

United States Patent

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[54] MODEL RAILROAD FREIGHT DUMPING CAR ASSEMBLY
7 Claims, 11 Drawing Figs.

[52] U.S. Cl..... 46/235.

46/214, 46/218, 46/243 S

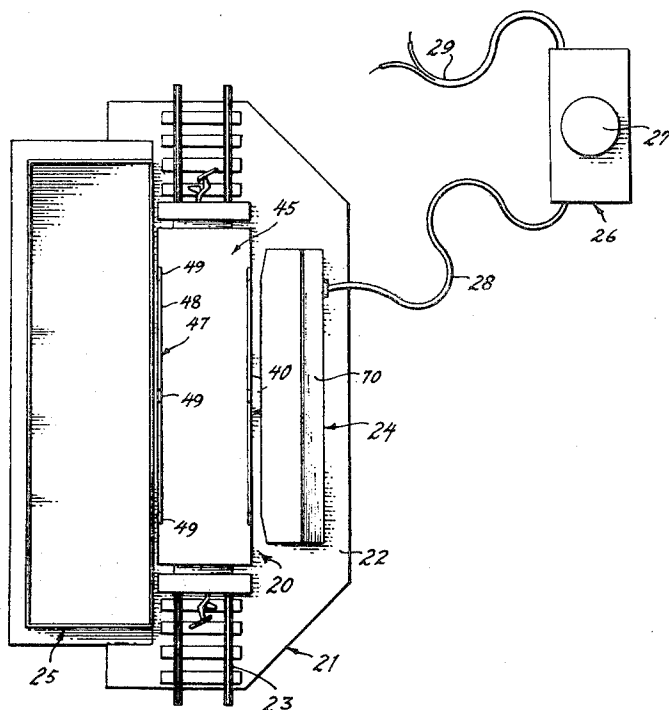
[51] Int. Cl. A63h 33/26.

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[50] **Field of Search**..... 46/12, 40,

202, 214, 243, 235, 218

ABSTRACT: A wheeled chassis carrying a swingable dumping body, the chassis having electromagnet means and the body carrying an armature cooperating with the electromagnet means to effect a swinging, dumping action upon energization of the electromagnet means.



