig. 4, 30 in two half portions, and each of said half portions consists of a tubular shell 28, which is reduced at one end and interiorly screw-threaded at the other, and a block or end piece 29, which screws into the screw-threaded end of the shell and has an outer flange 30. 35 Each block 29 is provided with two metal bars 31 and 32, which are embedded in the blocks and secured in place by screws 33. The shells and end pieces are each formed of 40 non-conducting material, such as hard rubber.

The forward end 34 of each bar 31 is reduced and extends beyond the face of the flange 30, while the forward end of each bar 32 is made flush with the surface of the flange and 45 provided with a longitudinally-extending depression or socket 35. The reduced end 34, of each bar 31, fits into the socket 35 of its corresponding bar 32, the ends 34 being rigidly secured by splitting the sockets 35, so that 50 they grip the portions 34 with a spring tension. The wires 11 and 26 are secured to their respective bars 31 and 32 by winding their ends around the screws 33.

I claim as my invention—

55 1. In a signaling apparatus, a motor-car, a trail-car coupled to the motor-car, a main manually-operative signaling device on the trail-car, a supplementary signaling device on the motor-car and means whereby the supplementary signaling device is operated upon the operation of the main signaling device. 60

2. In a signaling apparatus, a motor-car, a trail-car, a main signaling device on the trail-car having two insulated parts which are 65 brought into electrical contact through the

operation of the main signaling device, an electric battery, a supplementary signaling device on the motor-car and conducting-wires connecting the insulated parts of the main signaling device, the electric battery and the 70 supplementary signaling device.

3. In a signaling apparatus, a motor-car, a trail-car, a main manually-operative signaling device on the trail-car, a supplementary electric signaling device on the motor-car, and 75 means whereby the operation of the main signaling device will complete an electric circuit and operate the supplementary electric signaling device.

4. In combination, a gong attached to a trail-car and having at least two insulated parts arranged to be brought into electric connection by the operation of the gong, an electric signal in the motor-car coupled to the trail-car, and conducting-wires connecting to the insulated parts of the gong, the electric signal and 85 to a source of electric supply, substantially as set forth.

5. In combination, a gong attached to a trail-car and having at least two insulated parts arranged to be brought into electric connection by the operation of the gong, an electric signal in the motor-car coupled to the trail-car, conducting-wires connecting to the insulated parts of the gong, the electric signal and to a 95 source of electric supply; said conducting-wires being joined by a separable coupling to permit the car to be easily uncoupled, substantially as set forth.

6. In combination, a plurality of coupled-together cars, a main manually-operative signaling device on one car, a supplementary signaling device on another, and means whereby the supplementary signaling device is operated upon the operation of the main signaling 105 device.

7. In combination, a plurality of coupled-together cars, a manually-operative signaling device in one of said cars, an electrically-operative signaling device in another of said 110 cars; said signals being connected for simultaneous operation.

8. In combination, a motor-car, a trail-car coupled to the motor-car, a gong attached to the trail-car, an electric signal in the motor-car, and conducting-wires connecting to insulated parts of the gong, the electric signal and to a source of electric supply, substantially as set forth. 115

9. In combination, a motor-car, a trail-car, 120 a signaling device in each car, one of which is electric and the other of which is manually operative, wires connecting said signaling devices whereby the electric signal will be operated upon the operation of the other signal. 125

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