T. W. GUTHRIE.

METHOD OF AND APPARATUS FOR UNLOADING CARS.

APPLICATION FILED MAY 9, 1917.

1,272,425.

Patented July 16, 1918.

2 SHEETS—SHEET 1.

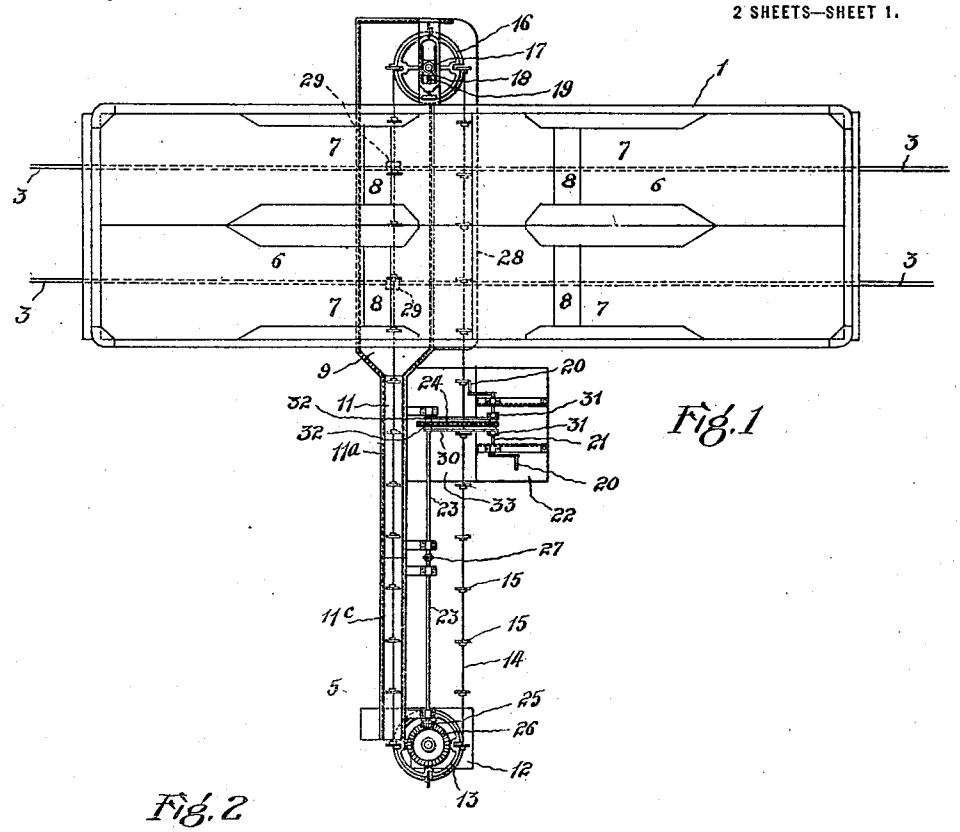

Fig. 1

Fig. 2

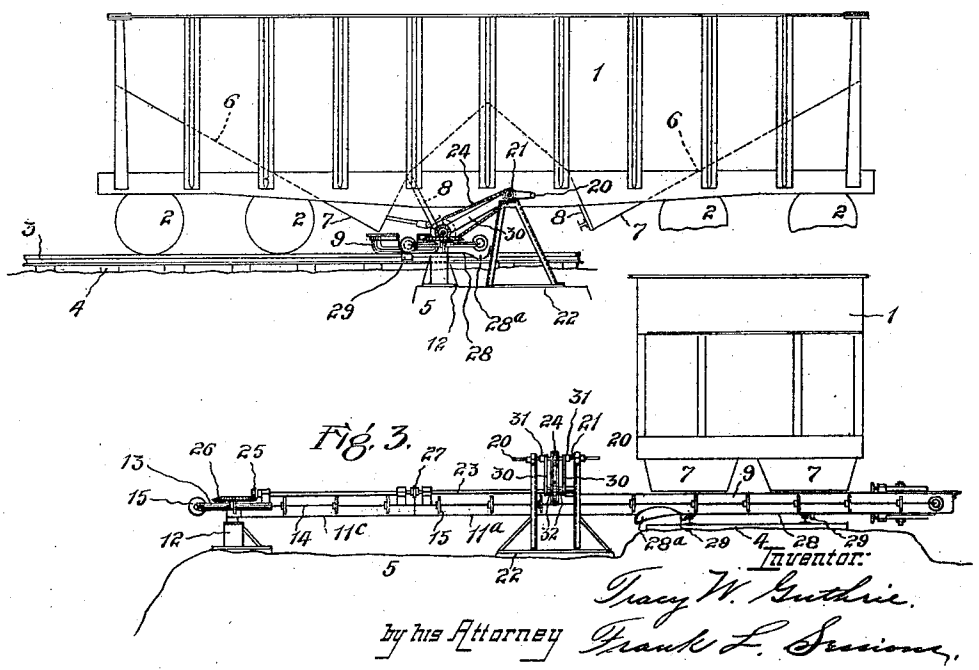

Fig. 3.

