Sept. 18, 1956 E. M. BELL 2,763,382

TRAIN UNLOADER

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Fig. 1

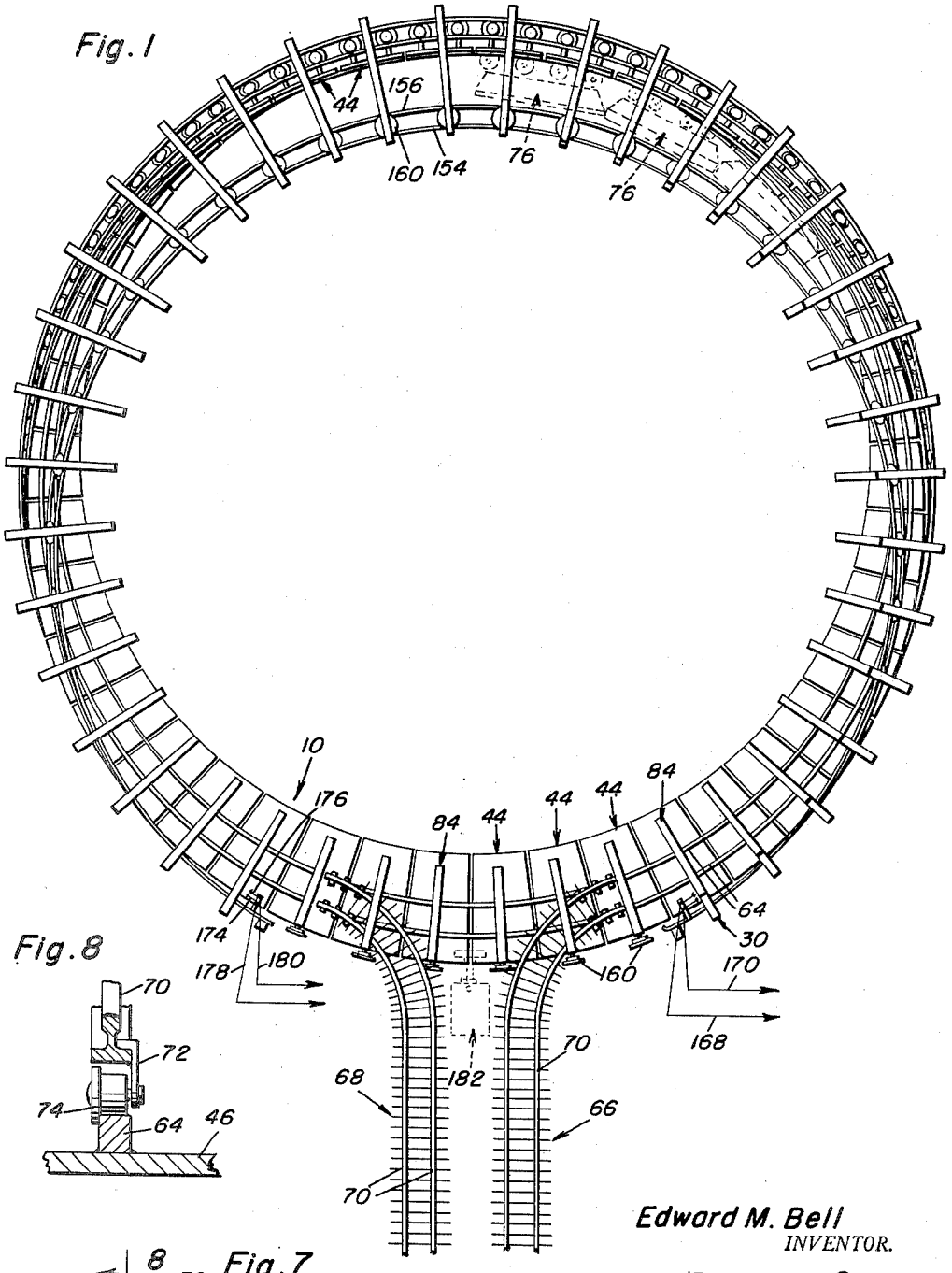
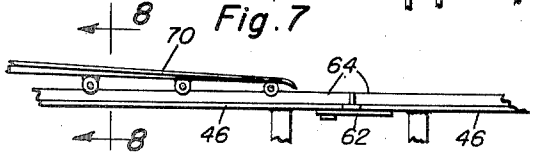


