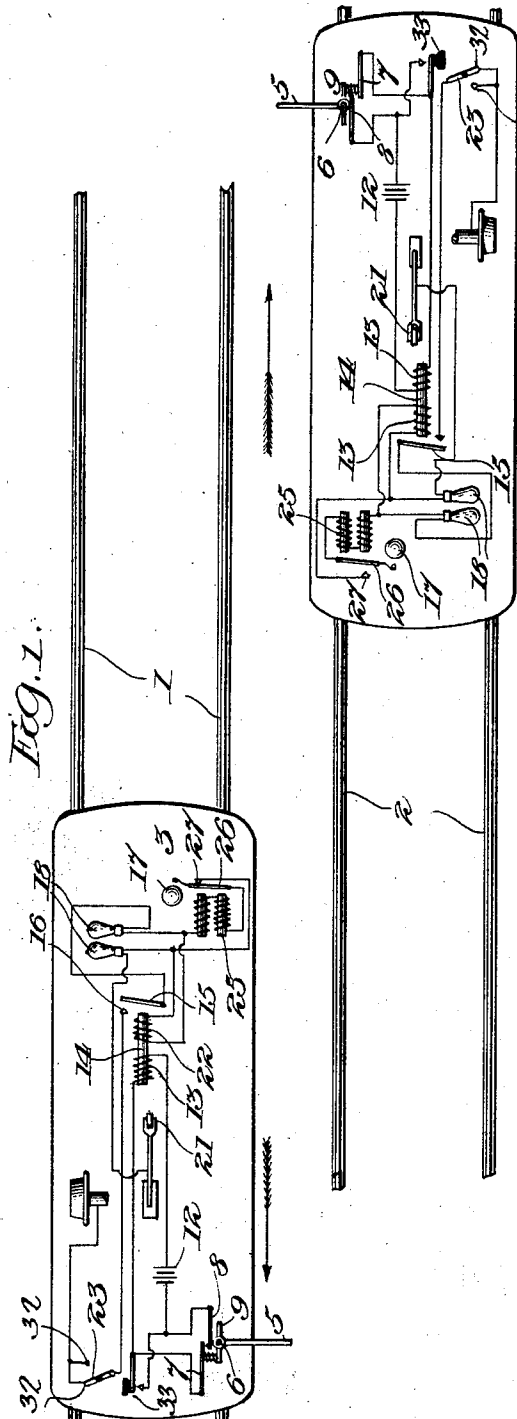


A. O. NICHOLS.
STREET CAR SIGNAL.
APPLICATION FILED APR. 2, 1909.

1,047,110.

Patented Dec. 10, 1912.



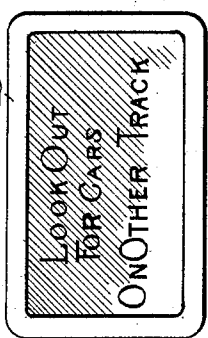
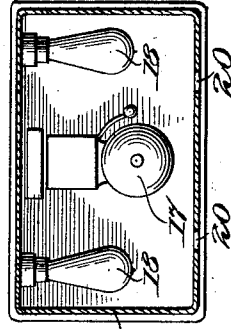
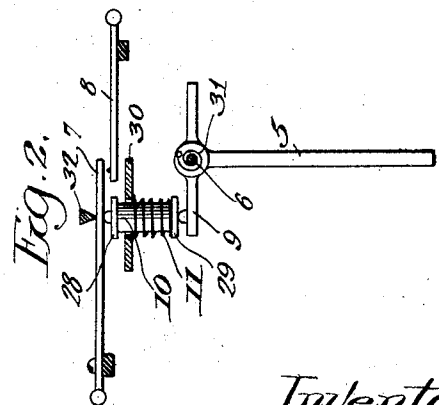
Witnesses
One Herring
Jan Elliott

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

ALFRED O. NICHOLS, OF OMAHA, NEBRASKA.

STREET-CAR SIGNAL.

1,047,110.

Specification of Letters Patent.

Patented Dec. 10, 1912.

Application filed April 2, 1909. Serial No. 487,599.

To all whom it may concern:

Be it known that I, ALFRED O. NICHOLS, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented a certain new and useful Improvement in Street-Car Signals, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to signaling systems for street cars, and is designed to provide practical means for the reduction of the number of accidents which occur when two street cars are passing upon adjoining tracks, one of which cars, in the usual condition, is standing still.

