An improved coupler for model trains is disclosed that provides for remote control vertical movement of a moveable coupler box. The improved coupler allows cars of a train to be coupled or uncoupled at any location along the track. An NMRA compliant DCC control system located on board a linkable car is used to receive the remote control signal, and a circuit, motor, and linkage are provided to translate function commands into up and down vertical movements of the moveable coupler box. Addressing is provided to control which car of the train is to be decoupled.
COUPLER FOR MODEL TRAINS

FIELD OF THE INVENTION

This invention generally relates to trains. More particularly, it relates to a coupler mechanism for a model train. Even more particularly, it relates to knuckle coupler mechanisms and to remote control systems that permit model trains to be coupled and decoupled at any location on a track.

BACKGROUND OF THE INVENTION

Model trains have traditionally been coupled together with knuckle coupler mechanisms that have required either manual intervention by the human operator for decoupling adjacent cars or require special decoupling ramps located at specific locations along the track. The ramp can include a mechanism to magnetically rock one of the knuckles upward by magnetic repulsion to effect uncoupling, as described in U.S. Pat. No. 3,840,127 (“the '127 patent’). The upward rocking of one of the couplers can also be provided with a manually operable lifting ramp located in the track way. Couplers in which interlocked jaw members are swung laterally for uncoupling through magnetic attraction exerted an uncoupling station are also mentioned in the '127 patent.

One type of coupler that uses an uncoupling ramp is the National Model Railway Association (NMRA) horn-knuckle coupler. An insert is located between the rails of track and a pair of spaced apart wires which extend above the insert serve to uncouple two cars when the couplers on the cars are backed toward the wires, as described in U.S. Pat. No. 5,775,524 (“the ’524 patent”). A remotely operated decoupler is also described in the ’524 patent in which a bar magnet is placed in between the rails or an electromagnet is placed beneath the support for the track, which enables an operator to remotely uncouple cars located over the uncoupling ramp.

A scheme for remote and self-contained uncoupling in which an electromotive actuator is activated by a signal receiving mechanism is also described in the ’524 patent. In this scheme, a connector extends between the electromotive actuator and the coupler for shifting the coupler between its uncoupled position and its uncoupled condition. Power for remote uncoupling can be carried on board or collected from energized rails of the model railroad.

Another scheme for self-contained decoupling was provided in U.S. Pat. No. 5,826,736 that uses two different mechanisms to move a pin from engagement with the knuckle, allowing the knuckle to freely move to an uncoupled position. In one of the mechanisms a radio controlled solenoid located on board the car provides a magnetic force to move the pin. In the other mechanism an electromagnet on the track controls decoupling.

An alternate solenoid scheme for remote controlled decoupling anywhere on the track is described in U.S. Pat. No. 6,457,681 to avoid the need for provision of a high voltage through the tracks for decoupling. In this scheme a remote control sends the decoupling command over the track to an engine board and processor on the engine board. The processor receives the de-couple command and in response pulses the track voltage to lead wires to energize a solenoid that provides for a knuckle to be forced outwardly into the open position. However, a complex set of mechanisms is required to provide the lateral movement of the knuckle for de-coupling.

Thus, a better system for decoupling cars of a train is needed to provide a way for cars to be remotely disengaged at any location on the track without substantial mechanical complexity, and this solution is provided by the following invention.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a remote controlled scheme for decoupling anywhere on the track that provides for vertically moving an element of a knuckle coupler on one linkable car with respect to an element of a knuckle coupler on an adjoining linkable car;

It is a further object of the present invention to provide a remote controlled mechanism on board a car to move an element of a knuckle coupler vertically;

It is a further object of the present invention to provide an NMRA compliant DCC control system capable of decoupling a first car from a second car at any location on the track by moving an element of a knuckle coupler vertically;

It is a further object of the present invention to provide for decoupling of a locomotive or of any desired linkable car of a train;

It is a feature of the present invention that the mechanism for vertically moving an element of a knuckle coupler is controlled by a motor;

It is a further feature of the present invention that the mechanism for vertically moving an element of a knuckle coupler includes a cam;

It is an advantage of the present invention that no manual intervention is required to decouple cars of a train;

It is a further advantage of the present invention that cars of a train can be remotely decoupled at any position on the track; and

It is yet another advantage of the present invention that standard train couplers can be used with the present invention while providing remote controlled movement to those couplers for decoupling.