Fig. 8

Fig. 7



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TRAIN UNLOADER

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Fig. 2

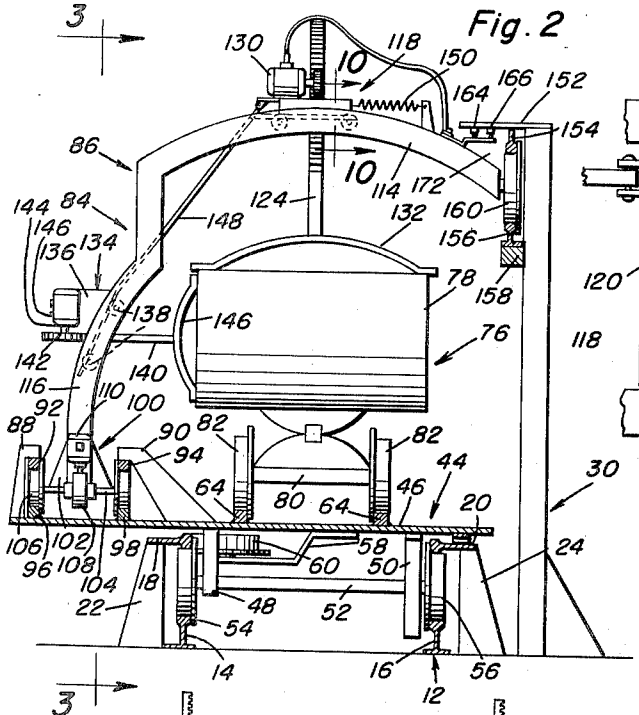


Fig. 9

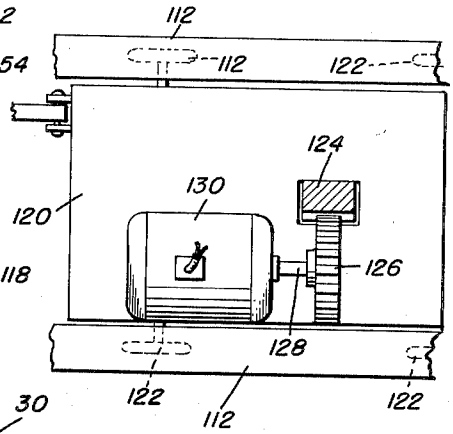
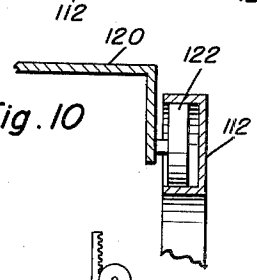