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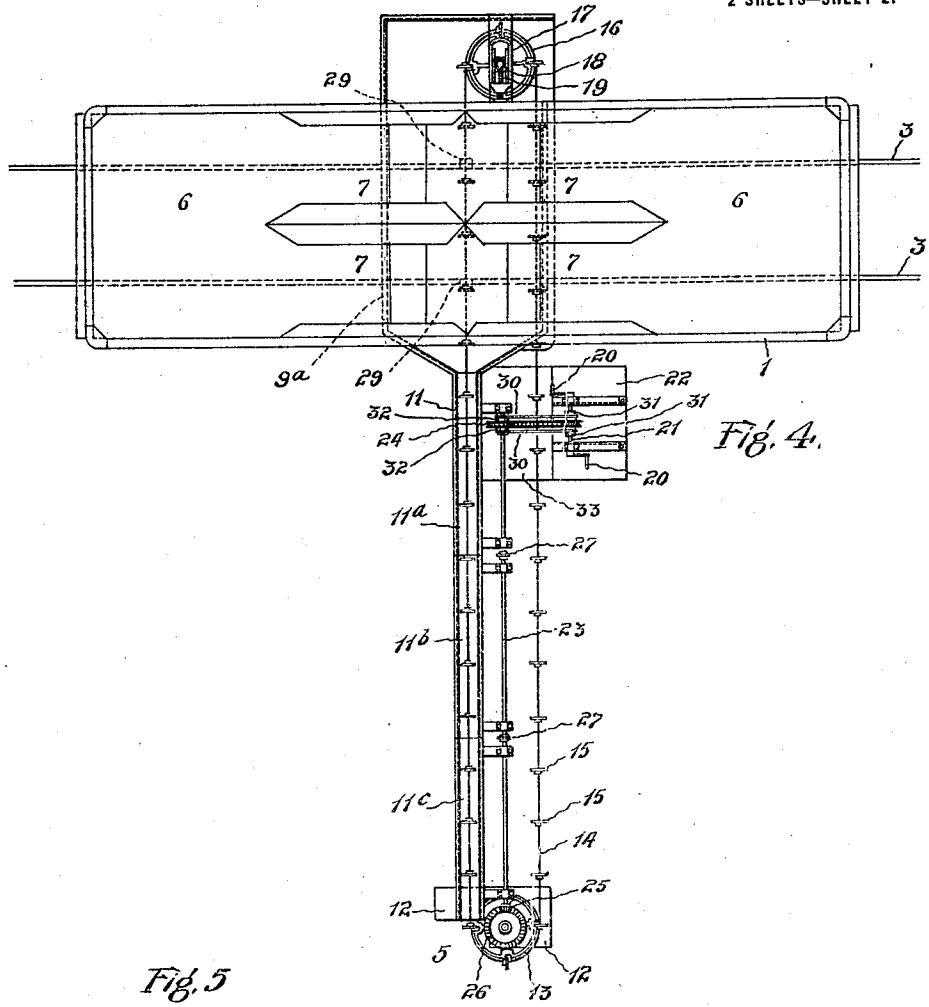
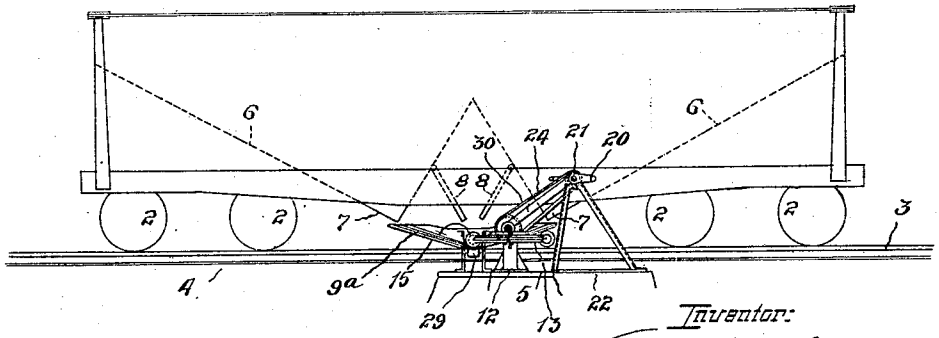


Fig. 4.

