Nov. 16, 1954 W. F. DIETRICHSON 2,694,498

IMPACT DEVICE FOR HOPPER CARS

Filed Dec. 29, 1951 2 Sheets-Sheet 1

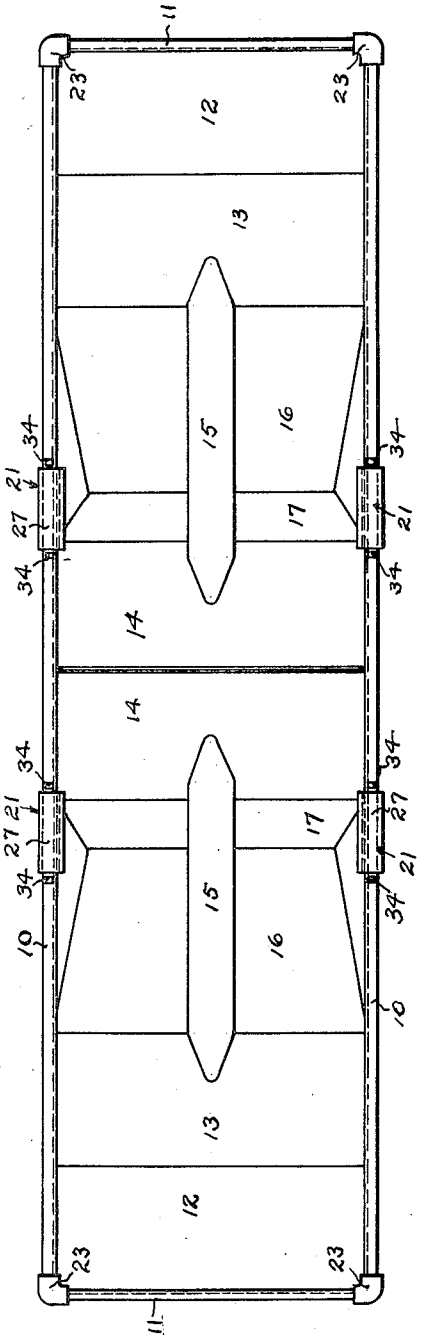


Fig. 1

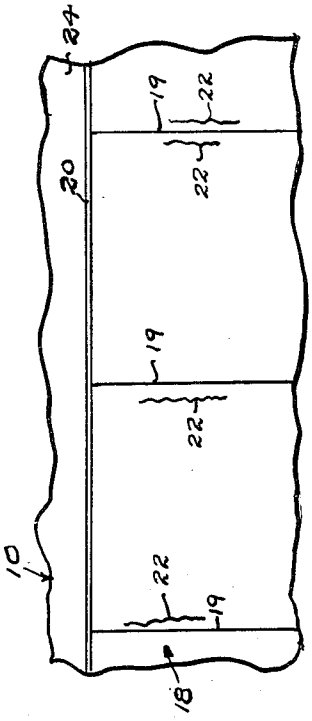


Fig. 2

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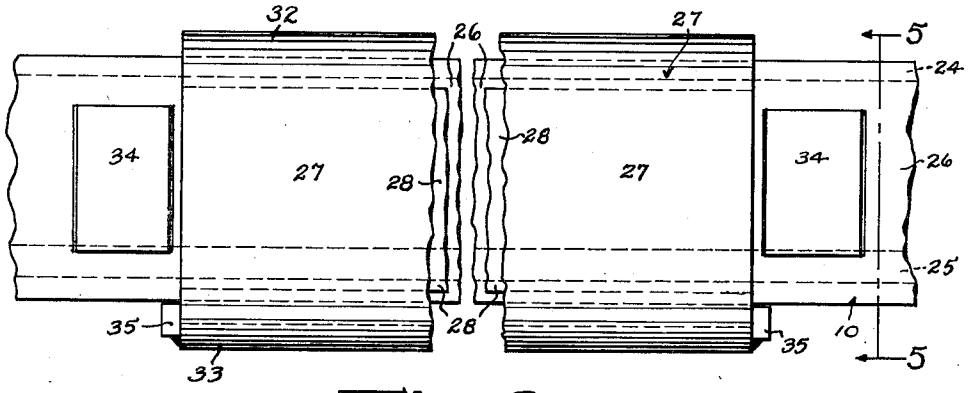