These and other objects, features, and advantages of the invention are accomplished by a plurality of linkable cars comprising a mechanism for coupling or decoupling a first linkable car and a second linkable car. The mechanism includes a first element on the first linkable car and a second element on the second linkable car. The first element includes a first member and the second element includes a second member. The first member is for coupling to the second member. The first element further comprises an on-board system for providing a vertical movement to the first member for vertically disengaging the first member from the second member for decoupling the first linkable car from the second linkable car, wherein the on-board system is operated by an external signal.
Another aspect of the invention is a mechanism for coupling and decoupling a first linkable car and a second linkable car. The mechanism comprises a vertical shaft and a moveable coupler box. The vertical shaft is mounted to the first linkable car. The moveable coupler box is capable of moving vertically on the vertical shaft.

Another aspect of the invention is a plurality of linkable cars that can be decoupled under control of a remote control device that can transmit a control signal includes a first linkable car and a second linkable car. A first vertically moveable coupler and an on-board system are on the first linkable car. A second coupler is on the second linkable car. The on-board system is capable of receiving the control signal transmitted by the remote control device and of moving the first moveable coupler in response to the received control signal.

Another aspect of the invention is a plurality of linkable cars that can be decoupled under control of a remote control device that can transmit a control signal. A first linkable car includes an NMRA compliant DCC control system that can receive the control signal. The first linkable car also includes a coupler capable of vertical movement. The NMRA compliant DCC control system is linked to the coupler for controlling vertical position of the coupler.

Another aspect of the invention is a plurality of linkable cars, comprising a plurality of moveable couplers. Each of the moveable couplers is linked to an on-board system for remotely controlling position of that moveable coupler. Each of the on-board systems includes an address for selecting which of the moveable couplers is to have its position changed to provide for coupling or decoupling.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, features, and advantages of the invention will be apparent from the following detailed description of the invention, as illustrated in the accompanying drawings, in which:

FIG. 1a is a side view of linkable cars connected together with the moveable coupler box of the present invention in its raised position;

FIG. 1b is a side view of linkable cars disconnected with the moveable coupler box of the present invention in its lowered position;

FIG. 2 is a bottom view of the linkable cars of FIG. 1a;

FIG. 3a is a front view of the linkable cars of FIG. 1a, and

FIG. 3b is a front view of the linkable cars of FIG. 1b;

FIG. 4 is a diagram showing the control circuit for the motor of FIG. 1b;

DETAILED DESCRIPTION OF THE INVENTION

The present inventors recognized that standard model train knuckle couplers could be decoupled remotely by providing a vertical movement to one element of the coupler with a car-mounted remotely controlled actuator connected to one of the couplers. They designed a linkage between a motor and the coupler to provide the vertical movement from rotation of the motor. They also provided command hardware to direct operation of the motor from a remote National Model Railroad Association (NMRA) compliant Digital Command Control (DCC) control system, one of the standard control systems used for model trains.

As used in this patent application the term “linkable car” includes any locomotive, box car, oil car, flat car, passenger car, tractor, trailer, or other vehicle that is linkable with another vehicle.

Linkable car 20a includes fixed coupler box 22a attached to underside 24a of linkable car 20a, as shown in FIG. 1a. Fixed coupler box 22a is attached to underside 24a of floor 25a of linkable car 20a in the standard manner, such as with fasteners, such as screws, or with an adhesive.

Shank 26a extends from coupler box 22a, and standard automatic knuckle coupler 28a is connected to shank 26a with pivot pin 30a, as shown in FIG. 1a and FIG. 2.

Linkable car 20b that is shown connected to linkable car 20a in FIG. 1a and FIG. 2, has pivoting knuckle coupler 28b of linkable car 20b interlocked with pivoting knuckle coupler 28a of linkable car 20a. Pivoting knuckle coupler 28b is connected to moveable coupler box 22b through shaft 26b. In one embodiment, shown in FIGS. 1a, 1b, 2, 3a, 3b, moveable coupler box 22b is slideably connected to post 32 which is connected to a threaded hole (not shown) on underside 24b of linkable car 20b.