Fig. 10



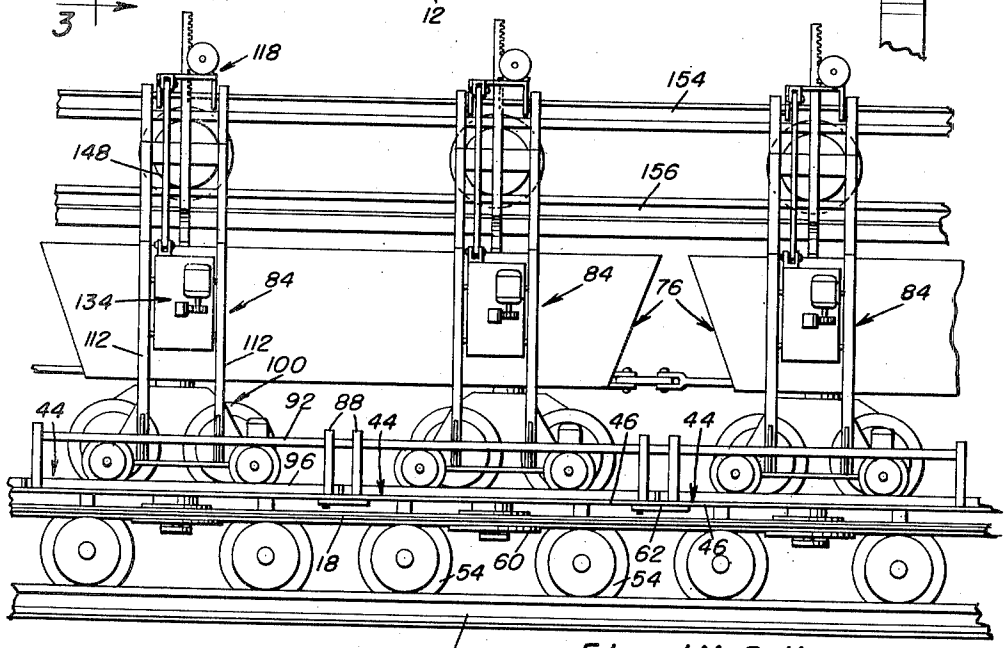


Fig. 3

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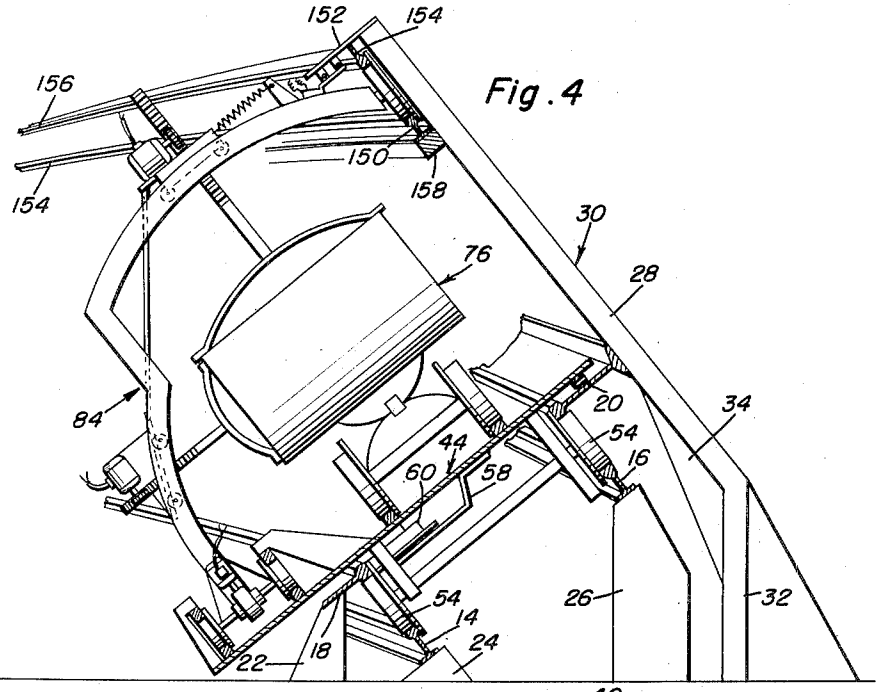


Fig. 4

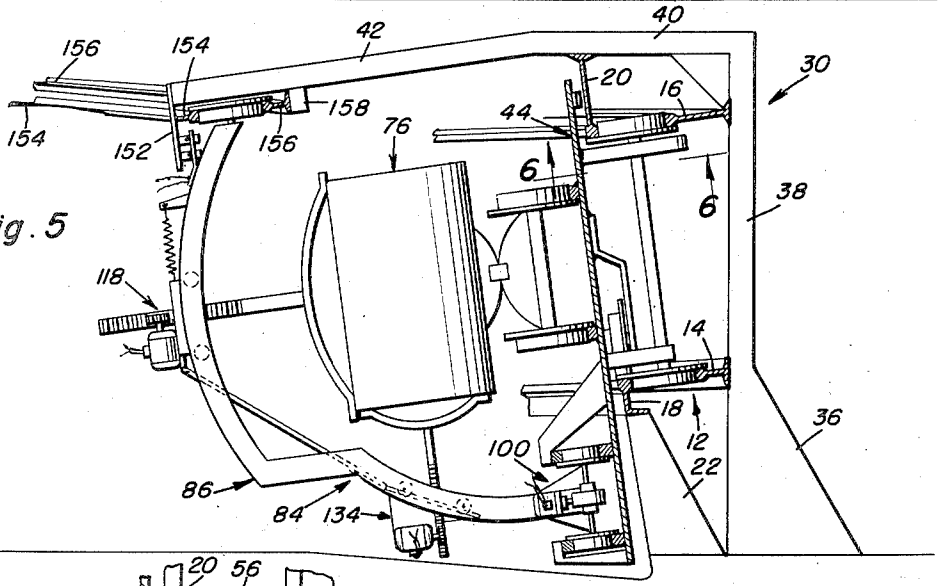


Fig. 5

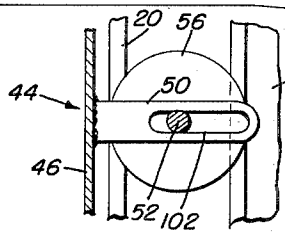


Fig. 6

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2,763,382

TRAIN UNLOADER

Edward M. Bell, Sidney, Tex.

Application August 18, 1955, Serial No. 529,090

11 Claims. (Cl. 214—62)

This invention relates in general to new and useful improvements in unloading mechanisms, and more specifically to an improved train unloader.

Although there have been devised many devices for dumping the contents of railroad cars, such dumping apparatus is normally limited in use to a minimum number of cars for it is so devised whereby the car is not properly supported for a complete dumping operation. It is therefore the primary object of this invention to provide an improved car dumping apparatus which is so constructed whereby cars may be pushed on the unloading apparatus and automatically completely dumped as they pass about the unloading apparatus with the unloading or dumping operation being substantially continuous.

