My invention relates to apparatus for the control of railway car retarders, and particularly to apparatus for controlling fluid pressure operated car retarders.

One object of my invention is to provide means for securing several different pressures in the actuating mechanism with a minimum number of line wires between the mechanism and its controller lever.

Another object of my invention is to provide means whereby several retarders may be operated either separately by individual controller levers or simultaneously by a master controller lever.

I will describe one form of apparatus embodying my invention, and will then point out the novel features thereof in claims.

The accompanying drawing is a diagrammatic view showing one form of apparatus embodying my invention.

While my invention may be applied to the control of any desired number of car retarders, for purpose of illustration I have shown it applied to the control of only two car retarders in the drawing, this number being deemed sufficient for a clear understanding of my invention. These two car retarders, which are designated in their entirety by the reference characters A1 and A2, respectively, are similar, and each comprises two braking bars 2 and 3, located on opposite sides of, and extending parallel with, one track rail 1 of a stretch B of railway track, and two similar braking bars 2a and 3a, located on opposite sides of, and extending parallel with, the other track rail 1a of the stretch B.

In accordance with my invention means are provided for controlling the two car retarders A1 and A2 either separately by individual controller levers L1 or L2, or jointly by a master controller lever L. The means for controlling each retarder by its individual lever are similar, and it is believed, therefore, that a clear understanding of both means may be had from a description of only one.

Referring particularly to the means for separately controlling the retarded A1, this means includes a fluid pressure motor M comprising a cylinder 4 containing a reciprocable piston 5 which is attached to a piston rod 5a. The braking bars 2, 3, 2a and 3a are operatively connected with the piston rod 5a of motor M through a suitable linkage including a lever 6 pivoted at 6a. When piston 5 of motor M moves its left-hand position, braking bars 3 and 3a of car retarder A1 are moved toward the right, and braking bars 2 and 2a are moved toward the left, and the braking bars then occupy their ineffective or non-braking positions, as shown in the drawing. When piston 5 is moved to its right-hand position, however, the braking bars are each moved toward the associated rail to their effective or braking positions in which they engage the sides of the wheels of a railway vehicle traversing rails 1 and 1a.

Motor M1 is controlled by three magnet valves D1, E1 and F1. These valves are similar and each comprises a valve stem 7, biased to an upper position by a spring 8 and provided with an armature 9 and a winding 10. When valve D1 is energized, valve stem 7 of this valve moves downwardly against the bias exerted by spring 8, and a pipe 11 which communicates with the left-hand or application end of motor M1 is then connected with a pipe 12 which is constantly supplied with fluid pressure, usually air, from a suitable source not shown in the drawing. When valve D1 is deenergized, however, valve stem 7 of this valve is moved upwardly by spring 8, and pipe 11 is then disconnected from pipe 12. When valve E1 is energized, valve stem 25 of this valve moves downwardly, and pipe 11 is then connected with atmosphere through a pipe 13 and a port 14, but when valve E1 is de-energized, pipe 11 is disconnected from atmosphere and a pipe 16 which communicates with the pipe 13 through a pipe 15, is vented to atmosphere through port 14. When valve F1 is energized, valve stem 7 of this valve moves downwardly and connects pipe 15 with pipe 12, but when valve F1 is deenergized, pipe 15 is disconnected from pipe 12. It will be apparent, therefore, that when valve D1 is energized, the application end of motor M1 is supplied with fluid pressure, and when valve F1 is energized, the restoring end of motor M1 is supplied with fluid pressure. Furthermore, when valve E1 is energized, the application end of motor M1 is vented to atmosphere, and when valve E1 is deenergized, the restoring end of motor M1 is vented to atmosphere.

Valves D1, E1 and F1 are controlled in part by a plurality of similar pressure responsive devices each designated by the reference character K with a distinguishing exponent and subscript.