Moveable coupler box 22b is capable of sliding up and down along post 32 as determined by the positions of coupler control motor 34, cam/eccentric 36, and linkage 38. Cam/eccentric 36 is connected to shaft 40 of coupler control motor 34. Linkage 38 extends between cam/eccentric 36 and moveable coupler 22b. Linkage 38 extends through a small hole in moveable coupler 22b and is fixed to coupler 22a by coupler height adjust nut 41. Cam/eccentric 36 is fabricated of a material such as plastic or brass. Spacing between the center of rotation 42 of cam/eccentric 36 and mounting position 43 of linkage 38 is approximately 12.5 mils larger than needed for the vertical dimension of coupler 22b to provide adequate vertical movement of moveable coupler box 22b to clear fixed coupler box 22a when cam/eccentric rotates through 180 degrees. Thus, if moveable coupler box has a dimension of 0.155 inches, sufficient clearance is achieved by providing linkage mounting position 43 located 0.090 inches from center of rotation 42 to provide a vertical movement of 0.180 inches when cam/eccentric rotates through 180 degrees. Linkage 38 is fabricated of a material such as spring steel, typically about 25 mils (0.025 inch) in diameter, though the exact diameter is not critical.

When coupler control motor 34 turns motor shaft 40 one half turn clockwise, as shown in FIG. 3a, moving cam/eccentric 36 in upward position U (FIGS. 1a and 3a), linkage 38 is pulled up, pulling coupler height adjust nut 41 up so moveable coupler box 22b moves up along post 32. Coupler height adjust nut 41 is a small nut at the end of linkage 38 whose position on linkage 38 can be adjusted to fine trim the final height of coupler box 22b. Thus, moveable
coupler box 22b is in-line with fixed coupler box 22a on linkable car 20a, as shown in FIG. 1a. This provides knuckle couplers 28a, 28b aligned, and linkable cars 20a, 20b can now be coupled together, and with moveable coupler box 22b in up position, they can remain coupled together.

Pivot pins 30a, 30b on pivoting knuckle couplers 28a, 28b, permit the cars to be connected or reconnected to each other in the standard manner by driving linkable cars 20a, 20b toward each other with sufficient force so when aligned knuckle couplers 28a, 28b strike each other, they pivot apart in the horizontal plane and then latch with each other.

Linkable cars 20a and 20b are disconnected when coupler control motor 34 turns motor shaft 40 one half turn, moving cam/eccentric 36 to downward position D. This forces linkage 38 down, which slides moveable coupler box 22b down along post 32 so knuckle coupler 28b on linkable car 20b extends below knuckle coupler 28a on linkable car 20a, as shown in FIG. 1b and FIG. 3b. When moveable coupler box 22b is down out of alignment with fixed coupler box 22a, as shown in FIG. 1b, the cars are disconnected and they can be moved away from each other.

Up stop 44 is provided to limit movement of cam/eccentric 36 to a position just past top dead center so that linkage 38 cannot be driven back downward when coupler control motor 34 is directed to turn clockwise to provide an up direction, as shown in FIG. 3a. With cam/eccentric 36 physically restricted from further clockwise movement by stop 44, moveable box 22b is held in the up position until a new command is issued to move down. A position just past top dead center for a vertically mounted cam provides an up lock. Similarly, down stop 46 is provided to limit movement of cam/eccentric 36 to a position at approximately bottom dead center so that linkage 38 cannot be driven back upward when coupler control motor 34 is directed to turn counterclockwise to provide a down direction, as shown in FIG. 3b. With cam/eccentric 36 physically restricted from further counterclockwise movement by stop 46, moveable box 22a is held in the down position until a new command is issued to move up.

Coupler control motor 34 is mounted on ceiling 50, along vertical wall 52, or along floor 54b within linkable car 20b. Coupler control motor 34 can also be mounted to a frame extending mounted to the chassis of linkable car 20b. Linkage 38 extends between cam 36, which is connected to shaft 40 of coupler control motor 34, and moveable coupler 22b. Linkage 38 can also extend through hole 53 in floor 54b of linkable car 20b, as shown in FIGS. 1a, 1b so it can provide upward and downward movement to moveable coupler box 22b along post 32. Once coupler control motor 34 is mounted in a convenient location, linkage 38 can be directed from coupler control motor 34 to moveable coupler 22b, and bent as needed to get around intervening objects.