Another object of this invention is to provide an improved train unloader which includes a plurality of flat bed cars having rail sections mounted thereon for receiving railroad cars to be dumped, the flat bed cars being arranged in a continuous loop and being adapted to receive an entire train with the train passing onto the flat bed cars, being dumped by a tilting movement of the flat bed cars and then moving thereoff, the flat bed cars being primarily motivated by the engine for the train being unloaded.

Another object of this invention is to provide an improved train unloader which is in the form of a plurality of flat bed cars for carrying individual train cars to be dumped, the flat bed cars being provided with means for clamping the cars to be unloaded thereto in order that the cars to be unloaded may be completely dumped without being provided with any special mechanisms.

A further object of this invention is to provide an improved clamping mechanism for clamping dump cars to be dumped to flat bed cars, the clamping mechanism being of such a nature whereby it is automatically set after a car has been positioned on a flat bed car and is automatically released immediately prior to the removal of the railway car from the flat bed car.

Still a further object of this invention is to provide an improved track arrangement whereby there is provided a lead track and a return track of a railway which is so arranged with respect to rail sections carried by flat bed cars whereby railway cars to be dumped may be continuously pushed upon the flat bed cars and moved about with the flat bed cars and returned from the flat bed cars on the return track.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a top plan view of the train unloader which is the subject of this invention and shows the general arrangement of the components thereof, railway cars to be dumped being shown in dotted lines in their dumping position;

Figure 2 is an enlarged transverse vertical sectional view taken through a flat portion of the train unloader and shows the arrangement of the endless track of the train unloader, one of the flat bed cars thereof, clamping means carried by the flat bed car, a dump car to be dumped mounted on the flat bed car and auxiliary support rails for the clamp means;

Figure 3 is a fragmentary elevational view taken substantially upon the plane indicated by the section line 3—3 of Figure 2 and shows the specific details of several of the flat bed cars and the clamp means carried thereby and the relationship between the clamp means and railway cars to be dumped;

Figure 4 is a transverse vertical sectional view on an enlarged scale taken through a portion of the train unloader wherein a car to be dumped is in an initial tilted position and shows the details of the various features of the train unloader;

Figure 5 is an enlarged vertical sectional view similar to Figures 2 and 4 and shows the railway car in its full dump position;

Figure 6 is an enlarged fragmentary transverse sectional view taken substantially upon the plane indicated by the section line 6—6 of Figure 5 and shows the mounting for the outer end of an axle of one of the flat bed cars;

Figure 7 is an enlarged fragmentary side elevational view of one of the rails of the lead track and shows the relationship thereof with respect to one of the rail sections carried by one of the flat bed cars;

Figure 8 is an enlarged fragmentary transverse vertical sectional view taken substantially upon the plane indicated by section line 8—8 of Figure 7 and shows the specific details of a wheel or roller carried by the lead track rail for riding engagement on one of the rail sections of the flat bed car;

Figure 9 is an enlarged fragmentary horizontal sectional view taken through the upper part of the clamp means and shows the general details of the means for actuating the clamp means; and

Figure 10 is an enlarged fragmentary vertical sectional view taken substantially upon the plane indicated by section line 10—10 of Figure 2 and shows the manner in which a carriage for a portion of the clamp means is adjustably carried by a part of one of the support arms.

Referring now to the drawings in detail, it will be seen that the train unloader, which is the subject of this invention, is best illustrated in Figure 1. The train unloader is referred to in general by the reference numeral 10 and includes a circular track which is referred to in general by the reference numeral 12.

As is best illustrated in Figure 2, the circular track 12 includes a pair of lower rails 14 and 16 which are initially vertically disposed, and a pair of normally horizontal rails 18 and 20 which are carried in vertical spaced relation with respect to the rails 14 and 16, respectively, by standards 22 and 24.

In order that a dumping operation may be permitted, the endless track 12 is twisted in the central portion thereof, as is best illustrated in Figure 1. Accordingly, adjacent the beginning of the twisted portion of the endless track 12, the rail 14 is mounted on a relatively shallow standard 24. A relatively higher standard 26 is provided for the rail 16. At the same time, the standard 22 is changed in shape so as to position the rail 18 in the same relation to the rail 14. The rail 20 is increased in size and carried by a sloping portion 28 of a column which is referred to in general by reference numeral 30, the column 30 having a vertical wall portion 32 and the sloping portion 28 being braced thereto by means of a gusset 34.

