May 13, 1958 H. R. STRAIGHT ET AL 2,834,486

CAR CLAMP AND MECHANISM FOR OPERATING THE SAME

Filed March 23, 1955

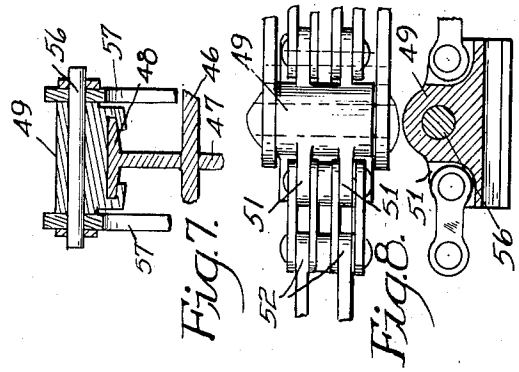


Fig. 7.

Fig. 8.

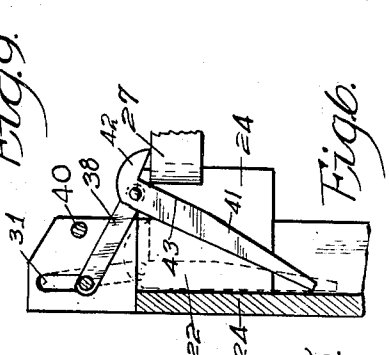


Fig. 9.

Fig. 6.

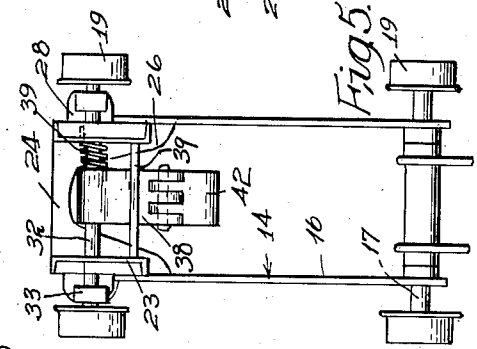


Fig. 5.

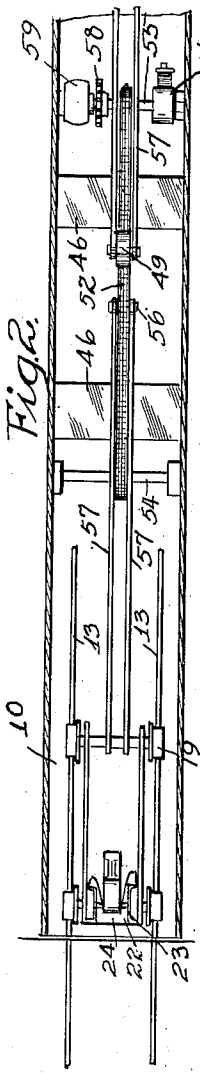


Fig. 2.

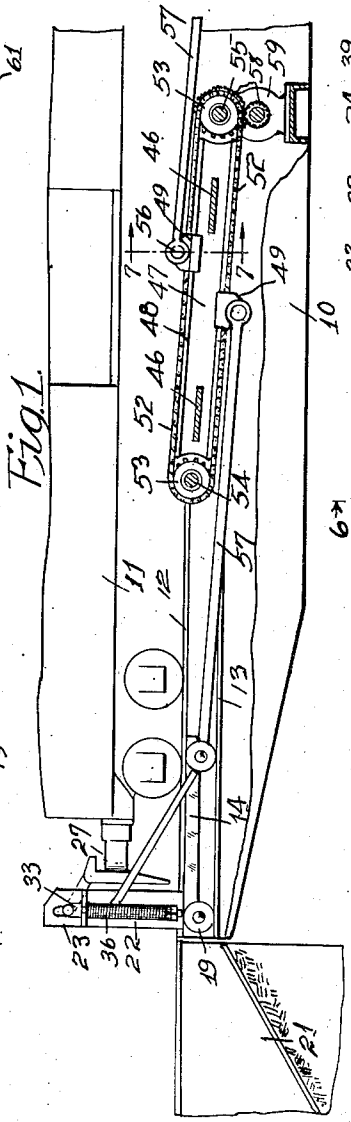


Fig. 1.

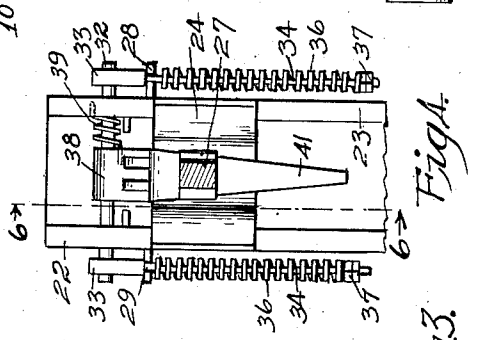


Fig. 4.