Referring to the pressure responsive device K10, for example, this device comprises a Bourdon tube 16, connected by means of a pipe 17 with the application end of motor M1, and hence subjected to the pressure in the application end of motor M1. The Bourdon tubes 16 55.
each control two contacts 18-18a and 18-18b, and are arranged to operate in succession as the pressure in the application end of motor M1 increases. For example, for a pressure below ten pounds per square inch, all contacts 18-18b of both of these devices are closed. If the pressure exceeds ten pounds per square inch, however, contact 18-18a of device K10-30 opens, and if the pressure exceeds twenty pounds per square inch, contact 18-18b of device K10-30 closes. In a similar manner, the pressure responsive device K20-30 is adjusted to open its contact 18-18b at forty pounds per square inch, and to close its contact 18-18a at fifty pounds per square inch.

Of course, these specific pressures are not essential but are only mentioned for purposes of explanation.

The valves E1 and F1 are also controlled in part by a contact G which, in turn, is controlled in accordance with the position of piston 5 of motor M1. In such manner that this contact will be closed at all times except when the piston is moved to its extreme left-hand position in which the braking bars occupy their ineffective or non-blocking positions, as shown in the drawing.

The valves D1, E1 and E2 are further controlled by the lever L1 which, as here shown, is capable of assuming five positions indicated by dotted lines in the drawing. The first position is designated R1, and is the position in which the lever is placed when it is desired to release the braking bars of the car retarder A1 to their ineffective or non-blocking positions. The second position of the lever L1 is designated R2, and is the normal position, that is, the position in which the lever L1 is placed when no control of the retarder by the lever L is desired. The third and fourth positions of the lever L1 are designated P0-30 and P0-30 respectively, meaning that when the lever is in position P0-30 a pressure of between ten and twenty pounds per square inch will be maintained in the left-hand, or application end, of motor M1, and when the lever is in the position P0-30 a pressure of between forty and fifty pounds per square inch will be maintained in the application end of motor M1. The last position of the lever L1 is designated P0-30 when the lever is in this position the full available pressure will be admitted to the left-hand end of the motor, it being assumed that the full available pressure is fifty pounds per square inch.

Lever L1 controls a plurality of contacts 20 to 32, inclusive, adjacent each of which is placed a letter or letters which correspond to the lever position or positions for which the corresponding contact is closed. For example, contact 20 is closed only when lever L1 occupies its N position. Similarly, contact 21 is closed in the P10-30 position of the lever, the P0-30 position of the lever, or any position intermediate these two positions.

Lever L1 will usually be located at a point remote from the braking apparatus, as in the control cabin of a classification yard car retarder system, and will be connected with the braking apparatus by means of line wires extending from the control cabin to the braking apparatus.

As shown in the drawing, lever L1 occupies its normal position, and all circuits leading to the retarder actuating apparatus are therefore open.

The valves D1, E1 and F1 are therefore all de-energized, so that the supply of fluid pressure to both ends of cylinder 4 of motor M1 is cut off, and the right-hand end of cylinder 4 is vented to atmosphere. The contacts 18-18b of the pressure responsive devices K10-30 and K20-30 are both open, and the contacts 18-18a are both closed. Piston 5 of motor M1 occupies its extreme left-hand position, and the braking bars of the car retarder A1 therefore occupy their ineffective or non-blocking positions. Since piston 5 of motor M1 occupies its extreme left-hand position, contact G1 is open.

In explaining the operation of the apparatus thus far described as a whole, I will first assume that the operator desires to apply a pressure of 10 between ten and twenty pounds per square inch to the application end of motor M1 to cause the braking bars of the car retarder A1 to exert a corresponding pressure on the wheels of a passing car. To do this, he moves lever L1 to position 35 P0-30, whereupon a circuit for the application valve D1 becomes closed, which circuit passes from a suitable source of current, here shown as a battery H, through wire 34, contact 24 of lever L1, wires 35, 36 and 37, contact 28 of lever L1, line wire 38, contact 18-18a of pressure responsive device K10-30, wire 38, winding 10 of valve D1, line wire 41, wire 42, contact 21 of lever L1, and wires 43 and 44 back to battery H. The application valve D1 therefore becomes energized and admits fluid pressure to the application end of motor M1 until the pressure reaches ten pounds per square inch, at which time contact 18-18a of pressure responsive device K10-30 opens and interrupts the circuit just traced for valve D1, so that this valve again becomes de-energized. The applied pressure is, however, retained in the application end of motor M1. If the pressure of the application end of motor M1 exceeds twenty pounds per square inch for any reason, contact 35 18-18b of pressure responsive device K20-30 becomes closed and will complete a circuit for the exhaust valve E1 which passes from battery H through wire 34, contact 24 of lever L1, wires 35, 36 and 37, contact 28 of lever L1, line wire 38, contact 18-18b of pressure responsive device K20-30, wire 45, winding 10 of valve E1, wires 46 and 47, contact G1, wire 48, line wire 41, wire 42, contact 21 of lever L1, and wires 43 and 44 back to battery H.