Referring now to Figure 5 in particular, it will be seen that the endless track 12 has been twisted or tilted so that the arrangement of the rails 14 and 16 is such that the

rails have been rotated to an angle in excess of 90° from their positions of Figure 2. The column **30** has now been shaped so as to include a base **36**, a vertical portion **38**, a horizontal portion **40** and an inwardly and downwardly sloping portion **42**. The rail **14** is carried by the vertical portion **38** at its intersection with the base **36**. The rail **16** is carried by the upper part of the vertical portion **38**. The rail **18** is still carried by the support or standard **22** which is now disposed closely adjacent the base **36**. Further, the rail **20** is carried in depending relation by the horizontal portion **40** of the column or standard **30**.

From the foregoing description of the mounting of the rails **14**, **16**, **18** and **20**, it will be readily apparent that a car passing along these rails will move from a horizontal position to a gradually tilted inwardly directed position, then to a position disposed at more than 90° to the horizontal, then the car will be reversely tilted, and finally returned to its normal horizontal position.

Carried by the endless track **12** is an endless series of flat bed cars, each of the flat bed cars being referred to in general by the reference numeral **44**. Each flat bed car **44** includes a flat bed **46** which extends inwardly past the inner rails **14** and **18** of the endless track **12**. Supporting the bed **46** by means of suitable hangers **48** and **50**, as well as axles **52** are flanged wheels **54** and **56**. The wheels **54** are disposed on the inner side of the endless track **12** and engage the rails **14** and **18**. The wheels **56** engage the rails **16** and **20**.

Carried by the flat bed **46** of each flat bed car **44** intermediate the ends thereof is a horizontally disposed hanger **58** which carries a horizontally disposed flanged wheel **60**. The flanged wheel **60** engages the rail **18** at right angles to the wheel **54**.

In the normal position of the flat bed car **44**, the wheels **54** and **56** engage the rails **14** and **16** in a normal manner. However, as the flat bed cars **44** are tilted in their movement about the endless track **12**, there is a tendency for the wheels **54** and **56** to move upwardly into engagement with the rails **18** and **20**. At the same time, the wheel **60** moves down into engagement with the rail **18** and helps to support the flat bed car **44** on the endless track **12**.

As is best illustrated in Figure 3, the flat beds **46** of the flat bed cars **44** are disposed in end-to-end relation and connected together by a suitable pivotally mounted coupler **62**. Further, carried by the upper surfaces of the upper surfaces of the flat beds **46** are rail sections **64**, the rail sections **64** having a gauge equal to the gauge of the railway cars which are to be dumped.

Referring now once again to Figure 1 in particular, it will be seen that leading into the train unloader **10** is a lead track which is referred to in general by the reference numeral **66**. Also, leading off the train unloader **10** is a return track, which is referred to in general by the reference numeral **68**. The tracks **66** and **68** are of conventional gauge and construction for the railroad cars which are intended to be unloaded or dumped by the train unloader **10**. The tracks **66** and **68** include rails **70** which are of the same gauge as the rail sections **64**.

As is best illustrated in Figures 7 and 8, the rails **70** of the track **66** slope downwardly in overlying relation to the rail sections **64**. Carried by the base of each rail **70** is a plurality of hangers **72** carrying rollers or wheels **74**. The wheels **74** ride upon the track section **64** and support the free ends of the rails **70** with respect to the rail sections **64**. Thus, when the flat bed cars **44** move about the endless track **12**, the track sections **64** will move under the rails **70** and support the rails **70** in positions for leading railway cars onto the track sections **64**. The rails **70** of the return track **68** are mounted in the same relation with respect to the track sections **64**, with the exception that the free ends thereof are disposed immediately adjacent the upper surfaces of the track sections **64** in order that railway cars may ride up onto the return track **68** from the flat bed cars **44**.

Referring now to Figure 2 in particular, it will be seen that there is illustrated a conventional type of dump car whose contents are to be dumped by the train unloader **10**, the dump car being referred to in general by the reference numeral **76**. The dump car **76** includes a dump type body **78** supported by axles **80** and wheels **82**. When mounted on the flat bed cars **44**, the wheels **82** engage the rail sections **64**.

In order that the dump cars **76** may be retained on the flat bed bars **64** during a dumping operation, there are provided clamp means which are referred to in general by the reference numeral **84**.

The clamp means **84** includes a cantilever arm which is referred to in general by the reference numeral **86**.

Extending upwardly from that portion of the flat bed **46** disposed inwardly of the endless track **12** are inner supports **88** and outer supports **90**. Carried by the supports **88** and **90** are rails **92** and **94**. The rails **92** and **94** overlie rails **96** and **98**, respectively, carried by the flat bed **46**.