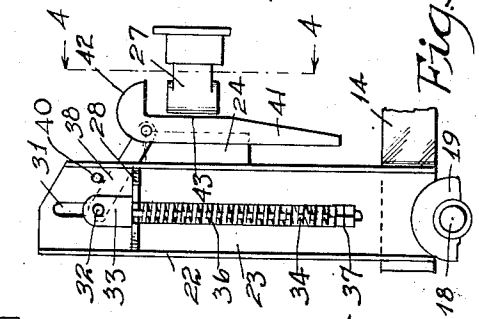


Fig. 3.

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CAR CLAMP AND MECHANISM FOR OPERATING THE SAME

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6 Claims. (Cl. 214—55)

This invention relates to that type of car dumpers in which the dumper employs a tiltable cradle for supporting the car to be emptied wherein the car may first be tilted transversely and then rocked longitudinally in the performance of its dumping operations, the car being centered longitudinally and locked in said centered position by means of movable clamp supports, and more particularly to that type in which the cradle and car are tilted transversely to an amount greater than 15° to the horizontal and less than the amount required to cause the car to be turned over by gravity.

The object of our invention is to provide improved means for holding down or locking the car against becoming accidentally over-balanced while in its transverse tilted position for any unusual reason, such as a very strong wind or too rapid acceleration of the transverse tilting movement, wherein the car may be tilted to substantially an angle of 20°.

A further object of our invention is to provide hold-down means of the type above described and adapted to be applied to the top of the car coupler; improved means for automatically applying a predetermined amount of yieldable pressure to said coupler by movement of the clamp elements toward the coupler wherein a comparatively uniform amount of pressure may be automatically applied to the coupler regardless of the variations in the heights of couplers in cars of different makes.

A further object of our invention is to provide in a car dumper of the type above described; improved means for centering and locking the car against longitudinal movement of the said cradle.

Our invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated and attained, as hereinafter more fully set forth, pointed out in our claims and illustrated in the accompanying drawings, in which:

Fig. 1 is a segmental side elevation of a dumper cradle and the lower portion of a box car supported thereon, showing the manner that our improved device is mounted therein.

Fig. 2 is a top view of the same.

Fig. 3 is an enlarged side elevation of our improved clamp device.

Fig. 4 is an end elevation of the same taken on the line 4—4 of Fig. 3.

Fig. 5 is a top plan view of Fig. 4 as applied to the clamp truck.

Fig. 6 is a detail sectional view taken on the line 6—6 of Fig. 4.

Fig. 7 is a detail sectional view taken on the line 7—7 of Fig. 1.

Fig. 8 is a fragmentary enlarged top plan view of a shoe and chain assembly in the device of this invention; and

Fig. 9 is a transverse sectional view of the assembly shown in Fig. 8.

Referring to Fig. 1 of the drawing we have used the reference numeral 10 to indicate the cradle of a car dumper, the mechanism for imparting longitudinal rocking movement and transverse tilting movement being not illustrated and described as they form no part of the present invention. The numeral 11 indicates a box car mounted on rails 12, the car being movably mounted thereon to be moved onto and from said cradle while in its normal horizontal position. For centering and locking the car on its tracks while in its rocked and inclined positions, we have provided the following mechanism. In each end of the cradle 10 we have provided track-ways 13 for supporting a clamp supporting truck 14 comprising a horizontal frame 16 including an inner axle 17 and an outer axle 18, said axles supporting guide wheels 19 mounted to travel on the tracks 13 while clamping the car 10 and adapted to be moved into a pit 21 adjacent to each end of the cradle when the trucks 14 are not in use.