Post 32 is a smooth pin or shaft to permit moveable coupler box 22b to slide up and down along its surface. As moveable box 22b is fabricated of a slippery plastic such as Delrin, Acetal, or Nylon, that tends to be self lubricating, though any plastic compatible light oil, such as Labelle Industries 108 oil or Labelle Industries 134 Micro-Fine Powdered FITE may be applied to ensure free movement.

Post 32 can also be a threaded shaft with a nut (not shown) within moveable coupler box 22b. In this case motor shaft 40 may have a threaded shaft portion or a threaded shaft linkage can be provided to drive moveable coupler box 22b up and down within this nut with many turns of coupler control motor 34. In this case coupler control motor 34 may be mounted to the floor of linkable car 20b or to an inside or outside vertical wall of linkable car 20b.

Linkable cars 20a, 20b have wheels 62 that roll on track 63 and wheels 64 that role on track 65. Electrical energy and digital signals are provided from a standard control console (not shown) through tracks 63, 65 and wheels 62, 64 of linkable car 20b to provide remote power and remote control signals to control system 66 through connecting wires 68a, 68b. Control system 66 provides current to coupler control motor 34.

Coupler control motor 34 is capable of operation in forward and reverse depending on the direction current is directed. Coupler control motor 34 can be a Mabuchi RF-J20WA motor, available from Mabuchi. Coupler control motor 34 can also be a pair of solenoids arranged to alternately push and pull on linkage 38. Alternatively, compressed air or hydraulic devices can also be used.

Coupler control motor 34 is remotely controlled through decoder 70 and additional interface circuit 72. Decoder 70 receives power and remote control signals from a remote station (not shown) through tracks 63, 65 and wheels 62, 64 on linkable car 20b. Input signals to decoder 70 arrive on wires 67a and 67b from wheels 62, 64. Output signals from decoder 70 are provided to additional interface circuit 72 to provide current either to wire 74a or to wire 74b to control direction of operation of coupler control motor 34 to either rotate coupler control motor 34 clockwise or counterclockwise to either raise or lower moveable coupler box 22b through cam 36 and linkage 38. Decoder 70 can be a TEX SW9/12 HO Decoder, available from Tony’s Train Exchange, Essex Junction, Vt. Other decoders will also work in this application.

Coupler control motor 34 acts under direction of standard DCC decoder 70, operating under NMRA DCC standards, as well as additional interface circuit 72 which translates the standard decoder signals into a form that will make the coupler motor operate clockwise or counterclockwise. Decoder 70 uses power and ground connected to tracks 63, 65 through wheels 62, 64.

Standard decoder 70 includes a function output providing a positive power source labelled “common” in FIG. 4 (normally a BLUE wire). Decoder 70 also includes power return outputs F1 and F2. Each power return output F1, F2 includes an FET or bipolar transistor 76a, 76b that is turned ON to provide the decoder power return connection to ground when the associated function is active. The desired load is connected from the common power source to the drain or collector 76a, 76b of associated function output transistor 76a, 76b. When function F1 or F2 is active, the load connected to that function is connected from power common to ground through transistor 78a or through transistor 78b, and the load is energized. When the function output transistor 76a or 76b is inactive, the load connected to that function is connected only to the power common, and the load may be de-energized since it lacks a path to ground.

The present invention provides a method to provide a bi-directional controlled current from signals provided to
two mono-directional function outputs in order to control the
direction of rotation of coupler control motor 34, and
through it, the position of moveable coupler 22b.

[0048] Additional interface circuit 72 shown in FIG. 4
provides the current reversing function from two function
outputs of decoder 70. As described more fully below,
when F1 is active current flows to coupler control motor 34
in a direction to move the coupler down and when F2 is
active current flows to coupler control motor 34 in a direc-
tion to move the coupler up.

[0049] When F1 is active, base current flows from the
Decoder Common Function Output through base b2 of PNP
transistor Q2, through R2 and R1, and through the F1 output
to decoder ground. The values of R2 and R1 together
(summed value) are selected to ensure that sufficient base
current flows to force transistor Q2 into saturation. Saturat-
ing transistor Q2 connects R4 to the Decoder Common
Function Output through transistor Q2. Therefore, F1 active
enables a current path from the Decoder Common Function
Output, through R4, through coupler control coupler control
motor 34, and then through F1 output to decoder ground.
Coupler control motor 34 is configured such that current
flow in this direction results in a downward movement of
linkage 38 and moveable coupler box 22b. Note that when
transistor Q2 is on, base b1 of PNP transistor Q1 is forced
to rise to the same potential as emitter e1 of transistor Q1,
ensuring that transistor Q1 is kept off.