Fig. 3

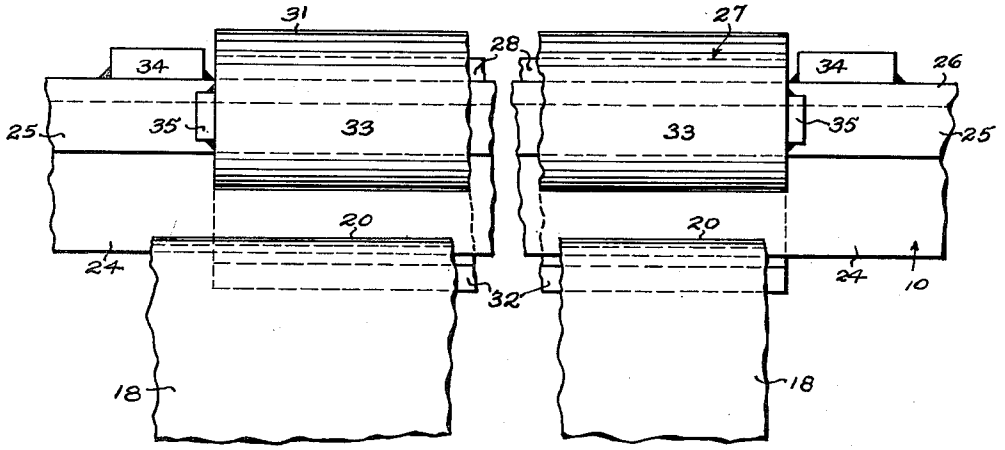


Fig. 4

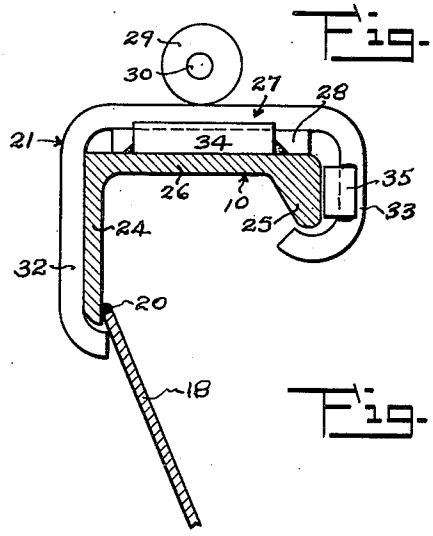


Fig. 5

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United States Patent Office 2,694,498 Patented Nov. 16, 1954

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IMPACT DEVICE FOR HOPPER CARS

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Application December 29, 1951, Serial No. 264,205

3 Claims. (Cl. 214—83.3)

This invention relates to hopper cars, and more particularly to impact devices applied to hopper cars for receiving blows from a power agitator or hammer to assist in the discharge therefrom of bulk lading.

In the transportation of certain types of bulk lading in hopper cars, it has been found that the lading becomes packed to such a degree that it will not freely discharge when the hopper car outlets are opened. Various vibration and agitating devices have been employed for assisting the discharge of packed lading from hopper cars. One form of such devices, used in conjunction with hopper cars, provides for striking the chords at the top of the side walls with a power hammer. Hopper cars generally include walls formed of secured together sheets of metal, top chords and posts, the securement between such elements usually being made by riveting or welding. When the hammer blows are struck rather severely against the upper faces of the top chords, the impacts set up vibrations, flexing the areas in the metal wall sheets between the welds or rivets causing fatigue and ultimate cracking of the metal sheets.

It is an object of the invention to reduce the vibration created in hopper car side walls resulting from impacts against the top chords through the use therewith of cushioned impact receiving devices.

Another object of the invention is to provide the top chords of a hopper car for the transportation or storage of bulk material with impact receiving devices formed partly of resilient material.

A further object of the invention is to provide an impact receiving device for a hopper car in which a striking plate is assembled and secured on the top chords of the side walls in a manner permitting limited movement thereof in vertical, longitudinal and transverse directions without detachment.

These and other objects of the invention will be apparent to those skilled in the art from a study of the following description and accompanying drawings, in which:

Fig. 1 is a plan view of a hopper car having the invention associated therewith.

Fig. 2 is a fragmentary elevation of a side of the hopper car.

Fig. 3 is a plan view of one of the impact receiving devices associated with a side top chord of a hopper car.

Fig. 4 is a side view of one of the impact receiving devices associated with a fragment of a side wall of a hopper car.

Fig. 5 is a sectional view taken on line 5—5 of Fig. 3 showing the impact receiving device in end elevation.

