Dec. 9, 1952 E. R. MARDEN 2,621,035

TRAIN WEIGHING METHOD

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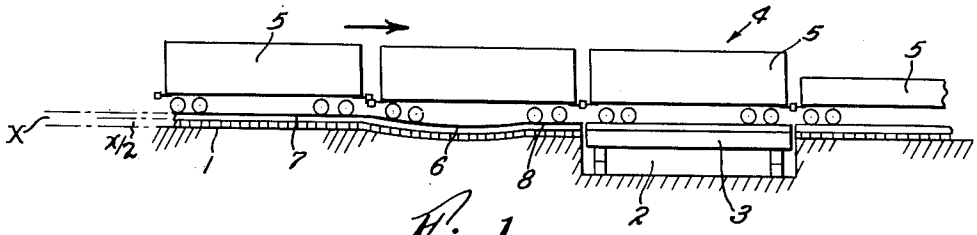

Fig. 1

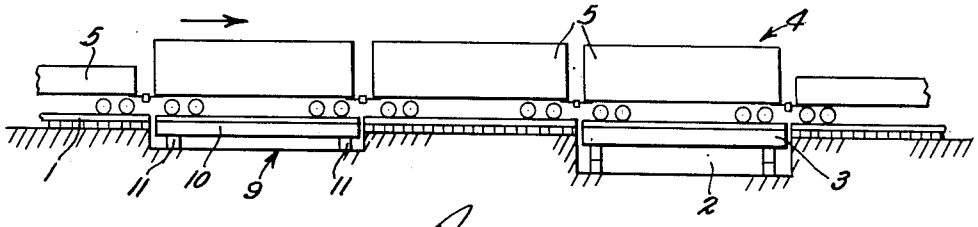

Fig. 2

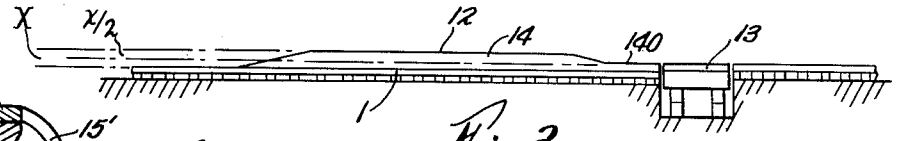

Fig. 3

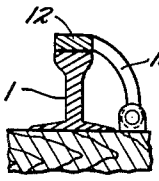

Fig. 4

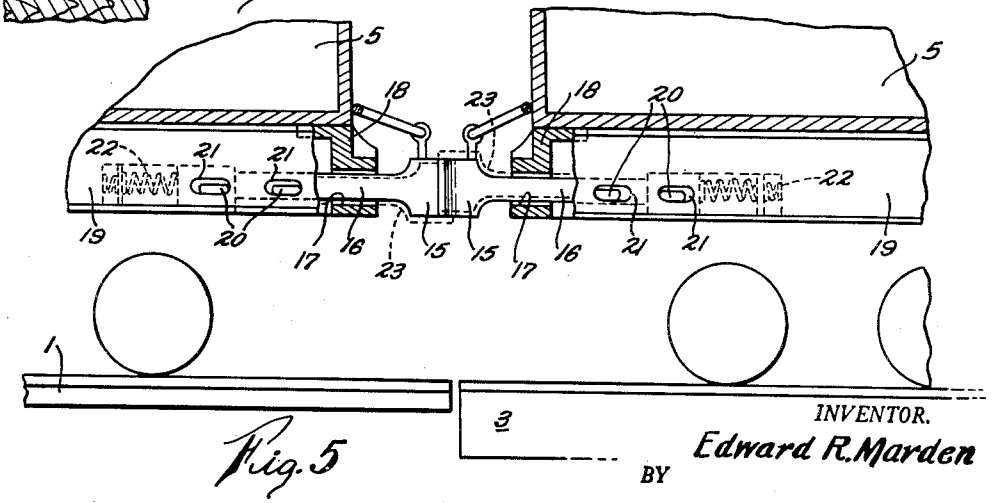

Fig. 5

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TRAIN WEIGHING METHOD

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2 Claims. (Cl. 265—27)

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This invention relates to improvements in the weighing of freight cars coupled in a train, and is particularly directed to a method of obtaining an accurate recordation on a scale of the weight of each of a succession of cars in a coupled train.

At the present time each freight car in a train is uncoupled from the train and weighed in uncoupled condition whilst standing alone upon the platform of a railroad yard scale. Obviously this practice entails considerable coupling and uncoupling of cars in the train but is deemed necessary to obtain a recorded weight for each car that is within the margin of error now required for car weight records under government regulations. Various means have therefore been suggested for succesively weighing each car in a coupled train of cars, but the car weights recorded by the suggested devices did not meet the standard of accuracy imposed by said governmental regulations. I have found that accurate car weights can be obtained when a succession of cars in coupled conditions are moved across the platform of a railroad yard scale, and only when, the couplers of the car on the scale platform are free from all vertically acting forces which are normally transmitted to them through the associated couplers on adjacent cars.