It is well known that when one car is standing at a street car crossing to take on or discharge passengers, if another car is passing in the other direction, any pedestrians that are passing behind the first car, in attempting to cross the street, are in danger of being hidden from the oncoming car on the adjoining track. Various means have been suggested to remedy this defect, but after a number of experiments, I find that a most practical arrangement is the one which is the subject matter of this invention, and which I will now describe in connection with the accompanying drawings illustrating one embodiment thereof, in which—

Figure 1 shows two cars, as having passed upon adjoining tracks; Fig. 2 is a detail view of automatic means which I may employ in one embodiment of my invention; Fig. 3 is a front view of the bell, and Fig. 4 is a rear view thereof.

Like characters of reference indicate like parts throughout the specification.

Primarily, my invention is designed to provide means whereby the motorman can operate a signal on the rear of the car, whenever a car passes in the opposite direction, and at the same time provide automatic means whereby cars passing on adjoining tracks operate this signal on the back of the car, which signal is then restored or stopped from operating by the motorman. I find that it is a great advantage thus to have this signal stopped by the motorman, and not automatically and also provide auxiliary

means whereby the motorman could start the signal, should the automatic operating devices fail.

Generally speaking, therefore, the invention comprises automatic means for starting the signal, which signal will continue operating indefinitely until manually stopped.

In Fig. 1, I have shown two sets of tracks, 1, 1, and 2, 2, and also two cars 3 and 4, which cars are adapted to travel in opposite directions on the tracks, as indicated by the arrows in the drawings. On top of each car is a swinging door 5, more clearly shown in Fig. 2, which swinging door is pivoted on a shaft 6, and is adapted to close circuit through two contact springs 7 and 8, whenever the arm is moved. These two springs are preferably mounted so that when the door 5 swings, its lateral arm 9 releases a small plunger 10, which temporarily allows the springs 7 and 8 to come together. The plunger 10 has a collar 28, and a second collar 29, which are secured to said plunger on its opposite ends, and on opposite sides of a support 30, which said support is rigid with the car framework. A coiled spring 11 presses said plunger against the arm 9. The tendency of the spring 7, due to its elasticity, is to press into engagement with the spring 8, which it can do only when the plunger 10 is out of the way. A coiled spring 31 tends to rotate the door 5 and its arm 9 in a clockwise direction, which movement is limited by the stop 32. It is to be understood that when the door 5 is rotated in a contra-clockwise direction, the tension of the spring 7 permits it to swing against and engage a spring 8. When the circuit is temporarily closed through the springs 7 and 8, battery current from battery 12 flows through one coil 13 of a relay 14, which thereby attracts its armature 15, and closes circuit with a contact 16. A bell mounted in a waterproof casing, with a lamp on either side is used. This bell, as shown in Figs. 3 and 4, comprises a waterproof casing, in which are mounted the bell 17 and the lamps 18, 18. The casing 19 has openings 20, 20 to permit the sound to pass outside said waterproof casing, and the front of said waterproof bell is provided with a transparent shield on which are words indicative of danger to pedestrians who might

be walking onto the adjoining track. When the relay 14 has closed circuit through its armature, a circuit is established from the trolley wheel 21 through the lamp 18, winding 22 of the relay 14, second lamp 18, armature 15 of the relay, contact 16, manual switch 23, to ground through the wheel 24.

It will be seen that a permanent circuit is established including a relay winding 22 and lamps 18, and thus this circuit will remain closed until the motorman moves the switch 23 from one contact post 32 to the other, thereby temporarily opening the circuit, but again restoring it to a position where it can be started again by the automatic arm 5. When the circuit is temporarily opened and shifting from one contact post 32 to the other, the current through the relay winding 22 is broken, and the relay armature falls back into its open circuit position. This same circuit includes in shunt of the relay winding 22, the winding 25, armature 26, and back contact 27 of the bell 17 which will operate as an ordinary vibrating bell across the terminals of the coil 22, receiving only a low share of the entire voltage of this complete circuit from the trolley to ground, so that no injury can come either to the relay winding or to the bell winding. The trolley circuit is only broken by the switch 23, which can be constructed of a suitable 500 volt type. After the signal has thus been started operating by the arm 5, and the danger has passed, the motorman restores the signal to normal by simply moving the switch 23. Should a car be coming from the opposite direction and the automatic devices fail to work, the motorman has another switch 33 of the floor type, which he can temporarily close to start the signal 17 in operation.

It will thus be seen that I provide automatic means for starting the signal, which then continues to operate indefinitely until manually released, and also provide improved means whereby a low voltage portion of the circuit can be used for the relay and bell windings from the high voltage trolley circuit.

While I have herein shown and particularly described the preferred embodiment of my invention, I do not limit myself to the precise construction and arrangement as herein set forth, but—

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

1. A danger signaling system comprising cars passing in opposite directions on parallel tracks, having a signal upon the rear end of each car, a circuit changer for causing said signal to be brought into operation, and means upon a passing car to operatively actuate said circuit changer.