The current flowing in this circuit will energize the exhaust valve E1, and this valve will therefore operate to exhaust fluid from the application end of the motor M1 until the pressure again decreases to twenty pounds per square inch, whereupon contact 18-18b will open and 50 winding 10 of the exhaust valve E1 will again become de-energized.

If, now, the operator desires to increase the pressure in the application end of motor M1 to between forty and fifty pounds per square inch to increase the braking effect of the car retarder A1, he moves lever L1 to its P0-30 position. The application valve D1 then becomes energized by virtue of a circuit which passes from battery H through wire 34, contact 24 of lever L1, wires 35, 36, 37 and 49, contact 28 of lever L1, line wire 38, wire 50, wire 51, an asymmetric unit J1 in its low resistance direction, wire 53, contact 18-18a of pressure responsive device K10-30, wires 54 and 39, winding 10 of application valve D1, line wire 65, wire 41, wire 42, contact 21 of lever L1, and wires 43 and 44 back to battery H. The application valve D1 remains energized under these conditions until the pressure in the application end of motor M1 reaches forty pounds per square inch, whereupon the circuit just traced for this valve is opened at contact 18-18a of pressure responsive device K10-30. If the pressure in the application end of motor M1 exceeds fifty pounds per square inch for any reason, exhaust valve E1 would be de-energized.
will become energized, and will exhaust fluid from the motor until the pressure again decreases to fifty pounds per square inch, the circuit for the exhaust valve under these conditions being from battery H through wire 34, contact 24 of lever L^4, wires 35, 36, 37 and 43, contact 29 of lever L^2, wires 27, 28, 29, and 30, in the unit K^4, in its low resistance direction, wire 53, contact 18-18^6 of pressure responsive device K^40-30, wires 55 and 45, winding 10 of exhaust valve E^4, wires 46 and 47, contact G^1, wire 48, line wire 41, wire 47, contact 21 of lever L, and wires 43 and 44 back to battery H.

If the operator desires to admit the full available pressure to the application end of motor M^2, he moves lever L^2 to position P^30. A circuit for the application valve D^1 is then closed which may be traced from battery H through wires 34 and 55, contact 25 of lever L^1, wires 58 and 42, line wire 41, winding 10 of valve D^1, wires 59, 54 and 58, an asymmetric unit K^4 in its low resistance direction, wire 51, line wire 50, contact 29 of lever L^2, wires 49, 37, 36 and 35, contact 23 of lever L^1, and wire 56 back to battery H. This circuit does not include any of the pressure responsive devices K^4, and consequently, the full available operating pressure will be admitted to the application end of motor M^2 under these conditions.

It should be pointed out that if the operator moves the lever L^1 from a position corresponding to a higher pressure to a position corresponding to lower pressure, the apparatus will immediately and automatically reduce the pressure in the application end of motor M^2 to a value corresponding to the new position of the lever in a manner which will be apparent from the drawing without tracing the sequence of operation in detail.

In order to restore the braking bars of the car retarder A^1 to their ineffective or non-braking positions, the operator places lever L^1 in its R or restore position. When the lever occupies this position, circuits are completed for both the exhaust valve E^4 and the restoring valve F^4, so that both of these valves now become energized. The circuit for the exhaust valve E^4 passes from battery H through wires 34 and 56, contact 25 of lever L^1, wire 56, contact 27 of lever L^1, line wire 61, winding 10 of valve E^4, wires 48 and 47, contact G^1, wire 48, line wire 41, wires 64 and 65, contact 22 of lever L^1, and wire 44 back to battery H. The circuit for valve F^4 passes from battery H through wires 34 and 66, contact 25 of lever L^1, wire 56, contact 27 of lever L^1, line wire 52, wire 66, winding 16 of valve F^4, wire 47, contact G^1, wire 48, line wire 41, wire 46 and 65, contact 22 of lever L^1, and wire 44 back to battery H. The energization of the exhaust valve E^4 vents to atmosphere the fluid pressure which was previously supplied to the application end of motor M^2, while the energization of the restoring valve F^4 admits fluid pressure to the restoring end of the motor. Piston S of motor M^2 therefore moves to its extreme left-hand position to restore the braking bars to their ineffective or non-braking positions, as does the extreme right-hand position, contact G^1 opens and interrupts the circuits which were previously closed for valves E^4 and F^4, thus deenergizing these valves. Lever L^2 may then be restored to its normal or N position, and when this is done, all the valves will be in the positions in which they are shown in the drawing.