The outer end of the frame 14 is provided with an upright clamp support 22 comprising a pair of spaced channels 23 having their lower ends fixed to the outer ends of the frame members 16 and above the outer axle 18. A guide and spacer head 24 is mounted between and near the upper ends of the channels 22, said head having inwardly and diverging flanges 26 for receiving between them the coupler knuckle 27 for guiding the coupler transversely as the head is moved toward the coupler with the end of the knuckle against said head. The upper end of said channels 22 are also provided with laterally projecting flanges 28 having notches 29. The upper ends of the channel each having a vertical slot 31 for receiving a horizontal pressure bar 32 having its ends extending beyond the sides of said channels, as clearly illustrated in Fig. 4. Each end of said bars supporting a pressure head 33 mounted on the upper end of a pressure rod 34, said rods being mounted in the slots 29 and depending therefrom with the heads 33 resting on the flanges 28. Mounted on each of the rods 34 is a compressive spring 36. Nuts 37 are provided on the lower ends of said rods for adjusting the pressure of said springs and the hold-down pressure applied to said heads 33. Mounted on the central portion of said bar 32 is one end of a link 38 said link being normally inclined downwardly and inwardly as viewed in Fig. 3, a spring 39 being provided for maintaining the link in said inclined position against a stop rod 40. Pivotally connected to and depending therefrom is contact bar 41 having formed on its upper end an inwardly extending contact flange 42 its under surface being adapted to engage the upper surface of the coupler knuckle 27 while the upper end of the inner face of the bar 41 is adapted to engage the end of said knuckle as the clamp supports are moved toward the ends of the cars. The under face of the flange 42 is normally supported slightly above the top surface of the highest couplers operated in the railway system whereby downward pressure may be applied to couplers of various heights. As the clamp supports are moved inwardly the contact face 43 of the bar 41 will engage the outer end of the knuckle 27 continued inward pressure first causing the lower end of the bar 41 to swing outwardly as illustrated in Fig. 6 with the lower end of said bar 41 engaging the plate, further inward movement of the clamp support will cause the inner end of the link 38 to swing downwardly and outwardly, first moving the member 42 to position against the upper surface of the knuckle 27. As inward pressure further is applied to the clamp supports, upward pressure will be applied to the pressure bar 32 and to the springs 36 and in turn downward pressure to the flange 42 as the bar 41 is moved to the dotted line position in Fig. 6. Thereby applying a comparatively uniform and predetermined downward pressure to the top face of the coupler knuckle, by providing a longspring 36 compared to the amount of variation in the heights of the car couplers we have provided means whereby a quiet uniform

predetermined downward pressure may be applied to the coupler, the total amount of downward pressure being less than the safe breaking load of the coupler.

The mechanism for moving the clamp supports to and from each other will now be described.

We have provided near the longitudinal center of the cradle a pair of transversly arranged plates **46** supporting at their centers a longitudinally arranged I-beam **47** having slidably mounted on each of its top and lower flanges a chain supporting shoe **49** said shoe having lugs **51** to which the ends of multiple roller chains **52** are attached. Said chains being mounted on sprockets **53**, said sprockets being mounted on transverse shafts **54** and **55**, and when so mounted forming a continuous chain having a shoe **49** in each of its upper and lower runs as clearly illustrated in Fig. 1. Each of the runs being longer than the maximum movement of the carriage **14** from position within the pit **21** to its limit of movement required to center the shortest car employed for the movement of material to be dumped.

Each of the shoes **49** is provided with a transverse shaft **56**, pivotally connected to each of the shafts **56** is one end of links **57** the other end of said links **57** being connected to the inner axle **17** of the carriage **14** as illustrated in Figs. 1 and 2. By this arrangement it will be seen that if the chain **52** is rotated in a clock-wise direction the carriages will be simultaneously moved into the pits **21**, rotating the chains in the opposite direction will move the carriages inwardly to center the car. Suitable gear mechanism **58** is applied to the shaft **55** for rotating said shaft in either direction by means of a reversible motor **59**, a magnetic brake device **61**, being provided to lock the mechanism after the current has been switched off by the switch not shown. The detail structure of the mechanism for imparting reversible rotary movement to the shaft **55** we will not describe, as they form no part in our invention in other than providing power for the operation of said shaft.

We claim:

1. The combination of a car supporting cradle mounted to tilt longitudinally and transversely of itself and adapted to support a railway box car having at each end a standard D type coupler, a clamp support movably mounted on each end of said cradle to move toward and from said coupler, said clamp support including a pair of spaced upright plates, having near their upper ends vertical slots and below said slots laterally projecting and notched flanges, a horizontal pressure bar slidably mounted in said slots, a spring supporting rod having a head at its upper end pivotally mounted on each end of said pressure bar with the heads resting on said notched flanges with the rods in said notches, a helical spring supported on each rod with its upper end against the under side of said flanges, adjusting nuts on the lower ends of said rods, a horizontally inclined link having one end fixed to the central portion of said pressure bar, means yieldably maintaining said link in an inclined position relative to the horizontal, said link being mounted for swinging movement downwardly from said inclined position to a vertical position, a vertical and elongated contact bar having its upper end pivotally connected to the lower end of said link and depending therefrom, having at one side a contact face and at its upper end a laterally projecting contact flange adapted to engage the free end and the upper face of said coupler respectively, the upper contact face being normally supported above the level of the top of the coupler and adapted to be lowered to engage the top of the coupler as the free end of the coupler is engaged by the vertical contact face of the contact bar by movement of the clamp support toward the coupler.

