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E. H. DEWSON.

AUTOMATIC CUT-OUT FOR ELECTROPNEUMATIC BRAKES.

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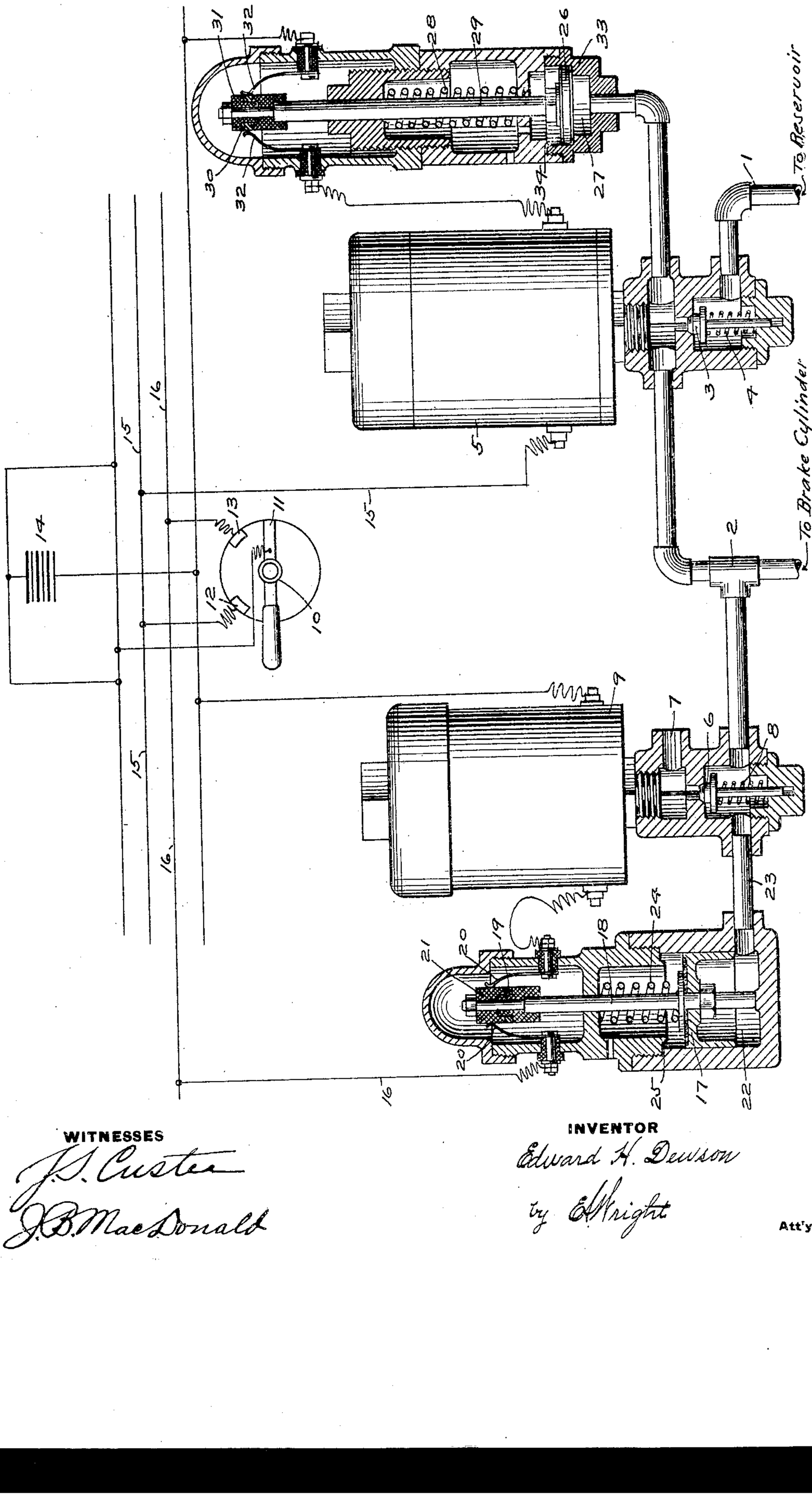

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AUTOMATIC CUT-OUT FOR ELECTROPNEUMATIC BRAKES.

No. 808,022. Specification of Letters Patent. Patented Dec. 19, 1905.

Application filed April 19, 1905. Serial No. 256,469.