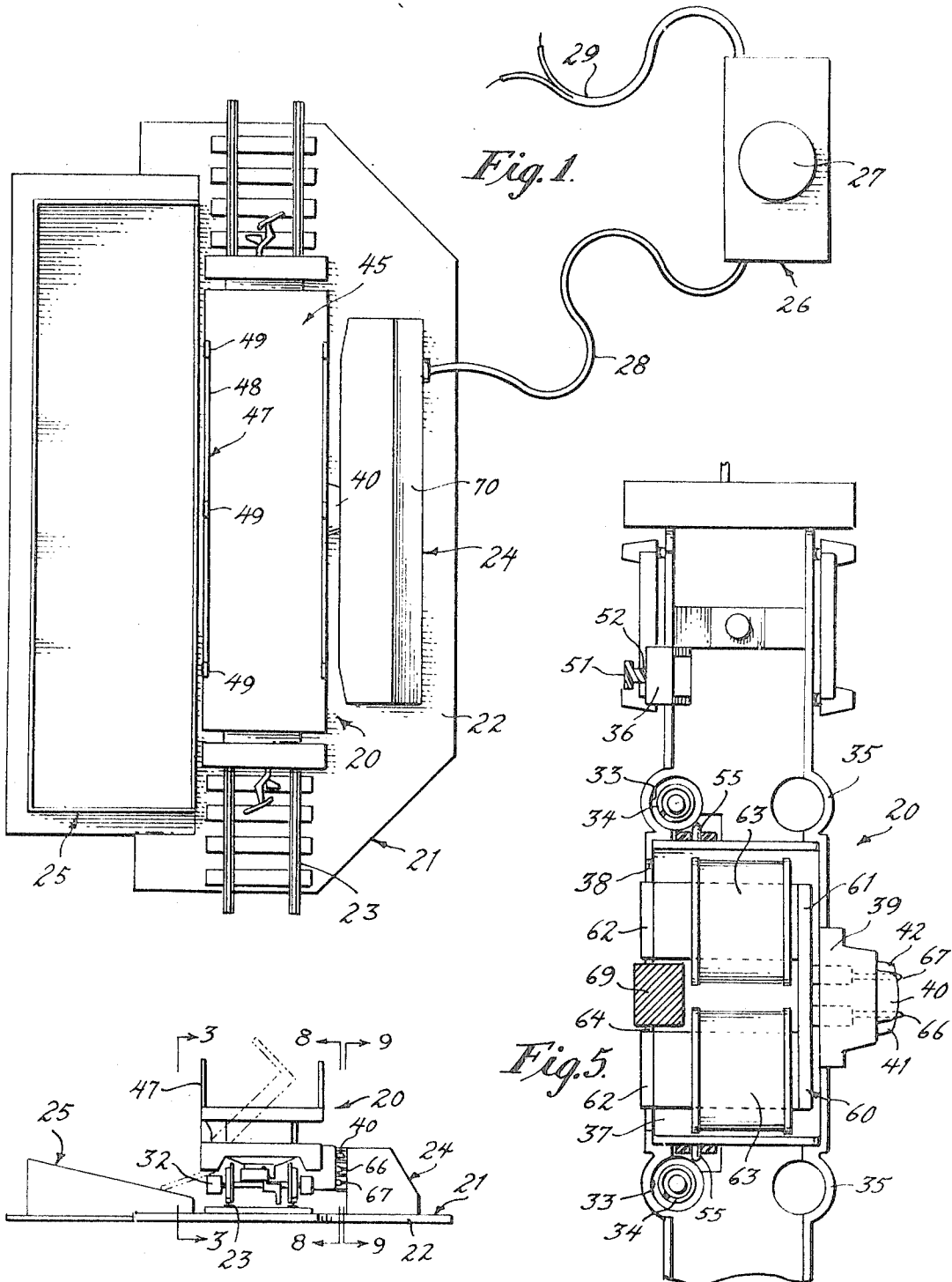


Fig. 2.

Fig. 5.

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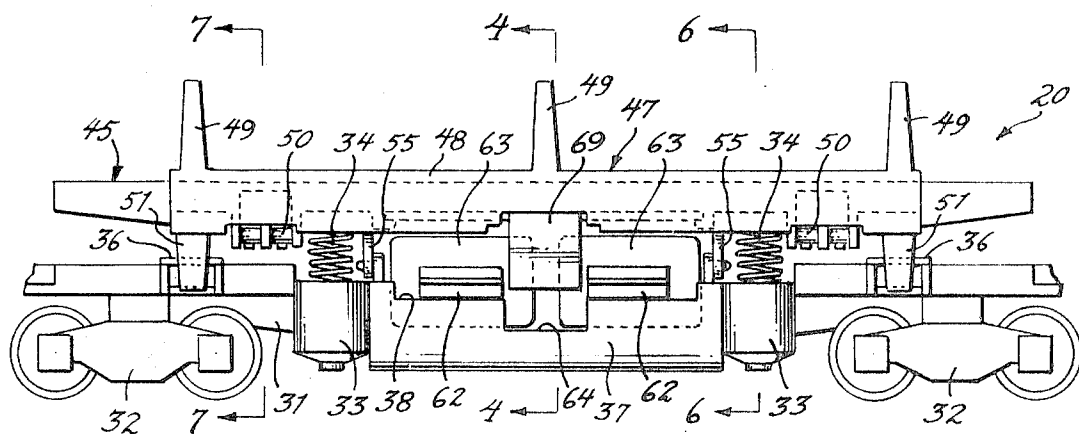


Fig. 3.

