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MEANS AND SIMULATED BRAKE

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2 Sheets-Sheet 1

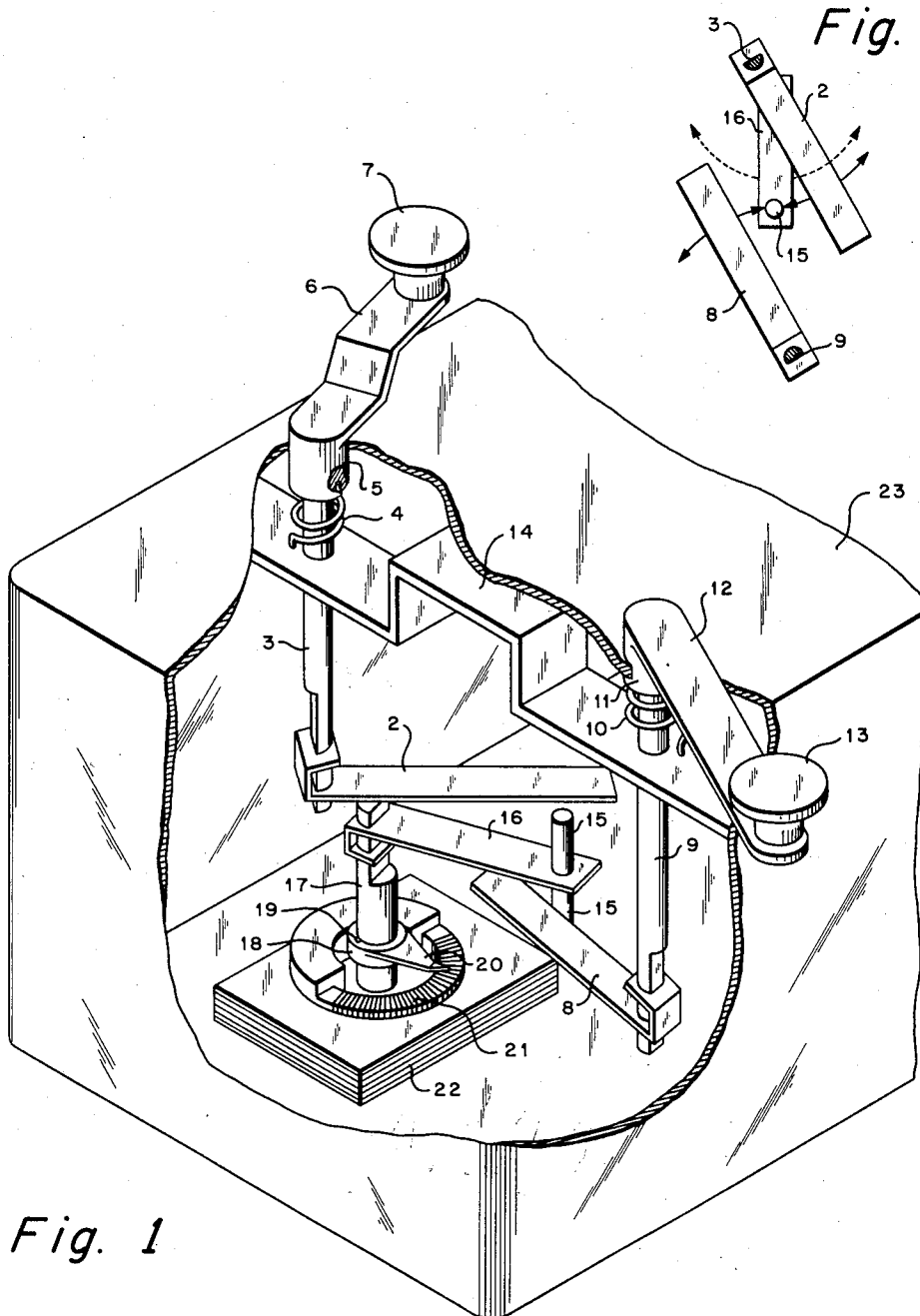


Fig. 1

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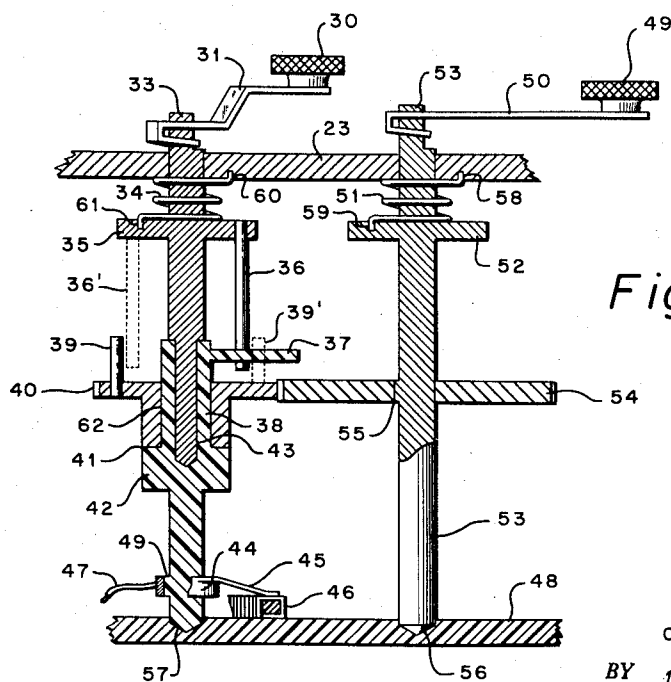
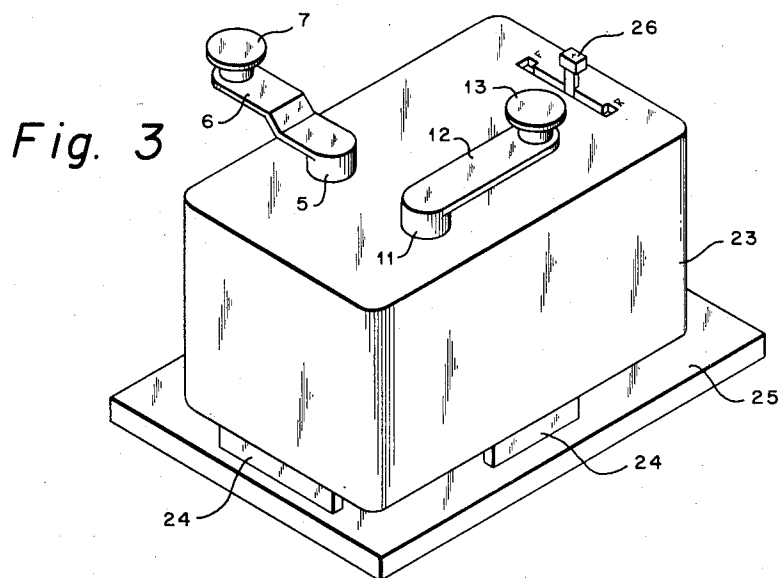
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CONTROLLER COMPRISING VOLTAGE REGULATING MEANS AND SIMULATED BRAKE

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5 Claims. (Cl. 201—48)

This invention relates to controls for model railroads. More particularly it relates to a control for an electrical model railroad designed to simulate closely the controls to be found on a full scaled locomotive.

A very popular type of model railroad is the type known as the H-O gauge. This is a small model train and is powered by an electric motor which drives the locomotive wheels through a worm and gear drive. It is naturally desired by model railroaders to achieve as much semblance of reality as possible in their systems. One shortcoming of the H-O gauge type in achieving reality is that due to the worm drive mechanism, when the controller is operated so as to cut off the current, the locomotive comes to a sudden and unrealistic halt.

It is the intent of this invention therefore, to provide an electrical controller to be operated by the model railroader which will comprise a unit corresponding to a locomotive throttle and a unit corresponding to a locomotive air brake. It is desired to arrange these controls so that when the throttle is cut, the locomotive will "coast" in the same manner as a full scale locomotive and will continue to do so until the "air brake" is applied. Thus the appearance of reality of the model railroad system will be enhanced.

It is an object of this invention to provide an electrical controller for a model railroad train comprising a simulated throttle and a simulated air brake.

It is another object of this invention to provide an electrical controller for a model H-O gauge worm-gear driven locomotive comprising a simulated throttle which is operative only to increase the voltage applied to the train's electric motor and a simulated air brake which is operative only to reduce the voltage applied to the train's electrical motor.

It is a still further object of this invention to provide a realistic simulated set of train controls to operate electrically driven model trains.

Other objects and aims of this invention will become apparent in the following specification.

The drawings, in which like numerals refer to like parts consist of:

Figure 1, which shows a partially broken-away view of the controller shown in perspective.

Figure 2, which is a schematic representation of the relative movement of the lever arms shown in Figure 1.

Figure 3, which is an overall perspective view of the entire controller, including the simulated controls and the transformer and rectifier.