2. A danger signaling system comprising

cars passing in opposite directions on parallel tracks, having a signal upon the rear end of each car, a circuit changer for causing said signal to be brought into operation, electromagnetic devices for maintaining continuously the operation of said signal, means upon a passing car to operatively actuate said circuit changer, and manual switching devices upon the car independently of said circuit changer to render said signal inoperative.

3. A danger signaling system comprising cars passing in opposite directions on parallel tracks, having a signal upon the rear end of each car, a circuit changer for causing said signal to be brought into operation, electromagnetic devices for maintaining continuously the operation of said signal, said devices having an auxiliary coil, means upon a passing car to operatively actuate said circuit changer, and manual switching devices upon the car independently of said circuit changer to render said signal inoperative.

4. A danger signaling system comprising cars passing in opposite directions on parallel tracks, having a signal upon the rear end of each car, a circuit changer for causing said signal to be brought into operation, electromagnetic devices for maintaining continuously the operation of said signal, said devices having an auxiliary coil, means upon a passing car to operatively actuate said circuit changer, and manual switching devices upon the car independently of said circuit changer to render said signal inoperative by opening the circuit through an auxiliary coil.

5. A danger signal system for cars passing in opposite directions upon adjoining tracks, comprising a signal upon the rear end of the car, a signal circuit therefor, a main circuit, a relay having means for establishing said main circuit and to connect the signal circuit in shunt of a portion of said main circuit, a winding on said relay which remains energized so long as the main circuit remains closed, an automatic circuit closer operated by a passing car to energize said relay, and a manual device to break said main circuit.

6. A danger signaling system for cars passing in opposite directions upon adjoining tracks, comprising a signal upon the rear end of the car, a signal circuit therefor, a main circuit, lamps in the signal circuit adjacent to said signal, a relay having means for establishing said main circuit and to connect the signal circuit in shunt of a portion of said main circuit, a winding on said relay which remains energized so long as the main circuit remains closed, an automatic circuit closer operated by a passing car to energize said relay, and a manual device to break the main circuit.

7. A danger signaling system for cars passing in opposite directions upon adjoining tracks, comprising a signal upon the rear end of the car, a signal circuit therefor, a main circuit, lamps in the signal circuit adjacent to said signal, a waterproof cover having words indicative of danger upon the adjoining track for said signal and lamps, a relay having means for establishing said main circuit and to connect the signal circuit in shunt of a portion of said main circuit, a winding on said relay which remains energized so long as the main circuit remains closed, an automatic circuit closer operated by a passing car to energize said relay, and a manual device to break said main circuit.

8. A danger signaling system for cars passing in opposite directions upon adjoining tracks, comprising a signal upon the rear end of the car, a signal circuit therefor, a main circuit, lamps in the signal circuit adjacent to said signal, a waterproof cover having words indicative of danger upon the adjoining track for said signal and lamps, a relay having means for establishing said main circuit and to connect the signal circuit in shunt of a portion of said main circuit, a winding on said relay which remains energized so long as the main circuit remains closed, an automatic circuit closer operated by a passing car to energize said relay, said circuit closer consisting of an oscillating plate, and circuit controlling springs actuated thereby, and a manual device to break said main circuit.

9. A danger signaling system comprising cars passing in opposite directions on parallel tracks, having a signal upon the rear end of each car, a trolley circuit, a circuit changer for connecting said signal in shunt of a portion of said trolley circuit, electromagnetic devices for maintaining continuously the operation of said signal, and means

to disassociate the signal from said trolley circuit.

10. A danger signaling system comprising cars passing in opposite directions on parallel tracks, having a signal upon the rear end of each car, a circuit for said signal, a trolley circuit, a circuit changer to include said signal circuit in bridge of a portion of said trolley circuit to cause its operation, and electromagnetic devices for maintaining continuously the operation of said signal.

11. A danger signaling system comprising cars passing in opposite directions on parallel tracks, having a signal upon the rear end of each car, a circuit for said signal, a trolley circuit, a circuit changer to include said signal circuit in bridge of a portion of said trolley circuit to cause its operation, electromagnetic devices for maintaining continuously the operation of said signal, and means for breaking said trolley circuit.

12. A signal system comprising cars passing each other on adjoining tracks and provided with intercepting movable arms, an alarm mechanism on each car adapted to be operated upon the striking together of said arms, and means to prolong the alarm.

13. A signal system comprising cars passing each other on adjoining tracks and provided with intercepting movable arms, a trolley circuit, an alarm mechanism on each car adapted for connection to the trolley circuit and adapted to be operated upon the striking together of said arms, and means to prolong the alarm.

In witness whereof, I hereunto subscribe my name this 9th day of October, A. D. 1912.

ALFRED O. NICHOLS.

Witnesses:

R. W. TALMAGE,
D. J. ADAMS.