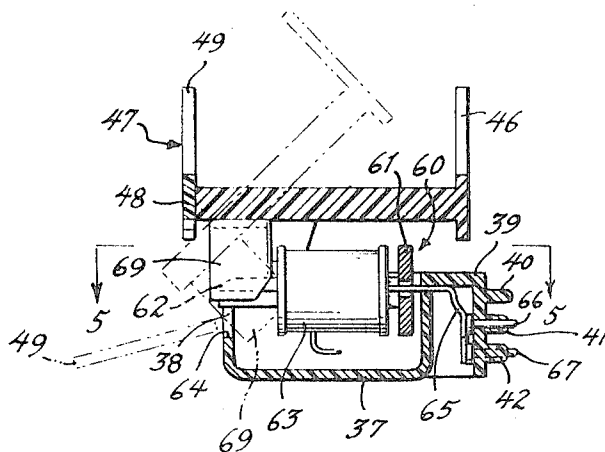


Fig. 4.

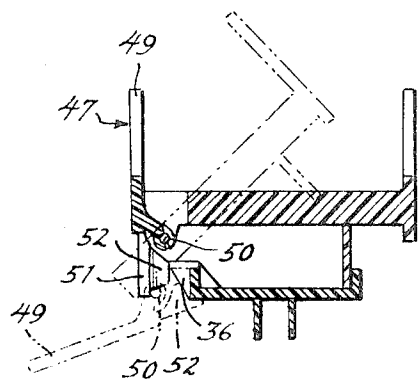


Fig. 5.