As previously pointed out, the construction and operation of the apparatus including the lever L^2 for separately controlling the car retarder A^1, is similar in all respects to the apparatus including the lever L^2 for controlling the car retarder A^2, and it is believed, therefore, that it will be readily understood from the foregoing, and from an inspection of the drawing, without describing it in detail.

Before entering into a detailed description of the control of the retarders A^1 and A^2 by the master lever L^M, it should be pointed out that this lever is similar to the levers L^2 and L^3 with the exception that the lever L^M is not provided with any contacts which are closed when the lever occupies its N position. It should also be pointed out that in order to effect the joint control of the car retarders by the master lever, it is necessary that the individual levers occupy their normal positions in which the associated contacts 20, 30, 31 and 32 are closed.

Assuming now that the levers L^2 and L^3 both occupy their normal positions, as shown in the drawing, and that the operator wishes to cause a pressure of between ten and twenty pounds per square inch to be simultaneously supplied to the application ends of both motors M^2 and M^3, he moves lever L^M to its P^30 position. A circuit for the application valve D^1 will then be closed which passes from battery H through wires 81 and 82, contact 24 of lever L^M, wires 65, 67 and 68, contact 28 of lever L^M, wires 65 and 70, contact 31 of lever L^1, wire 72, line wire 83, contact 18-18^6 of pressure responsive device K^10-30, wire 39, winding 10 of valve D^1, line wire 41, wire 66, contact 20 of lever L^2, wires 73 and 74, contact 21 of lever L^2, and wires 79 and 80 back to battery H. At the same time, a circuit for the application valve D^2 will also be closed, this latter circuit passing from battery H through wires 81 and 82, contact 24 of lever L^M, wires 65, 67 and 68, contact 28 of lever L^M, wires 65 and 70, contact 31 of lever L^2, line wire 15, contact 18-18^6 of pressure responsive device K^10-30, wire 34, winding 10 of valve D^2, line wire 91, wires 71 and 73, contact 20 of lever L^2, wire 74, contact 21 of lever L^2, and wires 79 and 80 back to battery H. The valve D^1 and D^2 will therefore now both become energized, so that the braking bars of both retarders A^1 and A^2 will be simultaneously moved to their braking positions. When the pressure in the application end of motor M^2 reaches ten pounds per square inch, contact 18-18^6 of pressure responsive device K^10-30 will open and will deenergize valve D^1, and if the pressure exceeds twenty pounds per square inch, exhaust valve E^5 will then become energized, the circuit for the valve E^5 under these conditions passing from battery H through wires 81 and 82, contact 24 of lever L^M, wires 65, 67 and 68, contact 25 of lever L^2, wires 68 and 70, contact 31 of lever L^1, wire 72, line wire 83, contact 18-18^6 of pressure responsive device K^10-30, wire 45, winding 10 of valve E^5, wires 46 and 47, contact G^1, wire 48, line wire 41, wire 64, contact 20 of lever L^2, wires 73 and 74, contact 21 of lever L^2, and wires 79 and 80 back to battery H. Similarly, when the pressure in the application end of motor M^3 reaches ten pounds per square inch, contact 18-18^6 of pressure responsive device K^10-30 will open and will deenergize valve D^2, and if the pressure exceeds twenty pounds per square inch, contact 18-18^6 of pressure responsive device K^10-30 will become closed and will complete a circuit for the exhaust valve E^3 which passes from battery H through wires 81 and 82, contact 24 of lever L^2.
LM, wires 66, 67 and 68, contact 28 of lever LLM, wire 69, contact 31 of lever LLM, line wire 75, contact 18—19 of pressure responsive device KE36—40, wire 83, winding 10 of valve E6, wires 84 and 85, contact G6, wire 86, line wire 91, wires 79 and 78, contact 26 of lever L2, line wire 76, contact 21 of lever L2, and wires 78 and 85 back to battery H. 