2. The combination of a car supporting cradle mounted to tilt longitudinally and transversely of itself and adapted to support a railway box car having at each end a standard D type coupler, a clamp support movably mounted on each end of said cradle to move toward and from said coupler, including a pair of spaced upright plates, a coupler centering head mounted therebetween, a pressure bar vertically and slidably mounted in the upper ends of said upright plates, yieldable means maintaining said pressure bar at its lower position of movement, a horizontally inclined link having one end secured to said pressure bar, yieldable means maintaining said link in an inclined position relative to the horizontal, said link being mounted for swinging movement downwardly from said inclined position to a vertical position, a vertical and elongated contact bar having its upper end pivotally connected to the lower end of said link and depending therefrom having at one side a contact face and at its upper end a laterally projecting contact flange, adapted to engage the free end and the upper face of said coupler respectively, the upper contact face being normally supported above the level of the top of the coupler and adapted to be lowered to engage the vertical contact face of said contact bar by movement of the clamp support toward the coupler.

3. The combination of a car supporting cradle mounted to tilt longitudinally and transversely of itself and adapted to support a railway box car having at each end a standard D type coupler, a clamp support movably mounted on each end of said cradle to move toward and from said coupler, including a pair of spaced upright plates, a coupler centering head mounted therebetween, including a pair of diverging flanges, a pressure bar vertically and slidably mounted in the upper ends of said upright plates, yieldable means maintaining said pressure bar at its lower position of movement, a horizontally inclined link having one end secured to said pressure bar, yieldable means maintaining said link in an inclined position relative to the horizontal, said link being mounted for swinging movement downwardly from said inclined position to a vertical position, a vertical and elongated contact bar having its upper end pivotally connected to the lower end of said link and depending therefrom and between said diverging flanges and having at one side a contact face and at its upper end a laterally projecting contact flange, adapted to engage the free end and the upper face of said coupler respectively, the upper contact face being normally supported above the level of the top of the coupler and adapted to be lowered to engage the vertical contact face of said contact bar by movement of the clamp support toward the coupler.

4. The combination of a car supporting cradle mounted to tilt longitudinally and transversely of itself and adapted to support a railway box car having at each end a standard D-type coupler, a clamp support movably mounted on each end of said cradle to move toward and from said couplers, means for moving said clamp supports comprising, an endless chain mounted longitudinally and centrally of said cradle and supported by sprockets mounted on axles transverse of said cradle, a link pivotally connected to the inner end of each of said clamp supports, each of said links having its inner end extended to said chain, means pivotally connecting the inner end of one link to the upper run of said chain, and the inner end of the other link to the lower run of said chain, power means for imparting reversible power to rotate said sprockets, a coupler engaging member for each clamp support having portions for engaging the top end of a coupler with the top engaging portion normally above the level of the top surface of the coupler, pressure applying means actuated by the movement of the clamp support towards its corresponding coupler, for first lowering the coupler engaging member in contact with the coupler, and upon further inward movement of the clamp supports causing a predetermined downward pressure to be applied to the coupler for stabilizing the car against tipping while in its transverse tilted position.

5. The combination of a car supporting cradle mounted to tilt longitudinally and transversely of itself and adapted

to support a railway box car having at each end a standard D-type coupler, a clamp support movably mounted on each end of said cradle to move toward and from said couplers, means for moving said clamp supports comprising, an endless chain mounted longitudinally and centrally of said cradle and supported by sprockets mounted on axles transverse of said cradle, a link pivotally connected to the inner end of each of said clamp supports, each of said links having its inner end extended to said chain, means pivotally connecting the inner end of one link to the upper run of said chain, and the inner end of the other link to the lower run of said chain, power means for imparting reversible power to rotate said sprockets, a yieldable means for applying pressure to said car couplers comprising a pressure bar mounted on said clamp support for substantially vertical movement relative thereto, yieldable means maintaining said pressure bar at its lower position of movement, a horizontally inclined link having one end secured to said pressure bar, yieldable means maintaining said link in an inclined position relative to the horizontal, said link being mounted for swinging movement downwardly from said inclined position to a vertical position, a vertical and elongated contact bar having its upper end pivotally connected to the lower end of said link and depending therefrom having at one side a contact face and at its upper end a laterally projecting contact flange, adapted to engage the free end and the upper face of said coupler respectively, the

upper contact face being normally supported above the level of the top of the coupler and adapted to be lowered to engage the vertical contact face of said contact bar by movement of the clamp support toward the coupler.

6. In car dumping apparatus which includes a supporting cradle for a railway box car having a coupler at each end, means on said cradle for clamping said car on a cradle against longitudinal movement, said means comprising a clamp support arranged at each end of the car for movement toward and away from the car in a direction longitudinally thereof, a coupler engaging member movably mounted on each clamp support for yieldable movement between a pair of horizontally spaced positions, said engaging members each having a substantially horizontal flange normally disposed above said couplers, with the coupler engaging member being mounted for up and down swinging movement on yieldable horizontal movement thereof for engaging said flange with said coupler on the downward swinging movement of said engaging member.

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