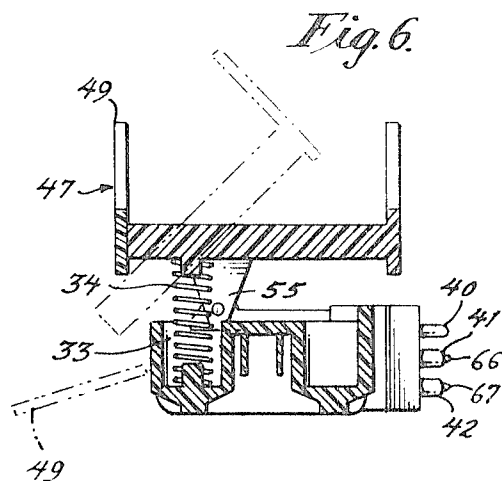
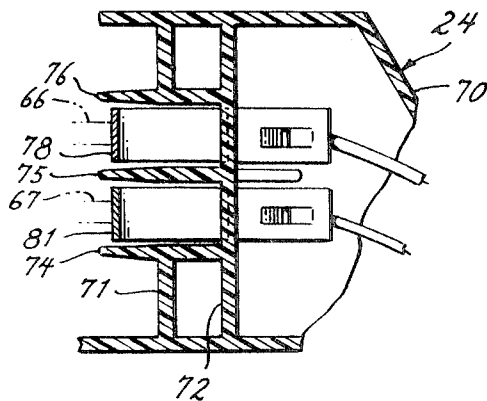
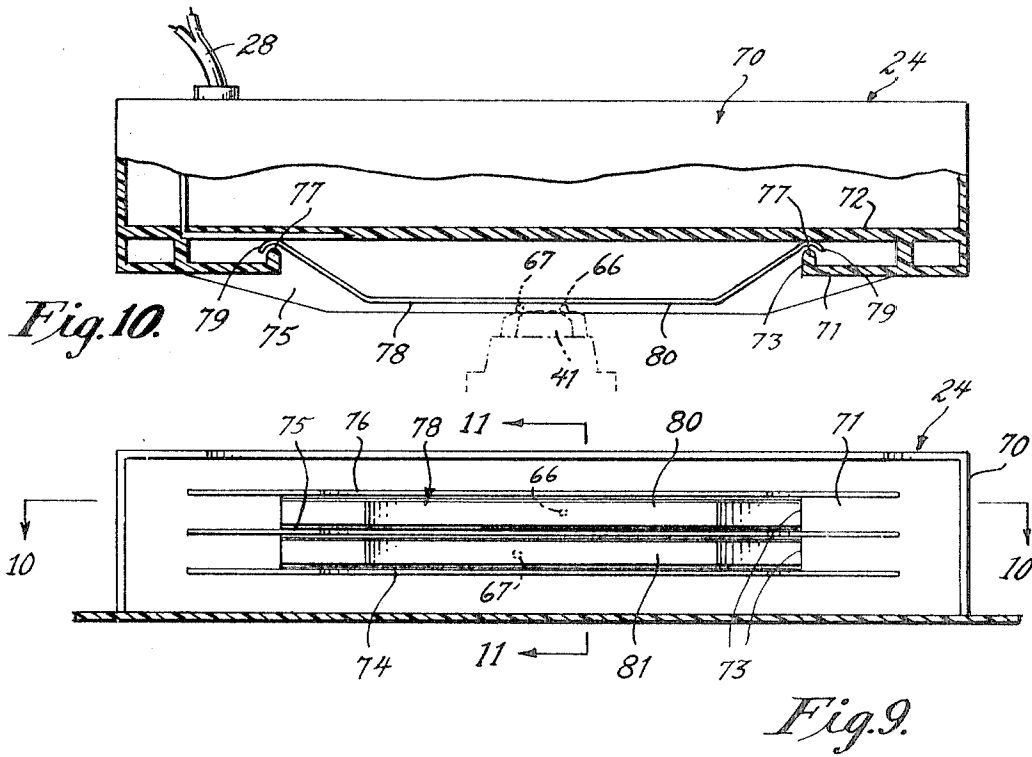
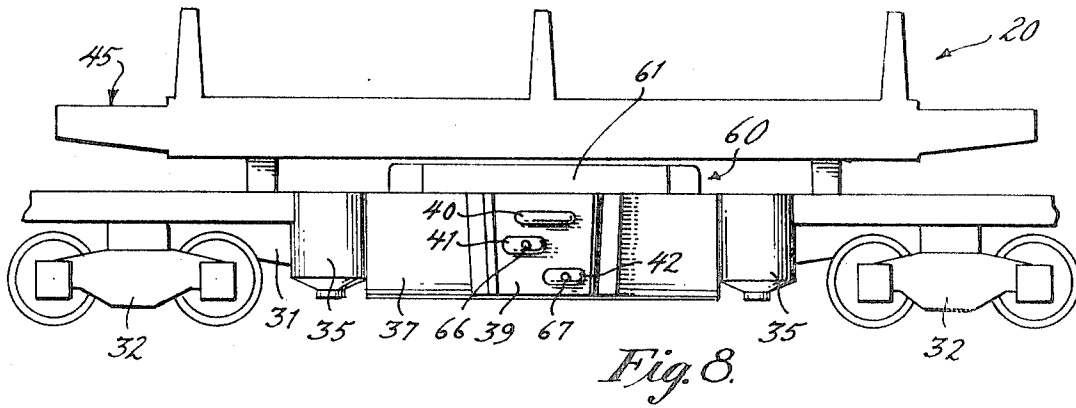


Fig. 6.

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MODEL RAILROAD FREIGHT DUMPING CAR ASSEMBLY

BACKGROUND OF THE INVENTION

While there are, in the prior art, many proposed automatic model railroad dumping cars, these prior devices have generally been relatively complex in construction, expensive to manufacture, and readily subject to malfunction.

In particular, the prior art model railroad dumping cars have required cams, plungers, and linkages, being relatively complex and expensive to manufacture, and lacking in reliability and long useful life.

SUMMARY

Accordingly, it is an important object of the present invention to provide a model railroad dumping car which is extremely simple in construction, utilizing only a pivotal action, and employing electromagnetic means in a combination and arrangement which requires relatively little space for complete compatibility of design with simulated full-size railroad cars, and which is inherently reliable and durable throughout a long usual life.

