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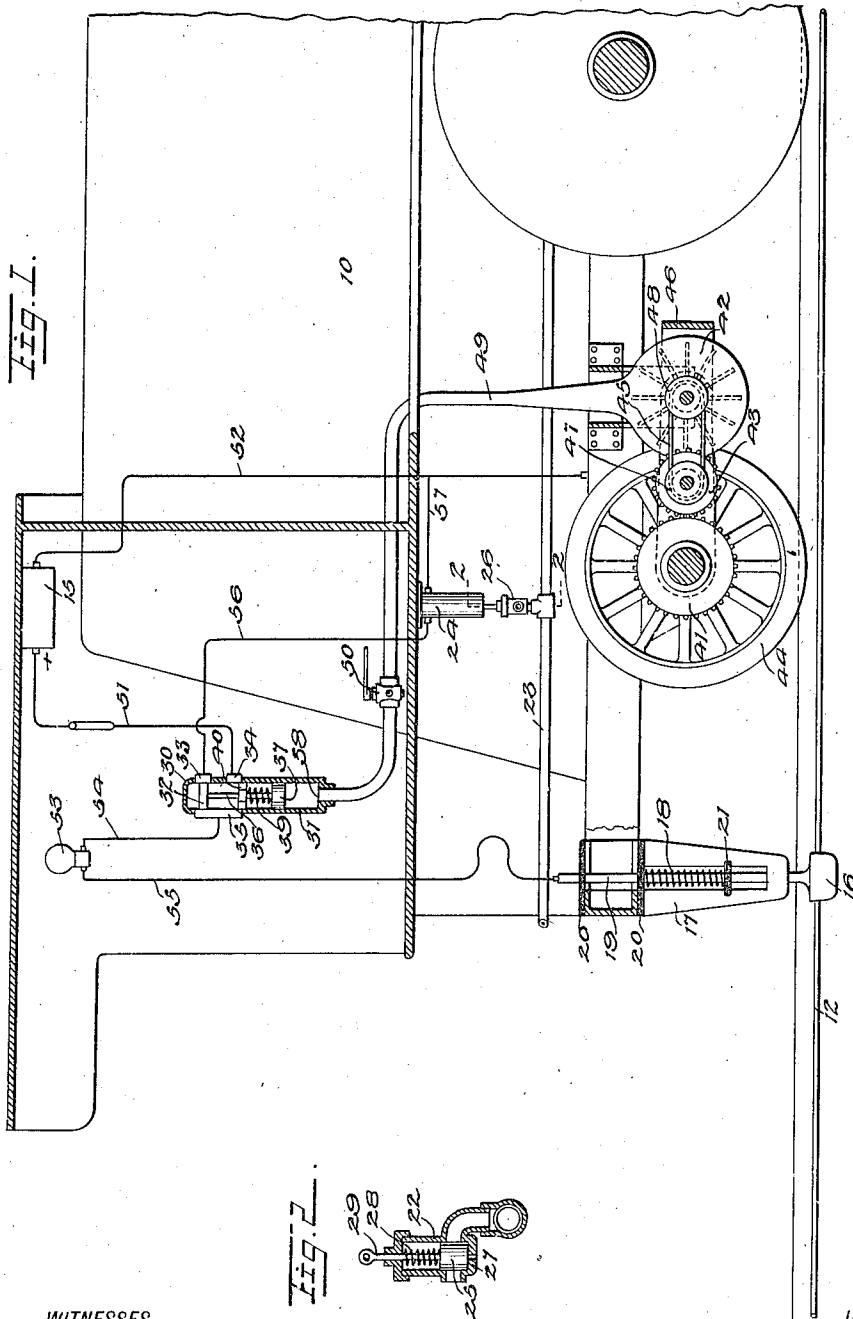
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M. K. HEALY