During train motion adjacent cars are frequently on different track levels so that the draw bars of connected couplers are forcibly brought into contact with the coupler carry irons on their respective car bodies. This coupler condition is frequently maintained during continued train movement and when the train is at a standstill because in either case the couplers on adjacent cars are in a stretched or compressed condition along the line of draft, and that condition binds the associated couplers to prevent their vertical readjustment. As a result of this condition the weighing of the cars in a coupled train produces inaccurate, individual car weights because the bound couplers between adjacent cars transmit either upwardly or downwardly acting forces on the cars to be weighed on the scale platform thereby either decreasing or increasing respectively the actual weight of the car and causing an objectionable error in the recorded car weight.

It is therefore an object of this invention to provide a method of successively and positively conditioning the connected couplers on a coupled train of cars in advance of the weighing platform so that the couplers on a succession of cars moved upon the platform will be free of vertically acting forces from adjacent cars.

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Other objects of the invention will be apparent from the following specification and drawings, wherein:

Fig. 1 is a diagrammatic view of one form of my invention.

Fig. 2 is a diagrammatic view showing a modified form of my invention.

Fig. 3 is a diagrammatic view showing another modified form of my invention.

Fig. 4 is a cross-sectional view showing a detail of a further modification of my invention.

Fig. 5 is an enlarged, detail view of the usual couplers between adjacent cars that have been conditioned by the means and method of my invention prior to weighing either car, an objectionable coupler condition being shown in dotted lines therein.

With reference to Fig. 1 of the drawings the numeral 1 indicates a track section in a railroad yard which has the usual weighing scale 2 interposed therein. The scale is preferably of the type now in use for weighing railroad cars and comprises a depressible platform 3 of a length to just accommodate one car of a coupled train at a time. The vertical displacement of the aforesaid scale platform under load must be held to a minimum, and in this respect it is important that the displacement between the unloaded platform position and its loaded position shall not exceed one half of the total vertical displacement of a coupler draw bar for purposes to be described hereinafter. A recorder (not shown) of any approved construction is connected with the platform and is responsive to the movement of the platform to record the weight of the car positioned thereon.

A train 4 of coupled freight cars 5 is moved in the direction of the arrow to successively position each freight car entirely and alone upon the platform 3 of the scale. As each car assumes a position upon the platform the train 4 is preferably stopped momentarily in order that its weight may be printed by the scale recorder. There are various devices associated with railroad yard scales which provide for the weighing of a succession of cars in a coupled train whilst each car or each car truck pases in continuous motion across the scale platform and such devices could be incorporated in scale 3 without departing from the scope of this invention.

The means depicted in Fig. 1 for obtaining connected coupler equalization between adjacent cars to thereby obtain an accurate recordation of the weight of each of a succession of cars in a coupled train comprises a dip or depression 6 formed in the track 1 at a point in advance

of the scale 2 with respect to the direction of movement of the train 4.

This depression is disposed adjacent the scale 1 in order that coupler equalization will be attained just as the truck adjacent the coupler on the car to be weighted moves upon the scale platform. Connected coupler equalization is obtained by constructing the depression so that it has a predetermined depth and is located between a first track portion 7 and a second track portion 8, with relation to the movement of the train. Said track portions are on opposite sides of the depression and on different predetermined levels. It will be noted that the elevation of the track portion 7 with respect to the deepest part of depression 6 is represented in Fig. 1 by the letter X and that it is twice the elevation of track portion 8 relative to the bottom of the depression and is indicated by the fraction $x/2$ in said view.

The level differential X between the bottom of the depression and the level of the first track portion 7 is made equal to the total vertical displacement of the coupler draw bars on their respective cars so that when the trucks on adjacent cars leave the first track section and enter the depression the coupler draw bars will be forced in opposite vertical directions until they contact their respective carrying irons. As the said trucks leave the depression and enter the second track portion 8 the vertical movements of the draw bars are reversed and each moves only half their displacement distance within the irons thereby placing the bars centrally of the iron openings and relieving them of all vertically acting forces for the weighing operation. Obviously the showing in the drawings is greatly exaggerated and it should be stated here that the value X in the foregoing description should not exceed 2'', and the value $x/2$ would then equal 1''.

As illustrated in Fig. 2 of the drawings, wherein like reference numerals identify identical parts described in Fig. 1, the numeral 9 indicates a car raising and lowering device which has a platform 10 supported upon suitable jacks 11 which are preferably actuated by an hydraulic means (not shown). The depression 6 and the jack operated platform 10 perform identical functions in that they act as equalizers for the couplers between adjacent cars as said cars successively pass across them; the only difference being that whereas the depression is a stationary means for placing adjacent cars on different levels the jack must be intermittently actuated to obtain this level differential between adjacent cars.