Fig. 5



Inventor:

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UNITED STATES PATENT OFFICE.

TRACY W. GUTHRIE, OF SEWICKLEY, PENNSYLVANIA.

METHOD OF AND APPARATUS FOR UNLOADING CARS.

1,272,425. Specification of Letters Patent. **Patented July 16, 1918.**

Application filed May 9, 1917. Serial No. 167,471.

To all whom it may concern:

Be it known that I, TRACY W. GUTHRIE, a citizen of the United States, residing at Sewickley, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Methods of and Apparatus for Unloading Cars, of which the following is a specification.

My invention is particularly adapted to unloading bottom dump cars and discharging the material at some distance from the tracks on which the car being unloaded is standing.

One of the principal objects of my invention is to provide a method and means whereby bottom dump cars can be quickly and cheaply unloaded at any place and not have to be set over a pit or brought to a particular place for unloading.

Another object of my invention is to provide a conveyer adapted to be placed above the track rails, under the discharge opening or openings of bottom dump railway cars and convey away the material which falls from the car upon the conveyer receiving hopper.

Another object of my invention is to provide a light, portable unloading apparatus which can be moved from car to car or from place to place by man power alone.

Another object of my invention is to provide a sectional conveyer which can readily be lengthened or shortened to carry the material to any desired point and discharge it at that point. This feature is advantageous where the material has to be discharged over an embankment to make a fill, as the conveyer can be readily extended to discharge farther from the car as the fill is made.

I am aware that various means have been employed for taking the material away from bottom dump cars, but in all those with which I am familiar, the material from the car being unloaded is first discharged into a permanent pit, bin or hopper beneath the rails on which the car is standing, and from this receptacle it is taken by various means.

Or, the material in the cars may be dumped through an open trestle upon the ground below. When it has been necessary to unload bottom dump cars at places away from a prepared pit or trestle a great deal of manual labor and time has been consumed in shoveling the material out of the cars upon the ground and again shoveling it away from the tracks.

By my invention, the material is discharged from the car upon a portable platform, shallow hopper or receptacle which is placed upon the rails of the track on which the car stands, directly under the discharge spout of the car. For carrying away the material, I provide a conveyer which is preferably made in sections in order that its length may be made such that the material may be discharged at any convenient distance from the car, and, further in order to make the weight of the several parts of the apparatus small enough to be readily moved about by a few men. The conveyer is preferably arranged to be driven by man power, although it will be apparent that any convenient power device such as a pressure fluid engine or an electric motor may be employed.

My improved method of unloading cars and the apparatus I prefer to employ in carrying out my method is clearly described in these specifications and shown in the accompanying dawings, in which Figure 1 is a plan view of a bottom dump car with a conveyer arranged underneath the car and above the track rails to receive and carry away the material from the discharge door or doors through which the materials from one end of the car are discharged;

Fig. 2 is a side elevation of the car and conveyer shown in Fig. 1;

Fig. 3 is an end view of the car and conveyer shown in Figs. 1 and 2, the car wheels and truck being removed to show the location and arrangement of the conveyer upon the track rails;

Fig. 4 is a plan view of a car similar to that shown in Figs. 1, 2 and 3 with a conveyer adapted to receive the material from the discharge doors at both ends of the car at the same time;

Fig. 5 is a side elevation of the car and conveyer shown in Fig. 4.

In the drawings, 1 represents the body of the bottom dump car, conventionally shown; 2, 2, are the car wheels; 3, 3, are the track rails; 4 is the road bed; and 5 is the embankment at the side of the road bed.

The inclined hopper bottom of the car is shown at 6, 6, terminating in the discharge spouts, 7, 7, which are provided with discharge doors, 8, 8.

It will be understood that any convenient known means may be employed for opening and closing the discharge doors, 8, as the particular construction of the car is immaterial to my invention.

Beneath the car but above the rails, preferably supported by the rails, I place the receiving hopper 9, of the conveyer, 10. In Figs. 1, 2, and 3, the receiving hopper, 9, is shown arranged to receive the material discharged from only one end of the car, while in Figs. 4 and 5, I show a receiving hopper, 9a, adapted to receive material discharged from both ends of the car at the same time if desired.

To one end of the receiving hopper, 9, or 9a, is secured a conveyer trough, 11. This trough may advantageously be made in sectional lengths, 11a, 11b, 11c, so that the discharge end of the trough may be located at any desirable distance away from the car and thus the material from the car be discharged over the edge of the embankment without making it necessary to lay new tracks on which to run the cars as the embankment is filled in away from the tracks.