If, when the levers L1 and L2 are still in their normal positions, lever LLM is moved to its F20—50 positions to increase the pressure in the application of the motor of the valve LM and D2 both will become energized and will remain energized until the pressure in the application end of the associated motor reaches forty pounds per square inch. The circuit for valve D1 under these conditions passes from battery H through wires 81 and 82, contact 24 of lever L1, wires 66, 67 and 68, contact 29 of lever L1, wires 87 and 88, contact 32 of lever L1, wire 89, line 20 wire 60, wire 61, asymmetric unit J1 in its low resistance direction, wire 63, contact 18—18 of pressure responsive device KE36—40, wires 54 and 56, winding 10 of valve D1, line wire 41, wire 64, contact 26 of lever L2, wires 73 and 74, contact 21 of lever L2, and wires 78 and 85 back to battery H. 

The circuit for valve D2 under these conditions passes from battery H through wires 81 and 82, contact 24 of lever L1, wires 66, 67 and 68, contact 29 of lever L1, wire 90, wire 105, asymmetric unit J2 in its low resistance direction, contact 18—18 of pressure responsive device KE36—40, wires 52 and 56, winding 10 of valve D3, line wire 91, wires 77 and 78, contact 26 of lever L2, wire 74, contact 21 of lever L2, and wires 78 and 85 back to battery H. If the pressure in the application end of motor M1 now exceeds fifty pounds per square inch for any reason, the exhaust valve E1 will become energized, the circuit for this valve being from battery H through wires 81 and 82, contact 24 of lever L1, wires 66, 67 and 68, contact 29 of lever L1, wires 87 and 88, and contact 32 of lever L1, wire 89, line wire 55, wire 51, asymmetric unit J1 in its low resistance direction, wire 53, contact 18—18 of pressure responsive device KE36—40, wires 54 and 56, winding 10 of valve E1, wires 46 and 47, contact G1, wire 48, line wire 41, wire 64, contact 26 of lever L1, wires 73 and 74, contact 21 of lever L1, and wires 78 and 85 back to battery H. In similar manner, if the pressure in the application end of motor M2 now exceeds fifty pounds per square inch, the exhaust valve E2 will become energized over a circuit which passes from battery H through wires 81 and 82, contact 24 of lever L2, wires 66, 67 and 68, contact 29 of lever L2, wire 87, contact 32 of lever L2, line wire 90, wire 105, asymmetric unit J2 in its low resistance direction, contact 18—18 of pressure responsive device KE36—40, wire 83, winding 10 of valve E6, wires 84 and 85, contact G6, wire 86, line wire 91, wires 77 and 78, contact 20 of lever L2, wire 74, contact 21 of lever L2, and wires 79 and 85 back to battery H. 

If, with the levers L1 and L2 still in their normal positions, lever LLM is moved to its G50 position, full line pressure will be admitted to the application end of both motors M1 and M2, the valve D1 being energized under these conditions through wires 81 and 82, contact 24 of lever L2, line wire 91, wires 77 and 78, contact 20 of lever L2, line wire 74, contact 21 of lever L2, and wires 79 and 85 back to battery H. 

Through wires 81, 82, 83 and 84, contact 26 of lever L2, wires 85, 74 and 13, contact 20 of lever L1, wire 64, line wire 41, winding 10 of the valve D1, wires 39, 54 and 59, asymmetric unit K2 in its low resistance direction, wire 61, line wire 56, wire 89, contact 32 of lever L1, wires 88 and 87, contact 29 of lever L1, wires 68, 67 and 66, contact 23 of lever L1, and wires 79 and 80 to battery H; and the valve D2 being energized over a circuit which passes from battery H through wires 81, 82, 83 and 94, contact 26 of lever L1, wires 95 and 14, contact 20 of lever L2, wires 78 and 77, line wire 91, winding 10 of valve D2, wires 76 and 72, asymmetric unit K2 in its low resistance direction, line wire 90, contact 18 of lever L2, wires 88 and 89, contact 10 of lever L1, wire 101, line wire 62, asymmetric unit O1 in its low resistance direction, wire 45, 55 winding 10 of valve E6, wires 46 and 47, contact G6, wire 48, line wire 41, wire 64, contact 20 of lever L1, wires 73, 74 and 105, contact 29 of lever L1, wire 87, line wire 18 and 80 back to battery H. 