[0050] When F2 is active, base current flows from the
Decoder Common Function Output through the base b1 of
transistor Q1, through R3 and R4, and through the F2 output
to decoder ground. The values of R3 and R4 together
(summed value) are selected to ensure that sufficient base
current flows to force transistor Q1 into saturation. Saturat-
ing transistor Q1 connects R1 to the Decoder Common
Function Output through transistor Q1. Therefore, F2 active
enables a current path from the Decoder Common Function
Output, through R1, through coupler control motor 34, and
then through F2 output to decoder ground. Note that the
current flow through the coupler control motor in this case
is opposite to the direction of the current flow for the case
of F1 active. The result is that coupler control motor 34
moves in the direction opposite to the F1 case causing the
upward movement of linkage 38 and moveable coupler box
22b. Note that when transistor Q1 is on, base b2 of transistor
Q2 is forced to rise to the same potential as emitter e2 of
transistor Q2, ensuring that transistor Q2 is off.

[0051] The values of R1 and R4 are selected to limit the
amount of current through coupler control motor 34, pro-
tecting the motor from stall current exceeding its capability.
In the present case, the value is approximately 85 mA,
although other values could be used depending on the
requirements of coupler control motor 34. Note that the
current through coupler control motor 34 also flows through
either function output F1 or function output F2. R1 and R4
must limit the current to a value consistent with the ratings
of function outputs F1, F2 of decoder 70. Where more
current is required than available from decoder 70, decoder
function output transistors 76a, 76b can be replaced with
transistors rated at a higher current. R1 and R4 also provide
current limiting in the event that both function outputs are
accidentally operated at the same time. In this case, there is
minimal current supplied to coupler control motor 34, but
R1 and R4 limit the resulting current to a value that will not
damage decoder 70 or transistors Q1, Q2 in additional
interface circuit 72. R1 and R4 are sized to handle the
required power dissipation, which in this case is 1.3 watts,
so 2 watt resistors would be selected.

[0052] The previous discussion provides additional inter-
face circuit 72 so that coupler control motor 34 and move-
able coupler box 22b can be controlled from standard DCC
decoder 70. These features could also be incorporated into
the decoder logic itself to provide an integrated decoder/
interface circuit. Such a custom decoder could also incor-
porate features that might be unique to coupler control motor
34. Such features might include providing a large current to
move coupler control motor 34 and providing a smaller
continuous current to maintain coupler control motor 34 in
fixed position. Also, a lockout feature could be included to
prevent activation of up and down controls at the same time,
thereby eliminating potentially damaging stress on the
decoder and interface circuitry.

[0053] In one particular embodiment the coupler system of
the present invention is located in the locomotive and allows
decoupling the locomotive from the next linkable car in a
train, whatever that next linkable car may be. In this embodi-
ment moveable coupler box 22b is located on the locomo-
tive, and it can be decoupled from the next linkable car under
remote control using the DCC control system to vertically
move moveable coupler box 22b out of alignment with fixed
coupler box 22a on the next linkable car. Remote controlled
moveable coupler boxes can also be provided on some or all
of the other linkable cars of the train. They can be provided
at just one of the ends of each linkable car to link with a fixed
coupler box of an adjacent linkable car. They can also be
provided at both ends of some of the linkable cars so these
linkable cars can be decoupled under remote control from
other linkable cars that may just have fixed coupler boxes at
both ends.

[0054] With a DCC control system, each linkable car
equipped with this system can be provided with a unique
address so that the operator can decouple a specified linkage
independent of other linkages. Addressing can also be used to
individually control the state of other devices on each
linkable car individually, such as lights on or off and position
of mechanical systems on the individual cars, such as sliding
door position.

[0055] While several embodiments of the invention,
together with modifications thereof, have been described in
detail herein and illustrated in the accompanying drawings,
it will be evident that various further modifications are
possible without departing from the scope of the invention.
Nothing in the above specification is intended to limit the
invention more narrowly than the appended claims. The
examples given are intended only to be illustrative rather
than exclusive.