The hopper car shown in the drawings is of a conventional dual outlet type. The hopper body structure includes side wall top chords **10**, end top chords **11**, slope sheets **12** and **13** at each end of the car, central ridge sections **14** overlying portions of the center sill **15**, hopper structures **16** and bottom gates **17**. The side walls **18** are formed of sheet metal sections and are preferably seam welded together and welded to the slope sheets, hoppers and ridge sections. The welds connecting the side wall sections are indicated by numeral **19** and the welds between the side walls and the top side chords are indicated by numeral **20**.

When power devices are utilized to impact or hammer directly against the hopper side top chords for the purpose of assisting gravity in discharging certain types of bulk material through the hopper bottom openings, it is found that vibrations are produced in the sheet metal wall structure of a magnitude sufficient to flex areas between the welds and thereby create fatigue of the metal to such an extent that cracking, as indicated by line **22** in Fig. 2, occurs. This invention proposes to remedy such cracking of the wall structure resulting from hammering the top chords by the provision of cushioned impact devices **21** applied to the car side top chords. The impact devices are preferably located above the hopper outlet portions of the car on each side of the car.

The ends of the side and top chords of the hopper structure are secured together by brackets **23**. Chords **10** are channel shaped in cross-section having an outside flange **24** and an inside flange **25** depending from the sides of a horizontal top **26**. Flange **25** is bulbular and considerably shorter than flange **24**.

The impact receiving devices **21** are preferably similar and comprise a formed metal anvil member **27** and a cushion member **28** in the form of a pad. These pads rest on and are of less width than the top of side chords. The top of the anvils are assembled to rest on the cushion pads with their legs **32** and **33** outside of the chord flanges. The legs of the anvil members are of sufficient length so that there is some clearance between their curved lower ends and the bottom surfaces of the adjacent chord flanges under which they lie. The legs of the anvil members are spaced apart sufficiently so that leg **35** can be swung under the bottom of chord flange **25** while being applied to the chord with a transverse tilting movement. After the anvil members have been positioned on the chords, they are retained against vertical displacement from the chords by members **35** welded to each end of the anvil leg **33**. Such retainer members project inwardly from the legs **33** a distance such that they are slightly spaced from the chord flange **25** and thereby prevent tilting of the anvil members sufficiently to allow their removal from the chord. Longitudinal movement of the impact receiving devices is restricted by stop members **34** welded on the top wall **26** of the chords.

Suitable hammer means may be employed for striking the top surface anvil members. One form of such device, shown in Fig. 5, consists of a roller **29** fixed eccentrically on power shaft **30**.

As previously explained, the impact receiving devices are retained on the chords in a manner to permit limited vertical, transverse and longitudinal movement of the anvil members. When the top of the anvil member of an impact receiving device is struck by the power hammer, the force will be transferred to the side chords through the cushion member which, due to its resiliency, will reduce the magnitude of the vibrations that would otherwise be set up in the car side walls. In this manner flexing and cracking of the side wall panels in areas intermediate the weldments or other securing means are materially reduced.

The invention may be modified in various respects as will occur to those skilled in the art and exclusive use of all modifications as come within the scope of the appended claims is contemplated.

What is claimed is:

1. In a sheet metal hopper car having upper channel shaped chords, striker plates bent to extend around the outer faces of the chords and in spaced relation thereto, the legs of said plates being turned inwardly to extend below the legs of the chords, retainer members on one of the legs of the plates adapted to engage the chords to prevent vertical displacement from the chords, stop means on the chords beyond the ends of the plates limiting longitudinal movement of the plates, and cushioning pads between the top surfaces of the chords and the striker plates.

2. In a hopper car having upper channel shaped chords, channel shaped anvil plates formed to extend around the chords in spaced relation therewith and with their legs turned inwardly beneath the legs of the chords, stop means fixed on the chords slightly beyond the ends of the plates, means applied to the anvil plates in close proximity to a flange of the associated chord limiting movement relative to the chords in a transverse direc-

tion, and cushion means between the upper surfaces of the chords and the striker plates thereabove.

3. In a hopper car having metal sides with channel shaped top chords, said chords having a depending short leg and a depending longer leg, channel shaped anvil plates extending around the outer faces of said top chords with their legs bent to extend under the bottoms of the top chord legs thereby preventing vertical displacement of the plates, the distance between the inner upper faces of the legs of the plates being greater than the distance between the outer faces of the chord legs and sufficient to permit the plates to be applied to the chords while tilted, means applied to one leg of each plate to prevent tilting of the plate sufficiently to remove them from the top chords, stop means fixed on the chord top wall limiting longitudinal movement of the plates, and cushion pads retained between the tops of the plates and the tops of the chords.

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