Figure 4, is an elevation view, partially in cross section, showing an alternate embodiment of the simulated control mechanism.

The overall appearance of my controller is best shown in Figure 3. The casing or housing 23 is mounted on a mounting plate or base plate 25, being supported thereon by supports 24, of which two are shown in the drawing. The drawing shows the overall controller as a relatively unadorned rectangular box, but it is understood that its

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appearance may be similar to that of other controllers now on the market. Furthermore, the external appearance of this controller may be designed to closely approach or approximate the appearance of the controls of genuine locomotive equipment. Obviously, the decorative appearance of such a controller is beyond the scope of this patent and therefore this disclosure is limited to the means and principle for providing a simulated air brake and throttle controller. This invention relates to simulated operation, not to simulated appearance, and therefore controllers utilizing the principle or means, whatever their appearance, are within its scope.

A double pole, double throw, center off switch 26 is provided to operate the model train motor in a forward or reverse direction or to cut the circuit.

Simulated throttle arm 6 which has a collar 5 and a knob 7 is mounted on the casing 23. Simulated air brake control arm 12, having collar 11 and knob 13 is also mounted on the casing. It is understood of course, that these control arms may be shaped to resemble real full scale control arms and that the arms themselves or the surface over which they operate may be marked, labeled or calibrated in any convenient manner.

The simulated throttle-brake controller will normally be integral with a unit which also contains a selenium or other rectifier and a transformer. Obviously, the speed of the model train will be regulated by regulating the D. C. voltage applied to its motor, which in turn depends on the position of the variable transformer or of a separate rheostat within the controller. It is immaterial to this invention whether a variable transformer or a rheostat is used. It also is a matter of choice whether to incorporate my simulated throttlebrake with the other electrical equipment or to provide it in a separate casing. The controller shown in Figure 3 would, of course, have binding posts, terminals or other connecting elements to connect it to the power source and to the model train motor circuit.

The structure and operation of the preferred embodiment of the invention is best explained in connection with Figure 1. A support bracket 14 is provided within the casing 23 between two of its vertical walls. The throttle arm 6 has a collar 5 which is fitted over a vertical shaft 3. This shaft 3 is adapted for rotational movement and is aligned and guided by passing through an aperture in the support 14. The collar 5 is affixed to shaft 3 by means of a press fit or any other convenient means. The shaft 3 is precluded from vertical motion because collar 5 bears on the top surface of casing 23, or because shaft 3 itself has a shoulder (not shown) which bears on the upper surface of support 14, or both.

In a similar manner, the brake arm 12 has a collar 11 which is fastened to another vertical shaft 9. This shaft is positioned in exactly the same manner as described in connection with shaft 3.

At or near the lower end of shaft 3, a horizontal lever bar 2 is affixed. This lever bar may be attached to the shaft in any convenient manner. In the embodiment illustrated, the lever bar is shown as an elongated strip of sheet metal bent back over itself at one end. The shaft 3 is shown recessed or keyed at its lower end to the cross-sectional form of a semi-circle and the lever bar 2 is shown having a corresponding set of apertures through itself and its bent over section. The shaft is inserted into the lever bar apertures with a press or force fit, thus holding the lever bar firmly on the shaft. In a similar manner, the horizontal lever bar 8 is firmly affixed at or near the lower end of the other vertical shaft 9.

At the bottom of the casing 23, a transformer is provided. In Figure 1, the plate bank 22 of this trans-

former is shown. On the upper surface of the transformer plate bank, a rheostat is provided comprising a winding 21 and a wiper arm or sliding contact 20. The wiper arm 20 is mounted on a collar 18 which is keyed to the vertical post 17 by means of a key 19. Wiper arm 20 is also electrically connected by a lead (not shown) to the exterior binding posts or terminals.

The vertical post 17 is extended above the rheostat and at or near its upper end a control bar 16 is affixed thereto. Control bar 16 may be affixed to the post 17 in any convenient manner, but is here shown as an elongated metal strip bent over on its self at one end and having a set of apertures therethrough which fit the corresponding recessed or keyed section on the post 17, in the same manner as has been described in connection with vertical shafts 3 and 9.

It is understood that the control bar and the lever bars may be of any convenient construction, provided their functional inter-relationship is maintained.