It is a further object of the present invention to incorporate in conjunction with the instant car construction a unique dumping station which includes connection to a power source for effecting the dumping action.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view showing a model railroad dumping car of the present invention in association with a dumping station for effecting the dumping operation.

FIG. 2 is an end view of the car and station of FIG. 1, illustrating the dumping action in phantom.

FIG. 3 is a longitudinal elevational view showing one side of the dumping car, enlarged for clarity.

FIG. 4 is a transverse sectional view taken generally along the line 4-4 of FIG. 3, illustrating the dumping condition in phantom.

FIG. 5 is a horizontal sectional view taken generally along the line 5-5 of FIG. 4.

FIG. 6 is a transverse sectional elevational view taken generally along the line 6-6 of FIG. 3, the dumping position being shown in phantom.

FIG. 7 is a transverse sectional view taken generally along the line 7-7 of FIG. 3, with the dumping position shown in phantom.

FIG. 8 is a longitudinal elevational view of the railroad car of FIG. 3, but showing the other side thereof.

FIG. 9 is a sectional elevational view taken generally along the line 9-9 of FIG. 2.

FIG. 10 is a horizontal sectional view taken generally along the line 10-10 of FIG. 9.

FIG. 11 is a transverse sectional view taken generally along the line 11-11 of FIG. 9.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more particularly to the drawings, and specifically to FIG. 1 thereof, a model railroad dumping car is there generally designated 20, and illustrated in position at a dumping station, generally designated 21. The dumping station includes a generally horizontal bottom plate or base 22 and a section track 23 resting on the base 22 extending lon-

gitudinally thereof. Along one side of the track 23, upstanding from the base 22 is a support, generally designated 24, for a purpose appearing presently. Along the other side of the track 23, adjacent to the base 22 and opposite the support 24 is a receptacle or open top load receiver 25.

An electric switch 26, including a push button 27 is connected by additional conductor means 29 to a source of electric power. The switch 26 will serve a function appearing presently, and is advantageously of the momentary contact type.

Considering the car 20 in greater where as shown in FIGS. 3-8, the car includes a generally horizontally disposed chassis or frame 31, which may constitute an elongate, generally horizontal platform having wheeled running gear or trucks 32 at its opposite ends. That is, the wheeled running gear 32 are carried on the underside of the chassis 31, being mounted in the usual manner, for rolling movement along a track.

The chassis 31 may be formed at a pair of spaced locations, at least along one side, with upwardly opening receivers 33 for receiving the lower ends of generally vertically disposed respective coil compression springs 34. This is best seen in FIGS. 3, 5 and 6. It will also appear in FIGS. 5, 6 and 7, that a similar pair of spaced upwardly opening receivers 35 may be formed in the chassis 31 on the other side thereof. This affords accurate simulation and symmetry to the chassis.

At spaced locations along the side of chassis 31 having receivers 33, and located longitudinally outward thereof, are a pair of laterally outstanding generally triangular cams 36, best seen in FIGS. 3, 5 and 7. The medial region of the chassis 31, as between the receivers 33 and 35, is in the form of an upwardly opening, relatively large receptacle 37. One side of the receptacle 37 is cut away, as at 38, best seen in FIGS. 3 and 4, while the other side of the receptacle 37 is provided with a protuberant housing 39 having a plurality of vertically spaced laterally outstanding external lugs 40, 41 and 42, see FIGS. 4, 6 and 8.

The above-described construction of chassis 31 may all be integrally formed of plastic, say by injection molding, or otherwise fabricated of any suitable material.

An elongate, upper carrier part or body is generally designated 45 and is superposed in spaced relation over the chassis 31. The body 45 is illustrated herein as of a flattop type, but may be of other design, such as a gondola or otherwise. The body 45 may be provided on one side with upstanding posts or stakes 46 fixed in position, and provided on the other side with a barrier 47 including a longitudinally extending side rail 48 and a plurality of longitudinally spaced posts 49 upstanding from the side rail. The side rail 48 of the barrier 47 is pivotally connected to the platform of the body 45, as by a pair of longitudinally spaced, axially aligned hinges 50 on the underside of the body. By this hinged connection of barrier 47 to body 45, the barrier is swingable between the solid line upstanding position of FIGS. 3, 4, 6 and 7, to the outwardly and downwardly swung phantom position of FIGS. 4, 6 and 7.