The lower part of each arm **86** includes a carriage which is referred to in general by the reference numeral **100**. Each carriage **100** includes a frame **102** carrying axles **104**. Mounted on the ends of the axles **104** are wheels **106** which engage the rails **92** and **96**, and **94** and **100**, respectively. At least one axle **104** of each carriage **100** includes a differential **108** which is driven by an electric motor **110**. In this manner, the clamp means **84** may be adjusted along the flat bed cars **44**.

Each arm **86** is formed in halves with each of the halves being of a channel-shaped cross-section and facing each other, the halves being referred to by the reference numeral **112** as best illustrated in Figures 9 and 10. The arm **86** includes an upper arcuate generally horizontal portion **114** and a lower arcuate, generally vertical portion **116**. Engaged with the halves **112** of the arcuate portion **114** is a carriage which is referred to in general by the reference numeral **118**. The carriage **118** includes a body **120** supported by suitable wheels **122** engaging the halves **112**.

Guidingly mounted on the body **120** and extending therethrough is a vertically disposed rack **124**. The rack **124** is engaged by a gear **126** carried by an armature shaft **128** of an electric motor **130**. The electric motor **130** is mounted on the upper side of the body **120**. Carried by the lower end of the rack **124** is a normally horizontal clamp member **132**. As is best illustrated in Figure 3, each of the flat bed cars **44** is provided with one of the clamp means **84**, and accordingly, each clamp member **132** is arranged so as to clamp an end portion of a dump car **76**.

Carried by the generally vertical portion **116** of each arm **86** is a carriage which is referred to in general by the reference numeral **134**. The carriage **134** includes a body which is supported relative to the halves **112** of the arm **86** by wheels **138** in the same manner as is the body **120**.

Extending horizontally through the body **136** and guided relative thereto is an elongated rack **140**. Engaged with the rack **140** is a gear **142** carried by an armature shaft **144** of an electric motor **146**. Carried by the inner end of the rack **140** is a vertical stop member **146** which is intended to engage the inner side of the dump car **76**.

In order that the clamp members **132** and the stop member **146** may be automatically centered with respect to one of the dump cars **76**, the carriages **118** and **134** are connected together by a link **148**. Further, the carriage **118** is urged to the right of its position illustrated in Figure 2 by a spring member **150** which is anchored relative to the arm **86**.

Referring once again to Figure 2 in particular, it will be seen that in the horizontal position of the endless

track 12, the standard 30 is directly upright. Extending inwardly from the upper end of the standard 30 is a plate 152. Depending from the plate 152 is an upper rail 154 which is disposed in vertical spaced relation to a lower rail 156 carried by a mounting block 158.

Referring now to Figure 4 in particular, it will be seen that the plate 152 is still mounted on the upper end of the standard 30, but on the sloping portion 28 thereof. Also, the rail 156 is mounted on the sloping portion 28 by means of the block 158. In Figure 5, due to the twisting of the entire train unloader 10, the plate 152 is carried by the lower end of the downwardly and inwardly sloping portion 42, and the rail 154 is now in a generally horizontal position. The rail 156 is in a similar position and is supported by the block 158 with the block 158 depending from the portion 42 of the standard 30.

Carried by the inner and upper end of each of the arms 86 is a wheel 160. The wheel 160 engages the rails 154 and 156 and serves to help support the dump car 76 during the dumping operation thereof. In order that the wheels 160 may take a portion of the load of the dump car 76, the bracket 50 of each flat bed car 44 is provided with an elongated slot 162 through which the axle 52 passes, as is best illustrated in Figure 6. This permits a slight shifting of the flat bed 46 with respect to the axles 52 and the wheels 56 which are maintained in fixed positions by the rails 16 and 20.

Carried by certain of the plates 152 immediately adjacent the connection of the lead track 66 with the flat bed cars 44 are overhead wires 164 and 166 which have connected thereto wires 168 and 170, respectively. Carried by each arm 86 is a pick-up contact assembly 172 which is engageable with the wires 164 and 166.

Accordingly, as a dump car 76 is urged onto one of the flat bed cars 44 and the dump car 76 and the flat bed cars on which it is mounted move about the endless track 12, the contact 172 will engage the wires 164 and 166 to energize electric motors 130 and 146. This will result in the moving of the clamp member 132 and the stop member 146 into the railway car retaining positions illustrated in Figure 2. While it has not been specifically illustrated, it is to be understood that the electric motors 130 and 146 will be provided with suitable clutch mechanisms so as to limit the pressure applied on the railway car 76.