What is claimed is:

1. A plurality of linkable cars, comprising a mechanism
   for coupling or decoupling a first linkable car and a second
   linkable car, said mechanism including a first element on
   the first linkable car and a second element on the second
   linkable car, wherein said first element includes a first
   member and said second element includes a second member,
   said first member for coupling to said second member, and
   wherein said first element further comprises an on-board
system for providing a vertical movement to said first member for vertically disengaging said first member from said second member for decoupling the first linkable car from the second linkable car, wherein said on-board system is operated by an external signal.

2. A mechanism as recited in claim 1, wherein said on-board system provides that said first linkable car can be decoupled from said second linkable car at any location that said external signal can be received without manual intervention.

3. A plurality of linkable cars as recited in claim 1, wherein said on-board system provides said first member aligned with said second member for coupling and wherein said on-board system provides said first member vertically misaligned with said second member for decoupling.

4. A plurality of linkable cars as recited in claim 1, wherein said first member further comprises a first mounting mechanism, wherein said on-board system provides said first mounting mechanism with said vertical movement.

5. A plurality of linkable cars as recited in claim 1, wherein said on-board system comprises a decoder, a motor and a linkage to provide said vertical movement.

6. A plurality of linkable cars as recited in claim 5, wherein said encoder can decode standard DCC signals.

7. A plurality of linkable cars as recited in claim 6, wherein said on-board system further comprises an additional circuit to provide clockwise or counterclockwise rotation of said motor in response to a command received at said DCC decoder.

8. A plurality of linkable cars as recited in claim 7, wherein said additional circuit comprises a pair of transistors linked to each other to control direction current is provided to said motor.

9. A plurality of linkable cars as recited in claim 8, further comprising resistors to limit current to said motor.

10. A plurality of linkable cars as recited in claim 5, wherein said on-board system further comprises a cam to provide said vertical movement to said linkage from rotation of said motor.

11. A plurality of linkable cars as recited in claim 10, wherein said on-board system further comprises stops to limit movement of said cam.

12. A plurality of linkable cars as recited in claim 1, further comprising a mounting device, wherein said first member is mounted on said mounting device and wherein said first member is capable of moving with a vertical component of motion with respect to said mounting device.

13. A plurality of linkable cars as recited in claim 12, wherein said first member is capable of moving vertically on said mounting device.

14. A plurality of linkable cars as recited in claim 12, wherein said mounting device comprises a smooth shaft or a threaded shaft.

15. A plurality of linkable cars as recited in claim 14, wherein said shaft has vertical sidewalls.

16. A plurality of linkable cars as recited in claim 12, wherein said mounting device fits into said first member.

17. A plurality of linkable cars as recited in claim 1, wherein said first member has a knuckle shaped portion and wherein said second member has a knuckle shaped portion.

18. A plurality of linkable cars as recited in claim 17, wherein said knuckle shaped portion pivots horizontally to link with said second member.

19. A plurality of linkable cars as recited in claim 1, wherein said linkable cars are parts of a model railroad train.

20. A plurality of linkable cars as recited in claim 19, further comprising a track, wherein said external signal is provided through said track.

21. A mechanism for coupling and decoupling a first linkable car and a second linkable car, said mechanism comprising a vertical shaft and a moveable coupler box, said vertical shaft mounted to said first linkable car, said moveable coupler box capable of moving vertically on said vertical shaft.

22. A mechanism as recited in claim 21, further comprising a fixed coupler box mounted on said second linkable car.

23. A mechanism as recited in claim 21, further comprising an on-board system for providing a vertical movement to said moveable coupler box along said vertical shaft, wherein said on-board system is operated by an external signal.

24. A mechanism as recited in claim 23, wherein said on-board system comprises a remote controlled on-board DCC control system.

25. A mechanism as recited in claim 23, wherein said on-board system comprises a motor.

26. A mechanism as recited in claim 25, wherein upward vertical movement is provided by rotation of said motor in a first direction and downward vertical movement is provided by rotation of said motor in a second direction opposite said first direction.

27. A mechanism as recited in claim 25, wherein sufficient vertical movement to disengage said cars is provided by rotation of said motor one half turn.