A pin 15 extends through the control bar 16 in a generally vertical plane and is affixed at or near the end of the control bar remote from the bent over end in any convenient manner, such as by force or press fit. The lever bar 2 moves in a generally horizontal plane when the shaft 3 is rotated and this plane is above control bar 16. Lever bar 8 moves in a generally horizontal plane when shaft 9 is rotated and this plane is below control bar 16. The pin 15 extends vertically above the control bar 16 a distance sufficient so that it intercepts the plane of motion of lever bar 2 and it extends vertically below control bar 16 so that it intercepts the plane of motion of lever bar 8.

Reference to Figure 2 as well as Figure 1 will be helpful and understanding the operation of the controller. When the throttle arm 6 is moved in a clock-wise direction, the lever arm 2 also moves in a clock-wise direction and strikes the pin 15, thus moving control bar 16 in a clock-wise direction. The motion of control bar 16 is indicated in Figure 2 by the dotted lines and the motion of the lever bars 2 and 8 is indicated by the solid lines. Conversely, when brake arm 12 is rotated in a clock-wise direction, the lever bar 8 moves in a clock-wise direction and strikes the pin 15, thus moving control bar 16 in a counter-clock-wise direction.

When lever bar 2 is rotated in a counter-clock-wise direction, it moves away from pin 15 and does not affect the position of control bar 16. When lever bar 8 is moved in a counter-clock-wise direction, it moves away from pin 15 and does not affect the position of control bar 16. Suitable stops are provided on the casing 23 or elsewhere to prevent either lever bar from being rotated away from pin 15 through 360° and thus striking the pin 15 from the opposite side.

A spiral spring 4 is provided around vertical shaft 3, attached at one end to support 14 and at the other to collar 5. Thus, when throttle arm 6 is rotated in a clock-wise direction, it moves against the tension of spring 4. When knob 7 is released, spring 4 returns throttle arm 6 and lever bar 2 in a counter-clock-wise direction until the stop is reached. In a similar manner, spring 10 is provided around shaft 9, attached at one end to support 14 and at the other end to collar 11. Brake arm 12 moves clock-wise against the tension of spring 10 and when knob 13 is released, brake arm 12 and lever bar 8 are returned in a counter-clock-wise direction by the spring 10 to the stop.

Thus, when the throttle is released, it returns to its off or low speed position in the same manner as a full-scale so-called "dead man's throttle." The model train then coasts, when the brake is applied, the model train slows down: if the brake is released before the model train has completely halted, the brake returns to the off position and the train continues at the reduced rate of speed, simulating a full-scale train which coasts freely when the air brake is not being applied. A close simula-

tion of reality is therefore achieved by the use of the above-described means.

It is understood that the embodiment shown in Figure 1, while a preferred form, is not the sole means contemplated in this invention. In Figure 4 is illustrated an alternative embodiment of the simulated air brake and throttle of this invention. This embodiment is shown in elevation, partially in cross section.

The controller housing or casing 23 and the housing 10 or casing base 48 are shown fragmented. It is understood that the controller also comprises vertical casing walls to support the upper surface of the casing. In Figure 4, the base 48 must be an insulator, though it is of course possible to consider 48 merely as an insulating plate and to provide an additional exterior housing base beneath it.

The simulated throttle consists of a throttle knob 30 on throttle arm 31 and the simulated brake consists of a brake knob 49 on brake arm 50.

The brake arm 50 is affixed to a vertical shaft 53 by any convenient means. The shaft 53 as shown in the embodiment of Figure 4 is rotatably positioned on the base 48 by means of shaft pivot 56. A flange 52 is located on shaft 53 a short distance below upper casing surface 23. A spiral spring 51 is positioned around shaft 53 between upper casing surface 23 and flange 52 and is secured to the casing and the flange by spring catches 58 and 59 respectively.

At a point on the shaft 53 below the flange 52 is positioned a brake gear or friction wheel 54. This gear or wheel 54 is keyed to the shaft by key 55. Its function will be explained below.

The simulated throttle is secured to vertical shaft 33 in any convenient manner. Shaft 33 is rotatably positioned through casing 23.

A flange 35 is located on shaft 33 below upper housing surface 23. A spiral spring 34 is positioned around the shaft 33 between housing 23 and flange 35 and is secured to the housing and flange by spring catches 60 and 61 respectively. A vertical throttle pin 36 is affixed to flange 35 and depends downwardly therefrom.

A lower shaft 62, positioned on housing base 48 by shaft pivot 57 is located concentrically with vertical shaft 33. This lower shaft has a shoulder 41 and a central hollow 43. The vertical shaft 33 is reduced in diameter so that it may be inserted into the central hollow 43 of lower shaft 62. The reduced portion of shaft 33 has a loose fit with central hollow 43 so that rotary motion of shaft 33 is not communicated by this means to lower shaft 62. Shaft 62 has a cylindrical extension 38. At or near the upper edge of the cylindrical extension is extension lever 37. The horizontal plane of extension lever 37 intercepts the throttle pin 36.