From the foregoing description of the clamp means 84, it will be readily apparent that each dump car 76 will be retained in its proper position on the flat bed cars 44 in the movement of the flat bed cars 44 about the endless track 12 so that the contents of the dump cars 76 may be dumped into a pit or the like (not shown) at the maximum tilting position of the train unloader 10.

Referring once again to Figure 1 in particular, it will be seen that carried by one of the plates 152 adjacent the beginning of the return track 68 are overhead wires 174 and 176 to which are connected wires 178 and 180. As the flat bed cars 44 move into alignment with the ends of the return track 68, the pick-up contact assembly 172 will engage the wires 174 and 176. The wires 174 and 176 will then energize the electric motors 130 and 146 so as to drive them in opposite directions from that previously described. This will result in the automatic releasing of the dump car 76.

From the foregoing description of the train unloader 10, it will be readily apparent that once the individual clamp means 84 are properly adjusted on the flat bed cars 44 for clamping the dump cars to be dumped, an entire train may be run upon the train unloader 10 and dumped in a continuous operation. In the dumping operation of a train, the caboose of the train will be removed and the rear car slowly pushed upon one or more of the flat bed cars 44, depending upon the length of the car to be dumped. The brakes of the car will be momentarily set so that the endless cars 44 will move about the endless track 12. As this rear car 76 passes along the endless

track 12 on the flat bed cars 44, those clamp means 84 overlying the car 76 will be energized so as to effectively position the rear car on the plurality of flat bed cars 44. The brakes on this rear car 76 may then be released. The cars of the train are continuously backed onto the flat bed cars 44 with each of the cars 76 being progressively clamped by the clamp means 84 in the manner described above. This operation is continued until the rearmost car is backed entirely around the train unloader 10, during which time the contents thereof are dumped, and it is released from the clamp means 84 and returned upon the return track 68. At this time the engine (not shown) of the train may be disconnected from the remaining cars and run around to the return track 68 where it will be then coupled with the endmost dump car 76. The train may then be pulled about the train unloader 10 with the individual cars thereof being progressively dumped.

It is to be understood that the train unloader 10 is primarily intended for use in dumping full size gondola cars of a train. However, the size of the train unloader 10 may be varied depending upon the particular type of dump car to be dumped.

In the event the train to be dumped is limited to a relatively few number of cars insufficient to completely fill the train unloader 10 whereby they may be pushed around by an engine located either on the lead track 66 or the return track 68, the flat bed cars 44 may be moved about the endless track 12 by means of motor power in the form of a power source 182 which is suitably coupled to the flat bed cars 44. The connection between the power source 182 and the flat bed cars 44 may be in the form of a gear on the power source 182 and a rack on the undersides of the flat beds 46.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A train unloader comprising an endless track, said track having a gradually transversely tilted portion, an endless series of flat bed cars disposed on said endless track for movement thereon, track sections mounted on said cars for movement therewith, said track sections being arranged in an endless relation, a lead track communicated with said track section, a return track communicated with said track sections, and clamp means carried by said cars for clamping dump cars to said flat bed cars.

2. A train unloader comprising an endless track, said track having a gradually transversely tilted portion, an endless series of flat bed cars disposed on said endless track for movement thereon, track sections mounted on said cars for movement therewith, said track sections being arranged in an endless relation, a lead track communicated with said track sections, a return track communicated with said track sections, and clamp means carried by said cars for clamping dump cars to said flat bed cars, said lead and return tracks being continuously engaged with said track sections whereby said flat bed cars may be moved about said endless track by being pushed by a long train of dump cars on said flat bed cars.

3. A train unloader comprising an endless track, said track having a gradually transversely tilted portion, an endless series of flat bed cars disposed on said endless track for movement thereon, track sections mounted on said cars for movement therewith, said track sections being arranged in an endless relation, a lead track communicated with said track sections, a return track communicated with said track sections, and clamp means carried by said cars for clamping dump cars to said flat bed

cars, means for automatically actuating said clamp means adjacent said lead track, and means for automatically releasing said clamp means adjacent said return track.

4. A train unloader comprising an endless track, said track having a gradually transversely tilted portion, an endless series of flat bed cars disposed on said endless track for movement thereon, track sections mounted on said cars for movement therewith, said track sections being arranged in an endless relation, a lead track communicated with said track sections, a return track communicated with said track sections, and clamp means carried by said cars for clamping dump cars to said flat bed cars, said clamp means including an arm carried by certain of said flat bed cars in overlying relation to said track sections, a vertically adjustable clamp member carried by each of said arms for engagement with an upper part of a dump car.