The outer end of the conveyer trough, 11, has secured to it a plate or frame, 12, upon which there is mounted in suitable bearings the revolving drive sprocket wheel or sheave, 13, around which traverses the flexible rope, 14, upon which are secured the conveyer flights, 15, 15.

The flexible rope, 14, is preferably made in sections of the same length or of double the length of the sections, 11a, 11b, etc., of the conveyer trough, so that the length of the rope may be readily adapted to any length of conveyer that may be required for carrying the material away from the car.

At the rear end of the receiving hopper, 9 or 9a, there is mounted on adjustable bearings, a sprocket, 16, around which the slack side of conveyer rope, 14, passes. The frame, 17, which carries the adjustable bearings, 18, of the sprocket or sheave wheel, 16, is secured to or in fixed relation to the hopper, 9 or 9a. The adjustment of the bearings, 18, is effected by screws, 19, which are threaded through the frame, 17, and abut against bearings, 18. This adjustment is provided in order that the stretch of the rope may be taken up, and further in order to provide for variations and inaccuracies in the lengths of the sectional conveyer trough and conveyer rope.

For driving the conveyer, I have shown a pair of hand cranks, 20, 20, mounted upon a shaft, 21, having bearings upon a platform, 22. Motion from crank shaft, 21, is transmitted to a transmission shaft, 23, by means of a sprocket and chain drive, 24. Motion from shaft, 23, is transmitted to drive wheel, 13, through bevel pinion, 25, which meshes with a large bevel gear, 26, which is formed integral with or secured to sprocket, 13. Shaft, 23, is preferably made in sections, each section being supported in bearings secured to one of the conveyer trough sections. 27, 27, are flange couplings for connecting the shaft sections together. The sectional lengths of rope, 14, may be joined by splice blocks or by the flights, 15, in a well known manner.

In order to guide the slack side of the conveyer rope and flights over the track rails, I provide a metal apron, 28, which has a depressed end, 28a, adapted to receive and lift the oncoming flights of the slack side of the rope and guide them over the rails to the rear sprocket wheel or sheave, 16.

To prevent shifting of the receiving hopper, I provide blocks, 29, 29, secured to the underside of the hopper and adapted to engage the track rails as shown in dotted lines in Figs. 1 and 4, and in full lines in Figs. 2, 3 and 5. These blocks may be arranged between the rails or outside of the rails. If desired, blocks may be placed both between the rails and outside of the rails and means, such, for instance, as set screws, may be provided for anchoring the receiving hopper securely to the rails.

For alining crank shaft, 21, with the transmission shaft, 23, and for resisting the pull of the chain between them, I provide a frame, 30, which has bearings, 31, 31, on both sides of the driver sprocket on shaft, 21, extends between shafts, 21 and 23, and has bearings, 32, 32, on both sides of the driven sprocket on shaft, 23. The bearings, 31 and 32, are preferably provided with removable caps, so that the frame, 30, may be readily disconnected from the shafts, 21 and 23, when the apparatus is to be moved. In addition to the frame, 30, I provide also a connecting plate or brace, 33, which is detachably secured to the platform, 22, and to the conveyer trough, 11, or hopper, 9, for further alining and holding shafts, 21 and 23, in proper working relation.

It will be observed that the hopper is shallow to allow of its being inserted beneath the low-down dump cars of the type illustrated. Owing to the shallowness of the hopper and the limited vertical space, the flights of the endless conveying element extend approximately the full depth of the hopper and are arranged to travel around vertical axes, so that the working leg thereof will travel upon, and preferably central of the closed bottom of the hopper, and with its returning leg approximately in the same horizontal plane on the outside of the hopper. In conveyers generally, the feed hoppers are constructed above the conveyer belts, and the working legs of the belts practically form the bottoms of the hoppers; but in my construction, owing to the limited space, and further, for the purpose of

reducing the force required to draw the conveying element through the material discharged from the car, the conveyer is constructed considerably narrower than the hopper, while the hopper is made wide to properly receive and to hold a sufficient quantity of material to supply a full, constant feed to the flights. The wide hopper also prevents the overflowing of the material onto the road-bed between the track rails.