SAFETY DEVICE FOR RAILWAYS

Filed July 20, 1922

2 Sheets-Sheet 1



WITNESSES

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C. W. Savage

INVENTOR

Michael K. Healy

BY *Munn & Co.*
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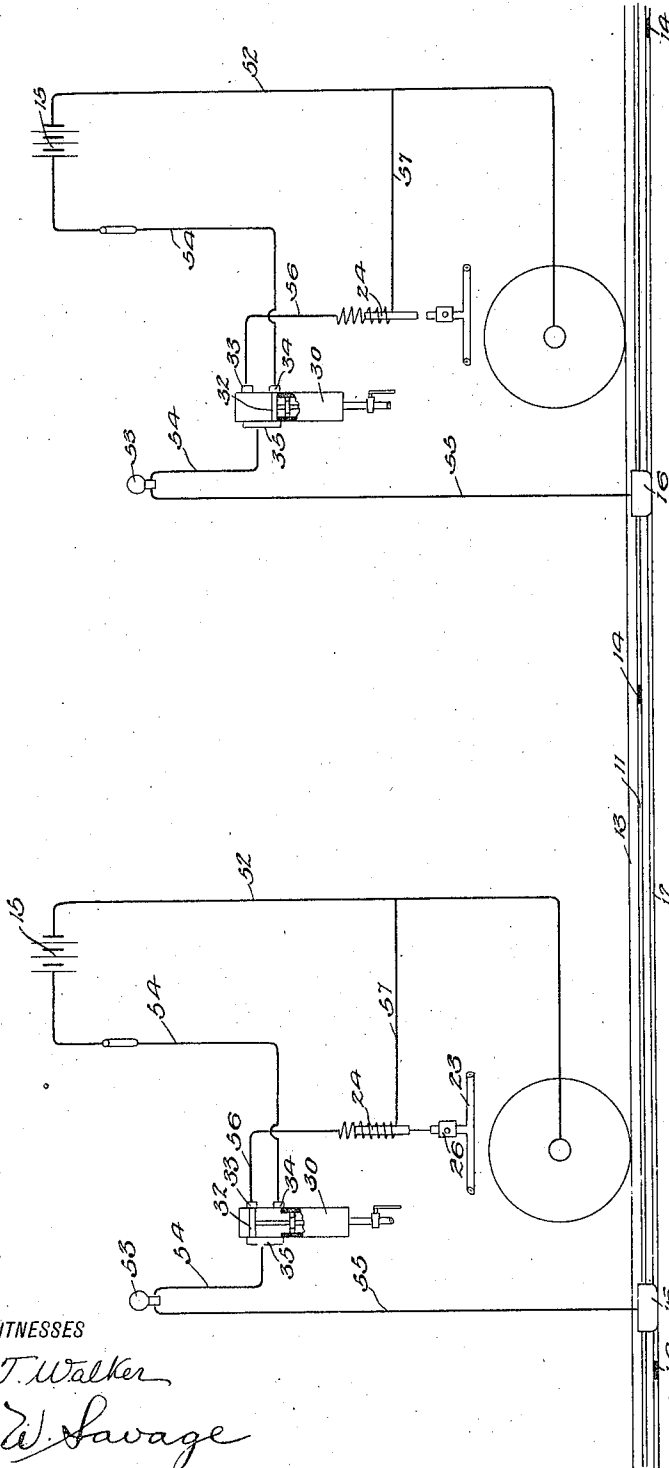
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Fig. 3.



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UNITED STATES PATENT OFFICE.

MICHAEL K. HEALY, OF YONKERS, NEW YORK.

SAFETY DEVICE FOR RAILWAYS.

Application filed July 20, 1922. Serial No. 576,283.

To all whom it may concern:

Be it known that I, MICHAEL K. HEALY, a citizen of the United States, and a resident of Yonkers, in the county of Westchester and State of New York, have invented new and useful Improvements in Safety Devices for Railways, of which the following is a full, clear, and exact description.

This invention relates to automatically operated safety devices for railways.

The general object of this invention is the provision of a simple and efficient automatic safety appliance for use with railways, adapted to prevent trains from running into one another.

This object is accomplished by providing a pair of sectional staggered conductors, and mounting on the rolling stock devices which co-operate with the conductors and are adapted to energize the same when the train is stopped or travelling at a rate below a certain speed, and adapted to be operated to apply the train brakes when it is associated with conductors already energized.

This and other objects of the invention will be more clearly understood from the following detailed description and accompanying drawings.

Figure 1 is a side elevation, partly in section, showing the device mounted on the cab of an engine;

Figure 2 is a section on the line 2—2, Figure 1;

Figure 3 is a diagram showing the connection of the device and how two trains would be associated when contacting with a common conductor.

Referring to the above-mentioned drawings, an engine 10 is shown. Two sectional conductors 11 and 12 parallel a railway track 13. The sections of these conductors may be of different lengths and are insulated from one another as shown at points 14 in Figure 3. Referring to Figure 1, a shoe 16 is provided with a stem 19 which contacts with the conductors 11 and 12 and is slidably mounted in insulating plates 20 carried by a frame 17. An insulating plate 21 is rigidly attached to the stem 19 and slides in the frame 17. Positioned between the lower plate 20 and the plate 21 is a spring 18 which serves to retain the shoe 16 in engagement with the conductors 11 and 12. The frame 17 is carried by the engine 10.

A valve 26 is connected into the train air line 23. This valve assemblage consists

of a casing 22 in which the valve 25 is mounted and normally retained in position in the valve seat 27 by means of a spring 28. A valve stem 29 extends upward through the casing and is connected to the armature of an electromagnet 24. When the electromagnet is energized the armature is operated, drawing the valve stem 29 upward, opening the valve and allowing air to escape from the air line. When the air escapes from the air line the pressure is removed from the brakes which are then applied, stopping the engine.