5. A train unloader comprising an endless track, said track having a gradually transversely tilted portion, an endless series of flat bed cars disposed on said endless track for movement thereon, track sections mounted on said cars for movement therewith, said track sections being arranged in an endless relation, a lead track communicated with said track sections, a return track communicated with said track sections, and clamp means carried by said cars for clamping dump cars to said flat bed cars, said clamp means including an arm carried by certain of said flat bed cars in overlying relation to said track sections, a vertically adjustable clamp member carried by each of said arms for engagement with an upper part of a dump car, self-centering means carried by said arms for aligning said clamp member with a dump car.

6. A train unloader comprising an endless track, said track having a gradually transversely tilted portion, an endless series of flat bed cars disposed on said endless track for movement thereon, track sections mounted on said cars for movement therewith, said track sections being arranged in an endless relation, a lead track communicated with said track sections, a return track communicated with said track sections, and clamp means carried by said cars for clamping dump cars to said flat bed cars, said clamp means including an arm carried by certain of said flat bed cars in overlying relation to said track sections, a vertically adjustable clamp member carried by each of said arms for engagement with an upper part of a dump car, a horizontally adjustable stop member carried by said arm for engagement with a side of a dump car for supporting a dump car in a tilted dumping position.

7. A train unloader comprising an endless track, said track having a gradually transversely tilted portion, an endless series of flat bed cars disposed on said endless track for movement thereon, track sections mounted on said cars for movement therewith, said track sections being arranged in an endless relation, a lead track communicated with said track sections, a return track communicated with said track sections, and clamp means carried by said cars for clamping dump cars to said flat bed cars, said clamp means including an arm carried by certain of said flat bed cars in overlying relation to said track sections, a vertically adjustable clamp member carried by each of said arms for engagement with an upper part of a dump car, a horizontally adjustable stop member carried by said arm for engagement with a side of a dump car for supporting a dump car in a tilted dumping position, said clamp member and said stop member being mounted on carriages adjustably mounted on said arm.

8. A train unloader comprising an endless track, said track having a gradually transversely tilted portion, an endless series of flat bed cars disposed on said endless track for movement thereon, track sections mounted on said cars for movement therewith, said track sections being arranged in an endless relation, a lead track communicated with said track sections, a return track communicated with said track sections, and clamp means carried by said cars for clamping dump cars to said flat bed cars, said clamp means including an arm carried by certain of said flat bed cars in overlying relation to said track sections, a vertically adjustable clamp member carried by each of said arms for engagement with an upper part of a dump car, a horizontally adjustable stop member carried by said arm for engagement with a side of a dump car for supporting a dump car in a tilted dumping position, said clamp member and said stop member being mounted on carriages adjustably mounted on said arm, means interconnecting said carriages, and self-centering means between said carriages and said arm for aligning said clamp member and said stop member with a dump car.

9. A train unloader comprising an endless track, said track having a gradually transversely tilted portion, an endless series of flat bed cars disposed on said endless track for movement thereon, track sections mounted on said cars for movement therewith, said track sections being arranged in an endless relation, a lead track communicated with said track sections, a return track communicated with said track sections, and clamp means carried by said cars for clamping dump cars to said flat bed cars, said clamp means including an arm carried by certain of said flat bed cars in overlying relation to said track sections, a vertically adjustable clamp member carried by each of said arms for engagement with an upper part of a dump car, said arm having an end remote from said flat bed cars provided with a wheel, an elevated rail assembly, said wheel engaging said elevated rail assembly for supporting said arm and said flat bed cars in tilted positions.

10. A train unloader comprising an endless track, said track having a gradually transversely tilted portion, an endless series of flat bed cars disposed on said endless track for movement thereon, track sections mounted on said cars for movement therewith, said track sections being arranged in an endless relation, a lead track communicated with said track sections, a return track communicated with said track sections, and clamp means carried by said cars for clamping dump cars to said flat bed cars, said clamp means including an arm carried by certain of said flat bed cars in overlying relation to said track sections, a vertically adjustable clamp member carried by each of said arms for engagement with an upper part of a dump car, means for automatically actuating said clamp means adjacent said lead track, and means for automatically releasing said clamp means adjacent said return track.

11. A train unloader comprising an endless track, said track having a gradually transversely tilted portion, an endless series of flat bed cars disposed on said endless track for movement thereon, track sections mounted on said cars for movement therewith, said track sections being arranged in an endless relation, a lead track communicated with said track sections, a return track communicated with said track sections, and clamp means carried by said cars for clamping dump cars to said flat bed cars, said lead and return tracks being provided with supporting wheels continuously engaged with said track sections whereby said flat bed cars may be moved about said endless track by being pushed by a long train of dump cars on said flat bed cars.

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