In addition, the barrier 47 is provided with a pair of depending fingers or the follower elements 51, each having a suitable configuration, as at 52 in FIG. 7, for following engagement with a respective cam 36. By this following engagement of follower elements 51 with cams 36, the barrier 47 is maintained upright in the solid line horizontal position of body 45, and released for downward and outward swinging movement in the inclined, phantom position of the body.

For movement of the body 45 between its solid line and phantom positions, the body is mounted on the chassis 31 by means of a pair of spaced pivotal connections 55. That is, the pivotal connections or hinges 55 are located longitudinally at opposite ends of the recess 37, intermediate the chassis 31 and body 45, the hinges being in alignment with each other longitudinally of the chassis and body, and slightly offset from the longitudinal center line thereof toward one side of the chassis, as best seen in FIGS. 4 and 6. By this pivotal connection between body and chassis, the body is swingable from the solid line horizontal position toward one side of the chassis to the

phantom position declining toward said one chassis side. Also, the barrier 47 is simultaneously swingable with the body. Of course, the body 45 and barrier are swingable to return from the phantom position to the solid line position.

In the absence of load on the body 45, the body is normally urged to its horizontal position by the upper ends of springs 44 in resilient bearing engagement with the underside of the body at a position offset laterally from the pivotal axis of the body. The presence of a load on the body 45 further assures the maintenance of the body in its solid line horizontal or load-carrying position.

Interposed between the upper body 45 and the lower chassis 31, preferably in the receiver 37 is an electromagnet 60. The electromagnet 60 may be of a horseshoe or U-shaped configuration, disposed generally horizontally within the receptacle 37, having its bite region 61 adjacent to the housing 39, and its legs 62 extending laterally toward and terminating in the cutout 38 of the receptacle 37. The electromagnet 60 may include electric coils 63 on each leg 62, and the receptacle 37 may have its cutout 38 further cut out or notched at 64 beneath the space between the legs 62.

It will therefore be appreciated that the end regions of legs 62 define poles of the magnet 61, across which magnetic flux is developed upon energization of the electromagnet. The coils 63 may be connected by conductors 65 to pins or contacts 66 and 67 protruding respectively from lugs 41 and 42.

Fixedly secured to and depending from the underside of the body 45, as best seen in FIG. 3 and the solid line position of FIG. 4, is a highly magnetically permeable member or armature 69. More specifically, the armature, which may advantageously be an iron block, depends from the underside of body 45 partially into the interpole space between electromagnet legs 62. Upon swinging movement of the body 45 toward one side of the chassis 31, as to the phantom position in FIGS. 4, 6 and 7, the armature 69 is moved further into the interpole space between legs 62, to more completely occupy the space and cut more lines of magnetic flux. Hence, upon energization of the electromagnet 60, the armature 69 is caused to move downwardly to more fully occupy the interpole space, and this effects upward swinging movement of the body 45 to cause dumping or discharging of a load on the body, as by rolling or sliding across the downwardly swung barrier 47. Any such dumped load may be collected in the load receiver 25.

The support 24 is best seen in FIGS. 9-11, as including a housing 70 having an upstanding wall 71 facing toward a car 20 at the discharge station, and an inner upstanding wall 72 on the side of wall 71 remote from the car 20. The wall 71 is formed with a pair of horizontally extending, vertically spaced through openings or holes 73 being longitudinally coextensive and one over the other. In addition, a plurality of longitudinally extending, generally horizontal and lateral projecting ribs 74, 75 and 76 are formed on the wall 71, the lowermost rib 74 being immediately beneath the lower opening 73, the next upper rib 75 being immediately above the uppermost opening 73. In addition, the wall 71 is provided with inturned flanges or lugs 77 at opposite ends of each opening 73, which lugs project toward and terminate short of the inner wall 72. An upper, resilient conductor strip 78 is interposed between the upper rib 76 and intermediate rib 75, extending along the upper opening 73 and has its opposite end portions curled or bent, as at 79 loosely around respective lugs 77, the intermediate strip portion 80 extending outwardly through the upper opening 73. In this manner, the conductor strip 78 is resiliently and yieldably maintained in position.