A throttle gear or friction wheel 40 is seated on shoulder 41. The seating of gear or wheel 40 on the shoulder 41 and around shaft 62 is loose so that rotation of gear or wheel 40 will not be communicated by this means to lower shaft 62. A vertical brake pin 39 is affixed in the gear or wheel 40 and the horizontal plane of extension lever 37 intercepts brake pin 39.

A winding 46, located on the base 48, governs the voltage supply to the model train motor and hence governs the model train's speed. A wiper arm 45, connected to lead 47 is provided and adapted to move along winding 46 whereby the resistance and hence the voltage is varied. The wiper arm 45 is firmly affixed to lower shaft 62 by collar 44 so that the wiper arm rotates with the shaft.

When the throttle arm is at its zero (off or lowest speed) position, the spiral spring 34 biases it so that the pin 36 is in the alternate position 36', shown in phantom. At that position, the pin does not intercept the extension lever 37. When the throttle arm is rotated the pin 36 intercepts the extension lever 37 and if rotation of the throttle arm is continued, the extension lever 37 is rotated. Thus, the lower shaft 62 and hence the wiper arm

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45 are rotated thus increasing the voltage supplied to the model train motor. When the throttle is released, the spring 31 returns the pin 35 to its position 36'. The wiper arm will be left in the position of its furthest advance and therefore, when the throttle is released, the train will continue to run, giving the appearance of coasting.

When the brake arm 50 is in its zero or off position, the brake pin 39 is in the position shown in Figure 4. At this position, it does not intercept the extension lever 37. The spring 51 biases the brake arm to this position. When the brake is rotated against the spring, the gear or friction wheel 54 is rotated. This wheel or gear meshes with or frictionally engages the gear or wheel 40 and rotates it. Thus, when the brake is rotated, the brake pin 39 rotates and intercepts the extension lever 37 from the side opposite to that of the interception of pin 36. The brake pin at its point of interception of lever 37 is shown at 39' in phantom. The rotation of pin 39 rotates lever 37 in the direction opposite to that of the throttle arm so that the wiper arm 45 is rotated to reduce the voltage supplied to the model train motor. Thus, when the brake arm is operated, the model train slows down, giving the appearance of being braked.

It is apparent that there are many embodiments possible to perform the function described above. The scope of this invention is to be determined by the appended claims and not limited to the described and illustrated embodiments, which are illustrative and not limiting.

I claim:

1. A controller for electric motor driven model vehicles wherein said motor's speed is a function of the voltage supplied thereto comprising means to regulate the voltage supplied to said motor, a simulated throttle operatively connected to said voltage regulating means operative only to increase said voltage, and a simulated brake operatively connected to said voltage regulating means operative only to decrease said voltage, whereby said simulated throttle appears to have the function of a full-scale vehicle throttle and said simulated brake appears to have the function of a full-scale vehicle brake.

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2. A controller as defined in claim 1 wherein said voltage regulating means is stable in the position at which it is set, said simulated throttle has a high extreme position and a low extreme position and is mechanically biased toward its low position, and said simulated brake has an off position and is mechanically biased toward its off position, whereby said vehicle will appear to coast when said throttle is released, and slow down when said brake is applied.

3. A controller as defined in claim 2 wherein said voltage regulating means consists of a rheostat, said rheostat comprises a wiper arm and a set of windings, said wiper arm being movable along said windings, means attached to said wiper arm to move said wiper arm, means attached to said throttle adapted to contact and move said wiper arm moving means only in one direction, means attached to said brake arm adapted to contact and move said moving means only in the direction opposite to that in which the said moving means is movable by said throttle means.

4. A controller as defined in claim 3 wherein said wiper arm moving means comprises a control bar and a pin extending from said bar, and said throttle means comprises a lever bar having a plane of motion intercepting said pin and said brake means comprises a lever bar having a plane of motion intercepting said pin.

5. A controller as defined in claim 3 wherein said wiper arm moving means comprises a control shaft, a cylindrical extension on said shaft, and an extension lever affixed to said cylindrical extension, and said throttle means comprises a pin having a plane of motion intercepting said extension lever, and said brake means comprises a train of rotatable mutually contacting wheels and a pin affixed to one of said wheels and having a plane of motion intercepting said extension lever.

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