The circuit for valve F1 passes from battery H through wires 81, 82 and 83, contact 25 of lever L1, wire 67, contact 27 of lever L1, wires 89 and 100, contact 10 of lever L1, wire 101, line wire 62, asymmetric unit O1 in its low resistance direction, wire 45, 55 winding 10 of valve E6, wires 46 and 47, contact G6, wire 48, line wire 41, wire 64, contact 20 of lever L1, wires 73, 74 and 105, contact 29 of lever L1, wire 87, line wire 18 and 80 back to battery H. The circuit for valve F2 passes from battery H through wires 81, 82 and 83, contact 25 of lever L2, wire 67, contact 27 of lever L2, wires 89 and 100, contact 10 of lever L2, wire 101, line wire 62, asymmetric unit O1 in its low resistance direction, wire 45, 55 winding 10 of valve E6, wires 46 and 47, contact G6, wire 48, line wire 41, wire 64, contact 20 of lever L2, wires 73, 74 and 105, contact 29 of lever L2, wire 87, line wire 18 and 80 back to battery H. The circuit for valve E1 passes from battery H through wires 81, 82 and 83, contact 25 of lever L2, wires 99 and 105, contact 30 of lever L2, wire 101, line wire 62, wire 66, winding 10 of valve E1, wire 41, contact G1, wire 48, line wire 41, wire 64, contact 20 of lever L2, wires 73, 74 and 105, contact 29 of lever L2, wire 87, line wire 18 and 80 back to battery H. 

The energization of the valve E2 exhausts the fluid 55 that was previously supplied to the application end of motor M1, and the energization of valve F1 admits fluid to the restoring end of this motor. Piston 5 of motor M1 therefore moves to its left-hand position, thus restoring the braking bars of 69 the car retarder A1 to their non-braking positions. When piston 5 of motor M1 reaches its extreme left-hand position, contact G1 opens, and energizes the valves E1 and F1. In similar manner, the energization of the valve E2 exhausts 65 the fluid pressure that was previously supplied to the application end of motor M2, while the energization of valve F2 admits fluid pressure to the restoring end of motor M2. Piston 5 of motor M2 therefore moves to its extreme left-hand position, and restores the braking bars of the car retarder A2 to their non-braking positions. When piston 5 of motor M2 reaches its extreme left-hand position, contact G2 opens and interrupts the previously described circuits for the valves 75.
EF and FG, so that these valves now become deenergized. Lever LM may now be restored to its normal position, and when this is done, all parts will then be restored to the positions in which they are shown in the drawing.

It will be apparent from the foregoing, and from an inspection of the drawing, that the operation of the master controller lever LM to any position when the individual controller levers L1 and L2 both occupy their normal or N positions energizes the same one or ones of the valves D1, E1 and F1, and D2, E2 and F2 as would be energized if the individual controller levers L1 and L2 were both moved to positions corresponding to the position of the master controller lever. It will also be apparent from the foregoing that the circuits controlled by the master lever for energizing any of the valves D1, E1 and F1 are all carried over one or more of the contacts 20, 30, 31 and 32 of the lever L1, and the circuits controlled by the master lever for energizing the valves D2, E2 and F2 are all carried over one or more of the contacts 20, 30, 31 and 32 of the lever L2, and since the contacts 20, 30, 31 and 32 of the levers L1 and L2 are closed only when these levers occupy their normal positions, the movement of any individual controller lever away from its normal position will immediately render the control of the associated car retarder by the master controller lever ineffective and restore the control of such retarder to its associated individual controller lever. Conversely, when an individual controller lever is returned to its N or normal position from some other position, the associated retarder will immediately assume a position determined by the setting of the master controller lever.