A similar resilient conductor strip 81 extends between the intermediate rib 75 and lower rib 74, being located in the lower opening 73 and similarly yieldably held in position. Fixed interiorly of the support 24, as on the face of wall 72 are a pair of conductors 82, connected to respective conductors 28, for communication with a source of electric power. The strips 78 and 81 are engageable with respective conductors 82 upon depression of the resilient strips, as by contact pins 66 and 67.

That is, upon movement of the car 20 into position at the discharge station, the upper lug 40 on housing 39 effectively guides the car in proper position, riding on or above the upper rib 76 and serving to locate the upper contact 66 in bearing engagement with the upper conductor strip 78, and the lower contact pin 67 in bearing engagement with the lower conductor strip 81. In such bearing engagement, the conductor strips are maintained in contact with conductors 82, so that depression of switch button 27 closes the electromagnet 60 to a source of electrical power. As a relatively small electromagnet is desirable, and as momentary power is sufficient to operate the electromagnet, the switch 26 is advantageously of the momentary type.

From the foregoing, it is seen that the present invention provides a railroad dumping car assembly which fully accomplishes its intended objects and is well adapted to meet practical conditions of manufacture, distribution and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

What I claim is:

1. A model railroad freight dumping car comprising a chassis, wheeled running gear supporting said chassis for movement along a track, a body superposed on said chassis, pivot means along one side of said chassis mounting said body on said chassis for movement between a generally horizontal load-carrying position over said chassis and a dumping position swung about said pivot means upwardly toward one side of said chassis, electromagnetic means mounted on said chassis beneath said body and having a pair of pole faces located in spaced relation along said one side of said chassis, an armature carried by said body depending only partially into the interpole space when said body is in its load-carrying position, said armature being movable with said body upon swinging movement thereof toward its dumping position to increase the armature occupancy of the interpole space, whereby energization of said electromagnetic means with said body in its load-carrying position provides a substantial magnetic field path through said armature and urges said armature to occupy a maximum of said interpole space to effect swinging of said body to its dumping position.

2. A model railroad freight dumping car according to claim 1, in combination with a coil compression spring having opposite ends in bearing engagement with said chassis and body, respectively, to urge the latter toward its load-carrying position.

3. A model railroad freight dumping car according to claim 1, in combination with a barrier pivoted to said body adjacent to said one side of said chassis and swingable between an upstanding load retaining position when said body is in its load-carrying position and an outwardly and downwardly swung position when said body is in its dumping position, and cam means on said chassis engageable with said barrier to effect upward swinging thereof to its load-retaining position when said body swings to its load-carrying position.

4. A model railroad freight dumping car according to claim 1, said electromagnetic means comprising a generally U-shaped electromagnet fixed generally horizontally on said chassis with its legs extending laterally toward said one chassis side.

5. A model railroad freight dumping car according to claim 4, in combination with contacts on the other side of said chassis for electrical connection to a power supply, and conductors connecting said contacts directly to opposite ends of said electromagnet means.

6. A model railroad freight dumping car according to claim 5, in combination with an upstanding support for location along a track, a plurality of resilient conductor strips carried by said support for yieldable engagement with respective contacts, and conductor means for connecting said strips to a power supply.

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7. A model railroad freight dumping car according to claim 6, said support being provided with pairs of spaced slots, each of said conductor strips having spaced portions slidably

received in the slots of a respective pair with the strip portion intermediate said spaced portions extending toward the track for engagement with one of said contacts.

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