When a single car or one car truck is upon the jack platform the jack platform is raised a predetermined distance equal to the distance identified as X in Fig. 1 and is then lowered a distance equal to the value $x/2$ whereby the connected couplers on adjacent cars are successively equalized in advance of the weighing operation.

In Fig. 3 there is shown a shoe 12 secured to the track 1 in any suitable manner and located at a place thereon in advance of a double draft weighing scale 13, i. e. a scale on which a car is weighed in two operations. The shoe has a first portion 14 and a second portion 140 on different levels, the first portion having twice the elevation from the track as the second level 140. The shoe functions just like the depression to equalize draw bar couplers on adjacent cars before weighing as said cars pass in succession thereover. As shown in Fig. 4 the shoe 12 may be removably mounted on the track by a series of spaced arms 15' which are secured at their upper ends to the shoe and are pivoted to the track in any suitable manner or by brackets fixed to the ties as depicted in Fig. 4.

It will therefore be understood that the devices illustrated in Figs. 1 to 4 all function to position coupled adjacent cars in a train on different predetermined levels as they pass over them on their way to the scale. This level differential acts to initially move the coupler on the leading car to a different level from that of the coupler on the trailing car and to then reverse the coupler movements by an amount approximately half that of the initial movement so that the relative heights of said associated couplers are so adjusted that their car connecting draw bars are free of all vertically acting forces from their respective car bodies.

Fig. 5 best depicts the connected coupler action between adjacent cars just described and with reference thereto the numerals 15—15 indicate the usual car couplers with their knuckles in locked condition to provide a draft connection between adjacent cars 5—5. Each coupler has a draft bar 16 which passes through an enlarged opening 17 formed in a carry iron 18 that is in turn bolted or otherwise connected to the end of the spaced center sills 19 of said cars. Draft keys 20 extend laterally from the bar and pass through suitable slots 21 formed in the sills, said slots being larger than the keys to provide lost motion between the sills and the bars. The numeral 22 generally indicates the usual draft gear buffers associated with the bars to absorb shock from sudden stretching or compressibe forces exerted on the couplers in a well known manner.

In the connected coupler position indicated by full lines in Fig. 5 it will be noted that the draft bars are equalized in that they are centrally positioned in their openings 17 in the carry irons and therefore vertical forces cannot be transmitted to said bars through the irons. Dotted lines 23 illustrate objectionable positions of connected couplers in unequalized condition wherein the draw bar on the right coupler is forcibly in contact with the upper end of its carry iron and the draw bar of the left coupler is forcibly in contact with the bottom end of its carrying iron so that part of the weight of the right hand car is transmitted through the couplers and carried by the left hand car thereby making the right hand car weigh "light" and the left car weigh "heavy" when said cars are individually weighed on the conventional scales. As has been said connected couplers on adjacent cars in a train are susceptible of vertical relative movements, but when the train is in stretched or compressed condition, the couplers tend to bind and become relatively rigid sufficient to transmit appreciable forces therethrough when cars with unequalized couplers are weighed.

It will therefore be noted that I have provided a simplified and effective method of obtaining accurate car weights in coupled weighing of a train of cars by providing a track which has a coupler equalizer positioned therein in advance of the scale 2, said equalizer acting to positively position connected couplers between adjacent cars so that their draw bars are free of all

vertically acting forces which would, if present, give an inaccurate recorded weight for both cars.

What is claimed is:

1. The method of individually weighing successive freight cars in a coupled train comprising moving a train of coupled cars along a track so that the trucks of successive cars therein are positioned upon a track scale portion responsive to the weights of said cars, adjusting the heights of the connected couplers with respect to each other on adjacent cars in advance of the track portion responsive to the weights of said cars so that the couplers connecting adjacent cars are free of all vertically acting forces, and noting the weight of each successive car whilst maintaining its couplers free of all vertically acting forces transmitted therethrough from adjacent cars.

2. The method of individually weighing successive freight cars in a coupled train comprising moving a train of coupled cars along a track so that the trucks of successive cars therein are positioned upon a track scale portion responsive to the weights of said cars, adjusting the heights of the connected couplers on adjacent cars in advance of the track portion responsive to the weights of said cars by moving the cars across

a first track portion and then upon a second track portion each disposed on different levels with respect to the level of the track, whereby the couplers connecting adjacent cars are free of all vertically acting forces, and noting the weight of each successive car whilst maintaining its couplers free of all vertically acting forces transmitted therethrough from adjacent cars.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
988,542	Bohannon	Apr. 4, 1911
1,057,881	Robichaux	Apr. 1, 1913
1,218,253	Gordon	Mar. 6, 1917
1,544,988	Hutton	July 7, 1925
2,543,806	Roesser	Mar. 6, 1951

FOREIGN PATENTS

Number	Country	Date
631,820	Germany	June 27, 1936