To all whom it may concern:

Be it known that I, EDWARD H. DEWSON, a citizen of the United States, residing at Edgewood Park, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Automatic Cut-Outs for Electropneumatic Brakes, of which the following is a specification.

This invention relates to electropneumatic brakes in which electrically-operated valves are employed for controlling the supply of fluid under pressure to and its release from the brake-cylinder. Heretofore in apparatus of this character it has been customary to use admission-valves and release-valves adapted to be normally closed when their magnets are deënergized and to be operated by the magnet when the same is energized by closing the circuit. The controlling-switch is usually provided with contact-points adapted in one position to close the circuit through the application or admission valve magnets and in another position to close the circuit through the release-valve magnets, while in a third or lap position both circuits are interrupted. In releasing the brakes the practice of the motorman is to move the controlling-switch to release position and to leave the same in that position until another application is desired. This maintains the release-magnet circuit closed during the long periods of time that the car is running with the brakes off and causes a large waste of electric current, which continues to flow from the battery or other source of current through the closed release-magnet circuit.

The principal object of my invention is to prevent this waste of electric current; and it consists in the provision of an automatic cut-out for opening the release-magnet circuit when the pressure is depleted or exhausted from the brake-cylinder or at such times as the brakes are not in use.

Another feature of my invention comprises an automatic cut-out for the application-magnet circuit and operated by the brake-cylinder pressure when the same rises to a predetermined point, whereby an excessive brake-cylinder pressure is prevented even if the controlling-switch should be left in application position.

In the accompanying drawing, which illustrates diagrammatically one form of my invention, the pipe 1 leads from a reservoir or other source of fluid under pressure, (preferably air,) while the pipe 2 communicates with the brake-cylinder. (Not shown.) The admission-valve 3, which controls communication from the reservoir or source of supply to the pipe or passage leading to the brake-cylinder, is normally seated by a spring 4 and is adapted to be opened by the application-magnet 5, while the release-valve 6, which controls communication from the brake-cylinder to the atmospheric exhaust-port 7, is normally seated by a spring 8 and is adapted to be opened by the release-magnet 9. A controlling-switch 10 of the usual type may be employed, having a movable bar 11, connected to one pole of battery 14 or other source of electric current, contact-point 12, connected with circuit 16 of the application-magnet 5, and contact-point 13, connected with circuit 15 of the release-valve magnet 9, all of which may be of the ordinary well-known construction.

According to my invention any desired form of automatic cut-out governed by the brake-cylinder pressure may be employed for opening the release-magnet circuit; but, as shown in the drawing, this construction comprises a casing having a piston 17 and rod 18, carrying a contact bar or ring 19 for connecting the fingers 20 of the release-magnet circuit 16 and insulating material 21 for breaking the electric connection in said circuit.

The chamber 22 below the piston is in open communication with the brake-cylinder through a pipe or passage 23, and a light spring 24 is provided for moving the piston and rod to its lower position to open the circuit when the air is exhausted from the brake-cylinder. When compressed air is admitted to the brake-cylinder to apply the brakes, the piston 17 moves up and seats against the shoulder 25, thereby preventing leakage from the brake-cylinder, and at the same time the bar 19 connects the fingers 20 and closes this switch, so that the release-valve-magnet circuit 16 may then be governed by the controlling-switch 10.

According to the second feature of my invention an automatic cut-out switch is provided for opening the circuit of the admission-valve magnet when the brake-cylinder pressure rises to a predetermined point, and while any desired form of switch device may

be used I prefer a design similar to that already described and comprising piston 26, subject on one side to the brake-cylinder pressure in chamber 27, which is opposed by the adjustable spring 28, rod 29, carrying contact-bar 30, and insulating material 31 for engaging the stationary contact-fingers 32 of the circuit 15 of the application-valve magnet 5.