28. A mechanism as recited in claim 21, wherein said moveable coupler box slideably moves on said vertical shaft.

29. A plurality of linkable cars that can be decoupled under control of a remote control device that can transmit a control signal, comprising a first linkable car and a second linkable car, a first vertically moveable coupler and an on-board system on said first linkable car, a second coupler on said second linkable car, wherein said on-board system is capable of moving said first moveable coupler vertically out of alignment with said second coupler to provide the decoupling, wherein said on-board system is capable of receiving the control signal transmitted by the remote control device and of moving said first moveable coupler in response to the received control signal.

30. A plurality of linkable cars as recited in claim 29, wherein said on-board system provides that said first linkable car can be decoupled from said second linkable car at any location that said signal can be received.

31. A plurality of linkable cars as recited in claim 29, wherein said on-board system comprises a decoder, a motor and a linkage to provide said vertical movement.

32. A plurality of linkable cars as recited in claim 31, wherein said decoder can decode standard DCC signals.

33. A plurality of linkable cars as recited in claim 32, wherein said on-board system further comprises an additional circuit to provide clockwise or counterclockwise rotation of said motor in response to a command received at said DCC decoder.

34. A plurality of linkable cars as recited in claim 33, wherein said additional circuit comprises a pair of transistors linked to each other to control direction current is provided to said motor.
35. A plurality of linkable cars as recited in claim 35, wherein said additional circuit further comprises resistors to limit current to said motor.

36. A plurality of linkable cars as recited in claim 31, wherein said on-board system further comprises a cam to provide said vertical movement to said linkage from rotation of said motor.

37. A plurality of linkable cars as recited in claim 36, wherein said on-board system further comprises stops to limit movement of said cam.

38. A plurality of linkable cars as recited in claim 29, further comprising a mounting device, wherein said first vertically moveable coupler is mounted on said mounting device and wherein said first vertically moveable coupler is capable of moving with a vertical component of motion with respect to said mounting device.

39. A plurality of linkable cars as recited in claim 38, wherein said mounting device comprises a smooth shaft or a threaded shaft.

40. A plurality of linkable cars as recited in claim 39, wherein said shaft has vertical sidewalls.

41. A plurality of linkable cars as recited in claim 39, wherein said mounting device fits into said first vertically moveable coupler.

42. A plurality of linkable cars as recited in claim 29, wherein said first vertically moveable coupler has a knuckle shaped portion and wherein said second coupler has a knuckle shaped portion.

43. A plurality of linkable cars as recited in claim 29, wherein said first vertically moveable coupler pivots horizontally to link with said second coupler.

44. A plurality of linkable cars as recited in claim 29, wherein said first linkable car and said second linkable car are part of a model railroad train.

45. A plurality of linkable cars as recited in claim 44, further comprising track, wherein said external signal is provided through said track.

46. A plurality of linkable cars that can be decoupled under control of a remote control device that can transmit a control signal, comprising a first linkable car including an NMRA compliant DCC control system that can receive the control signal, said first linkable car further including a coupler capable of vertical movement, said NMRA compliant DCC control system linked to said coupler for controlling vertical position of said coupler.

47. A plurality of linkable cars as recited in claim 46, wherein said NMRA compliant DCC control system further comprises a circuit to translate NMRA compliant DCC control system function commands into up and down vertical movements of said vertically moveable coupler.

48. A plurality of linkable cars as recited in claim 47, wherein said circuit comprises a motor.

49. A plurality of linkable cars as recited in claim 48, wherein said circuit further comprises elements to provide that said motor operates in a first direction to provide said upward movement and that said motor operates in a direction opposite to said first direction to provide said downward movement to said vertically moveable coupler.

50. A plurality of linkable cars, comprising a plurality of moveable couplers, each said moveable coupler linked to an on-board system for remotely controlling position of that moveable coupler, wherein each said on-board system includes an address for selecting which of said moveable couplers is to have its position changed to provide for coupling or decoupling.

51. A train as recited in claim 50, wherein each said on-board system comprises an NMRA compliant DCC control system.

52. A train as recited in claim 51, wherein each said on-board system comprises a circuit to translate NMRA compliant DCC control system function commands into a signal usable to provide movement of said moveable coupler.

53. A train as recited in claim 51, wherein said movement comprises a vertical movement.

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