The placing and operation of my unloading apparatus is as follows: The car being stationary on the track rails, the receiving hopper portion of the apparatus is shoved under the bottom of the car and properly located with reference to the discharge door or doors from which the material is to be removed. The proper number of conveyer sections are connected to the discharge end of the receiving hopper, the first one being joined to the receiving hopper and the others securely joined together by any suitable joining means. The outer section of the conveyer will be the one which has secured to it the plate upon which is mounted the conveyer drive sprocket. The frame carrying the crank shaft will be anchored at its proper position adjacent to the conveyer. The shaft, 23, will have its sections properly coupled together, the sprocket and chain drive between the crank shaft and shaft, 23, will be connected, and the bevel pinion, 25, be made to mesh with the large bevel gear, 26. The conveyer rope with flights attached, will be passed around sprockets, 13, and 16, and made endless by joining the several sections. Sprocket, 16, will be adjusted to give the rope, 14, suitable idle tension. The discharge door or doors of the car will now be opened, and some of the material of the car will fall upon the receiving hopper of the conveyer. The conveyer will now be operated in a direction to carry or drag the material from the receiving hopper out through the conveyer trough and discharge it from its outer end. As rapidly as the material is removed from the receiving hopper, more material will fall upon it from the car, so that the conveyer may be continuously operated until there is no more material left in the car. After the car has been emptied, the conveyer may be disassembled and carried in its constituent parts to the next car, or to any other place where a car is to be unloaded, there to be reassembled and operated as desired.

It will be seen that the number of laborers required for unloading the car is reduced to a minimum as none of the material need be shoveled over the sides of the car, and none of the material need be shoveled away from the road bed adjacent to the car. It is obvious that any other form of motive power besides man power may be applied to drive the conveyer if desirable and convenient, and thus still further reduce the amount of labor required for unloading and carrying away the material. To adapt my method and apparatus to be used in places remote from sources of power, I prefer, however, to provide means for its operation entirely by man power.

I claim:

1. An apparatus of the class described, comprising a shallow hopper having a closed bottom and adapted to be placed under a loaded car and upon the rails upon which the car stands, and a trough connected to one end of said hopper, the bottom of said trough forming a continuation of the bottom of said hopper, and a conveying element having flights mounted to operate through said trough and upon the closed bottom of said hopper.

2. An apparatus of the class described, comprising a shallow hopper having a closed bottom and adapted to be inserted under a loaded car and upon the rails upon which the car stands, a conveyer trough connected to one end of said hopper and provided with a bottom forming a continuation of the bottom of said hopper, means secured to said hopper for engaging the rails to position the hopper beneath the car and prevent its movement transversely of the rails, and a conveying element having flights mounted to operate through said conveyer trough and upon the closed bottom of said hopper.

3. An apparatus of the class described, comprising a shallow hopper adapted to be inserted under a loaded car and upon the rails on which the car stands, said hopper being provided with a closed bottom and upstanding sides and ends, to permit the feeding of the material to the hopper from above and prevent its overflowing to the roadbed, a conveyer trough connected to one end of said hopper and provided with a bottom forming a continuation of the bottom of the hopper, and a conveying element having flights mounted to operate through said conveyer trough and over and upon the closed bottom of said hopper.

4. An apparatus of the class described, comprising a shallow hopper provided with a closed bottom, a conveyer trough narrower than said hopper and connected to one end thereof in horizontal alinement therewith, and a conveying element having flights approximately equal in diameter to the width of said trough and mounted to operate through said conveyer and over and upon the bottom of said trough a distance from one side thereof, to provide space in the shallow hopper to receive the material from the car in a greater quantity than could be supplied to a trough of the width of the flights.

5. An apparatus of the class described, comprising a wide shallow hopper pro-

vided with a closed bottom and adapted to be positioned beneath and transversely of a dump car between the bottom discharge opening and the track rails, a relatively narrow shallow conveyer trough connected to one end of said hopper, and a conveying element having flights approximately as high as the full depth of said hopper and mounted to operate upon the closed bottom of said hopper to carry the material from said hopper through said trough.

6. An apparatus of the class described, comprising a wide shallow hopper provided with a closed bottom and adapted to be positioned beneath and transversely of a dump car between the bottom discharge opening and the track rails, a relatively narrow shallow conveyer trough connected to one end of said hopper, and a conveying element having flights approximately as high as the full depth of said hopper, and mounted to operate centrally upon the closed bottom of said hopper to carry the material through the hopper and trough.

7. An apparatus of the class described, comprising a wide shallow hopper provided with a closed bottom and an apron at one side having a depressed end, said hopper being adapted to be positioned transversely beneath a dump car between its bottom discharge opening and the track rails, a relatively narrow shallow conveyer trough connected to one end of said hopper, and an endless conveying element having flights approximately as high as the depth of the hopper and mounted to position one leg thereof within the hopper and trough, and the other leg on the outside of the same in the same horizontal plane of the first mentioned leg, said last mentioned leg adapted to engage the depressed end of the apron on the hopper to guide it over the track rails.

In testimony whereof I affix my signature in presence of two witnesses.

TRACY W. GUTHRIE.

Witnesses:
A. M. McMuir,
W. W. Gillett.