Mounted on the engine is a switch 30 consisting of a cylindrical casing 31 in which a piston 32 is slidably mounted. Three contact plates 33, 34 and 35 are mounted in the upper end of the cylindrical casing 31. The contact plate 35 is of a length equal to the stroke of the piston 32 so that the piston contacts with it through the whole of the stroke, while the plates 33 and 34 are so positioned that they contact with the piston 32 when it is at the limit of its stroke. Attached to the lower end of a piston rod 36 is a second piston 37 which is in alinement with the opening 38 in the lower end of the cylindrical casing 31. A bracket 40 is positioned in the cylindrical casing 31, and interposed between this bracket and the piston 37 is a spring 39 which normally retains the piston 37 in the lower end of the cylindrical casing 31. A frame 46 is carried by the engine 10. Mounted in this frame is a fan 42. Attached to a gear 43 is a pulley 47 which is connected to the fan pulley 48 by means of a belt 45. The gear 43 meshes with the gear 41 attached to the wheel 44 of the engine 10. Therefore, the fan 42 is driven from the engine wheel 44. An air line 49 extends from the fan 42 to the opening 38 in the cylindrical casing 31. Located in the air line is a valve 50 for restricting the passage of air through the air line 49.

A battery 15 is located in the cab of the engine and the positive terminal of the battery is connected by means of a conductor 51 to the contact plate 34. The other terminal of the battery is connected by a conductor 52 to the frame of the engine 10. The plate 35 is connected through a lamp 53 to the stem 19 of the shoe 16 by means of conductors 54 and 55. Extending between the plate 33 and the electromagnet 24 is a conductor 56. The other terminal

of the electromagnet is connected to the conductor 52 which is grounded by connecting it to the frame of the engine.

The operation of the device is as follows:

5 When the train is not in motion the piston 32 of the switch 30 connects the plate 35 to the plate 34. This connects the battery 15 through the conductor 51, plate 34, piston 32, plate 35, conductor 54, lamp 53, conductor 55 and shoe 16 to the conductors 11 and 12. Thus the conductors 11 and 12 are energized when the train is stationary. When the train is in motion the fan 42 is operated, forcing an air current along the air line 49 into the cylindrical casing 31. 10 This tends to force the pistons 37 and 32 upward but until the train reaches a certain predetermined speed the air current is not strong enough to force the piston 32 to the upper end of its stroke where it contacts with the plates 33 and 35. Until the piston 32 is out of engagement with the plate 34 the battery 15 continues to energize the conductors 11 and 12.

25 When the train is traveling at a sufficient speed to operate the fan 42 at a rate which generates an air current in the air line 49 strong enough to force the piston 32 into engagement with the plate 33, a new circuit is set up. This circuit consists of conductors 11 and 12, shoe 16, conductor 55, lamp 53, conductor 54, plate 35, piston 32, plate 33, conductor 56, electromagnet 24 and the frame of the engine which is considered a 30 ground. If the shoe passes onto conductors which are energized, current flows through this circuit, operating the valve 26 which releases in the pipe line 23, causing the train brakes to be applied.

40 From the above it will be seen that if two trains equipped with devices similar to those described above are traveling on the railway and one of them is compelled through a breakdown to stop or to slow down, the switch 30 connects the battery 15 in series with the shoe 16 thus charging the conductors 11 and 12. If another train approaches this train and is traveling at a high rate of speed, immediately on the shoe 16 of the 50 second train coming into contact with the conductors 11 and 12 which are charged, current flows through the shoe and energizes the electromagnet 24 which applies the brakes, stopping the train and thus preventing any accident.

55 I would state in conclusion that while the illustrated example constitutes a practical embodiment of my invention I do not limit myself strictly to the exact details herein

illustrated since manifestly the same can be considerably varied without departing from the spirit of the invention as defined in the appended claims.

Claims:

1. In a safety device for railways including sectional conductors, means carried by each train for charging the conductors, means carried by the train contacting with the conductors, means for connecting the charging means to the contacting means, and means operated by the trains for directing a current of air against said connecting means to retain it in an inoperative position while the train travels at a rate above a predetermined speed. 65 70 75

2. In a safety device for railways including sectional conductors, a device carried by each train comprising means for charging conductors, means carried by the train contacting with the conductors, means for connecting the charging means to the contacting means, and a fan driven by the train for retaining the connecting means in an inoperative position while the train travels at a rate above a certain speed. 80 85

3. In a safety device for railways including sectional staggered conductors paralleling the railway, a device carried by each train comprising a source of electrical energy, an electromagnet for operating the train brakes, contact means for contacting with the said conductors, a switch, a fan driven by the train for operating the switch to connect the contact means to the electromagnet to energize the same if the conductors are charged and the train is travelling above a certain rate of speed, and means for operating the switch to connect the source of electrical energy to the contact means to charge the conductors when the train is travelling below a certain rate of speed. 90 95 100

4. In a safety device for railways including a pair of sectional staggered conductors paralleling the railway, a device carried by each train comprising a source of electrical energy, means for contacting with said conductors, electromagnets for operating the train brakes, a spring controlled switch normally connecting the source of electrical energy to the contact means for energizing the conductors, and a fan driven by the train for operating the switch, disconnecting the source of electrical energy from the contact means and connecting the electromagnet to the contact means when the train is travelling above a certain speed. 105 110 115

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