Although I have herein shown and described only one form of apparatus for the control of railway car retarders embodying my invention, it is understood that various changes and modifications may be made therein within the scope of the appended claims without departing from the spirit and scope of my invention.

Having thus described my invention, what I claim is:

1. In combination, a plurality of car retarders, a plurality of fluid pressure motors, a plurality of individual controller levers one for each motor, a plurality of controller operating energy to the associated motor at a pressure which depends on which of said other positions the lever occupies, said last named means being effective only as to those motors whose associated individual levers are in and remain in their normal positions.

2. In combination, a plurality of car retarders, an operating motor for each car retarder, a plurality of electro-responsive devices for each motor for controlling the associated motor, an individual lever for each motor for selectively controlling the associated electro-responsive devices, each said individual lever having a normal position and a plurality of controlling positions, a master lever, and means for controlling said master lever independently of operation of said individual levers the electro-responsive control devices for all of those motors whose individual levers are in their normal position.

3. In combination, a plurality of car retarders, an operating motor for each car retarder, a plurality of electro-responsive devices for each motor for controlling the associated motor, an individual lever for each motor for selectively controlling the associated electro-responsive devices, each said individual lever having a normal position and a plurality of controlling positions, a master lever, and means for controlling said master lever independently of operation of said individual levers the electro-responsive control devices for all of those motors whose individual levers are in their normal position.

4. In combination, a plurality of car retarders, a fluid pressure operating motor for each car retarder, a plurality of fluid pressure motors for each motor for controlling the supply of fluid pressure to, and exhaust of fluid pressure from, the associated motor, an individual manually operable lever for each motor for selectively controlling the associated valves, each said individual lever having a normal position and a plurality of controlling positions, a master lever, and means controlled by said master lever for simultaneously selectively controlling the valves for all of those motors whose individual levers are in their normal position.

5. In combination, a plurality of car retarders, a fluid pressure motor for operating each car retarder, two magnet valves for each motor one for controlling the admission of fluid pressure to and the other for controlling the exhaust of fluid pressure from the motor, and means controlled by each individual lever for controlling the valves for the associated motor in a manner to supply such motor with fluid at a pressure which depends upon which of said other positions the lever occupies, a master lever having a normal position and a plurality of other positions, and means controlled by said master lever when this lever occupies any one of its other positions for selectively operating the valves for all those motors whose individual levers occupy their normal position in a manner to simultaneously supply such motors with fluid at a pressure which depends upon which of said other positions said master lever occupies.

6. In combination, a plurality of car retarders, a fluid pressure operating motor for each car retarder, a first valve for each motor for controlling the admission of fluid pressure to the motor, a second valve for each motor for controlling the exhaust of fluid pressure from the motor, and means controlled by each individual lever for controlling the valves for the associated motor in a manner to supply such motor with fluid at a pressure which the fluid builds up to a predetermined value which depends upon the position which the lever occupies, and for subsequently maintaining the pressure in said motor within predetermined limits until the lever is moved to another position, a master lever having a normal position and a plurality of other positions, and means controlled by said master lever when this lever is moved to any one of its other positions.
for selectively controlling the valves for each motor whose associated lever occupies its normal position in a manner to supply fluid pressure to such motor until the pressure builds up to a predetermined value which depends upon the position which the master lever then occupies, and for subsequently maintaining the pressure in such motor within predetermined limits until the master lever is subsequently moved to another position.

7. In combination, a plurality of car retarders, a fluid pressure motor for operating each car retarder, an application magnet for each motor effective when energized for admitting fluid pressure to the application end of said motor to operate said car retarder to its braking position, a restoring magnet for each motor effective when energized for admitting fluid pressure to the restoring end of the associated motor to operate said car retarder to its non-braking position, an exhaust magnet for each motor effective for exhausting fluid pressure from the application end or the restoring end of the associated motor according as the exhaust magnet is energized or deenergized, an individual controlling lever for each motor for selectively controlling the associated magnets, each said individual lever having a normal position and a plurality of controlling positions, a master lever, and means for selectively controlling by said master lever independently of operation of said individual levers the magnets for all those motors whose individual levers are in their normal positions.

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