The spring 28 being adjusted to the desired maximum brake-cylinder pressure holds the piston normally seated on the shoulder 33 with the contact-bar 30 engaging the fingers 32. Then as the controlling-switch 10 is turned to application position with contact-bar 11 engaging contact-point 12 the circuit 15 is closed and magnet 5 energized to open admission-valve 3 and supply air to the brake-cylinder in the usual way. The piston 17 then moves to its upper seat and contact-bar 19 engages the fingers 20 of the release-magnet circuit 16; but as this circuit is interrupted at the controlling-switch 10 no current flows to the release-magnet. The brake-cylinder pressure may then be graded up in the usual manner, and if an excessive degree of pressure should be admitted to the brake-cylinder sufficient to overcome the spring 28 the piston 26 will move to its upper seat 34 and interrupt the circuit at contacts 32, thereby deënergizing application-magnet 5 and preventing further admission of air to the brake-cylinder through valve 3. When it is desired to release the brakes, the controlling-switch is set in release position with bar 11 engaging contact 13, thereby completing the circuit 16 and energizing the release-magnet 9 to open valve 6. If the handle of the controlling-switch is left is this position, as is customary, current would with the ordinary structure continue to flow in this circuit; but with my improvement as soon as the pressure is exhausted from the brake-cylinder and chamber 22 the spring 24 acts to return the piston 17 and interrupt the circuit at contacts 20, thereby preventing further flow of current and deterioration of the circuit. The release-magnet circuit then remains open during the time of ordinary running, when no action of the brakes is desired, even if the controlling-switch is normally left in its release position, engaging contact-point 13 of the release-magnet circuit 16, since this circuit is broken at the automatic cut-out switch-points 20. As soon as pressure is admitted to the brake-cylinder for the next application of the brakes the piston 17 moves up and closes the cut-out switch, so that the release-valve may then be controlled by the main governing-switch 10.

It will now be evident that by means of my improvement a continuous flow of current in the release-magnet circuit when the brakes are out of action is prevented, together with the deteriorating effect of such continuous current upon the circuit and magnet-coils.

While I have described my invention as applied to a single equipment, it is obvious that the same may also be employed to a plurality of cars coupled up in a train where the circuits run through the train and the brakes are operated from one of the controlling-switches on any one of the cars.

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

1. In a fluid-pressure brake, the combination with an electrically-operated brake-cylinder release-valve and a circuit for controlling said valve, of means operating automatically to prevent the flow of current in said circuit when the brakes are not in action.

2. In a fluid-pressure brake, the combination with an electric circuit and a brake-cylinder release-valve controlled thereby, of means operated by the depletion of brake-cylinder pressure for interrupting said circuit.

3. In a fluid-pressure brake, the combination with a normally closed valve for controlling the brake-cylinder exhaust, an electromagnet for opening said valve, and a circuit including said magnet, of an automatic cut-out switch for said circuit, and means governed by brake-cylinder pressure for operating said cut-out.

4. In a fluid-pressure brake, the combination with a normally closed valve for controlling the brake-cylinder exhaust, an electromagnet for opening said valve, and a circuit including said magnet, of means operated by the depletion of brake-cylinder pressure for interrupting said circuit.

5. In a fluid-pressure brake, the combination with a normally closed valve for controlling the brake-cylinder exhaust, an electromagnet for opening said valve, and an electric circuit and controlling switch for governing said magnet, of an automatic switch for said circuit, a piston operated by brake-cylinder pressure for closing said automatic switch, and means acting upon depletion of the brake-cylinder pressure to interrupt said circuit.

6. In a fluid-pressure brake, the combination with an electrically-operated brake-cylinder release-valve and a circuit for controlling said valve, of an automatic switch for said circuit, a piston operated by brake-cylinder pressure for closing said switch, and a spring for opening said switch upon depletion of brake-cylinder pressure.

7. In a fluid-pressure brake, the combination with an electrically-operated application-valve for admitting air to the brake-cylinder, and a circuit for controlling said valve, of means operated by the rise in brake-cylinder pressure to a predetermined point for preventing further admission of air to the brake-cylinder.

8. In a fluid-pressure brake, the combination with an electrically-operated application-valve for admitting air to the brake-cylinder,

and a circuit for controlling said valve, of means operated by the rise in brake-cylinder pressure to a predetermined point for interrupting said circuit.

9. In a fluid-pressure brake, the combination of a normally closed valve for controlling the supply of air to the brake-cylinder, an electromagnet for opening said valve, an electric circuit and controlling-switch for said magnet, an automatic cut-out switch in said circuit, and means operated by the rise in brake-cylinder pressure to a predetermined point for operating said cut-out.

10. In a fluid-pressure brake, the combination of a normally closed valve for controlling the supply of air to the brake-cylinder, an electromagnet for opening said valve, an electric circuit and controlling-switch for said magnet, an automatic cut-out switch in said circuit, and a piston subject to the opposing pressures of the brake-cylinder and an adjustable spring for operating said cut-out.

In testimony whereof I have hereunto set my hand.

EDWARD H. DEWSON.

Witnesses:

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