

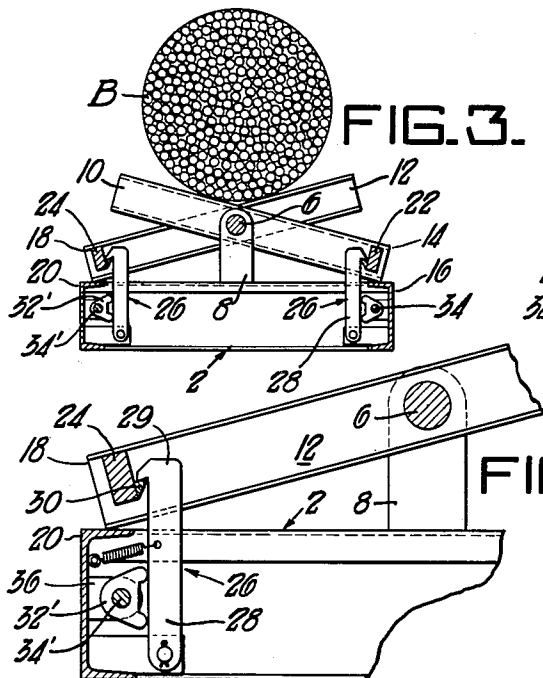
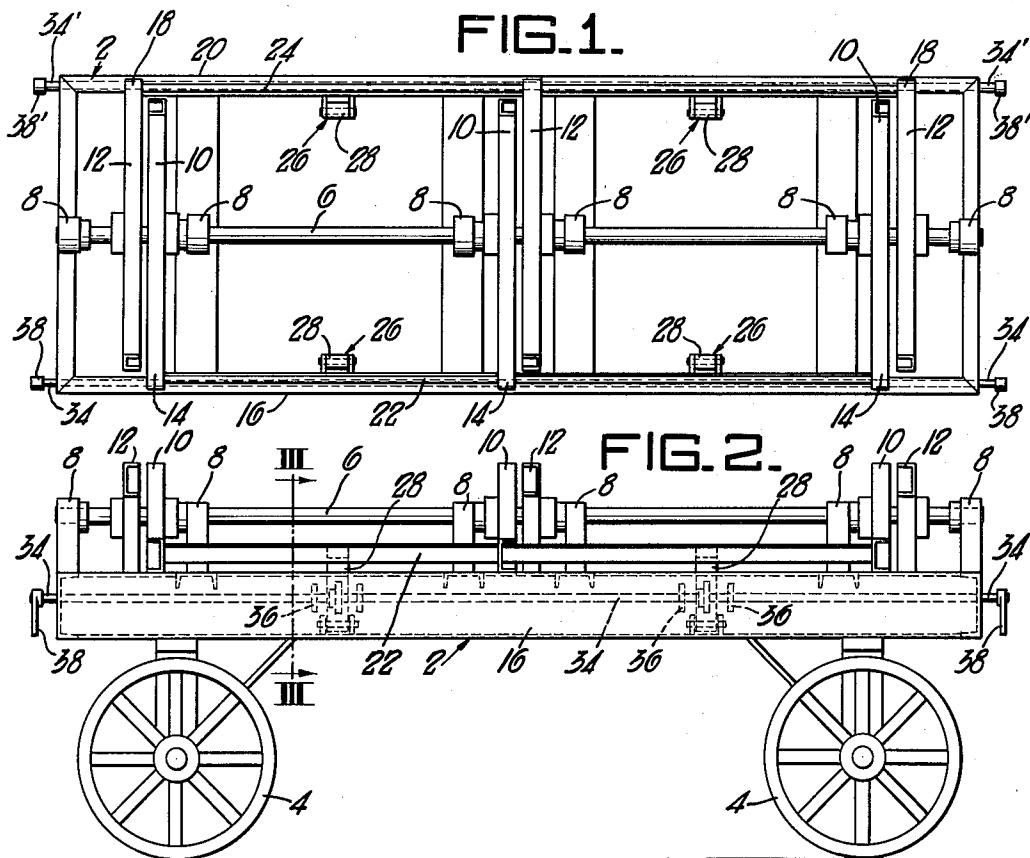
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VEHICLE MOUNTED APPARATUS FOR HANDLING ARTICLES

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VEHICLE MOUNTED APPARATUS FOR HANDLING ARTICLES

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The present invention relates to material handling apparatus and more particularly to an apparatus especially suitable for handling relatively large and heavy articles for loading into a railroad box car.

The present invention finds practical application in the loading of bundles of straightened and cut wire and bars in conventional box cars, and in that application, we shall, in an exemplary way, describe it.

In loading a box car with bundles of straightened and cut wire or bars, the bundles are ordinarily laid side by side in a horizontal position on the floor of the car in a single tier. The bundles are placed in the ends of the car and are positioned with their longitudinal axes extending parallel to the length of the car. Due to the weight of the individual bundles, which may range from two to three tons, and the lengths thereof, which is usually eight or ten feet, considerable difficulty is encountered in handling them in the limited confines of a conventional railroad box car. Prior to our invention, a conventional boom type tractor was used to lift the bundles through the door of the box car and swing them into the ends of the car. The use of the boom type tractor was not fully satisfactory since the clearances of the door and the car itself were not sufficient to permit free manipulation of the tractor. Because of the limited operation of the tractor, the bundles could not be placed in their desired locations by means of the tractor alone. As a result, it was necessary for workmen using crow bars to manually force the bundles into their proper positions after they had been deposited on the floor of the car by the tractor. This combination of tractor and manual labor proved unsatisfactory in that the practice created unsafe working conditions and was costly due to the excessive time required to load a car.

It is, accordingly, an object of our invention to provide an apparatus for handling heavy elongated articles whereby the articles may be quickly and safely transported into a box car or the like and deposited therein in any desired arrangement.

This and other objects will become more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a plan view;

Figure 2 is a side elevational view;

Figure 3 is a cross sectional view taken on the line III—III of Figure 3;

Figure 4 is a view similar to Figure 3 showing the apparatus in discharging position; and

Figure 5 is an enlarged detail view of Figure 3 showing the details of the latching mechanism of the apparatus.

Referring more particularly to the drawings, reference numeral 2 indicates a rectangular box-like frame which may be mounted in conventional manner on two pairs of wheels 4 which may be made of cast steel or the like. If desired, one pair of the wheels may be pivotally connected to the frame to facilitate maneuvering of the apparatus. The frame may be mounted on the wheels in such a manner that its sides project laterally slightly be-

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yond the wheels in order to eliminate possibility of damage to the wheels by articles dropped from the frame. A shaft 6 is rigidly supported in a central position lengthwise and above the frame 2 by means of pairs of bearings 8 which are connected to and extend upwardly of the frame. A pair of support arms 10 and 12 are rotatably mounted on the shaft 6 intermediate each pair of bearings 8. Each of the arms 10 and 12 is mounted in slightly off-center position on the shaft 6 as best shown in Figures 3 and 4. The arrangement of each pair of arms on the shaft is such that in supporting position the longer portion 14 of each arm 10 extends downwardly toward one side 16 of the frame 2 while the longer portion 18 of each arm 12 extends downwardly toward the opposite side 20 of the frame when the apparatus is in normal supporting position.

The outer end of the portion 14 of each of the arms 10 is rigidly fastened, by suitable means, to a common longitudinally extending bar 22, which may be metal, while the corresponding ends of the arms 12 are each similarly fastened to a common longitudinally extending bar 24. The attachment of support arms 10 and 12 to bars 22 and 24, respectively, assures positive unified movement of these arms when pivoting about shaft 6.

Support arms 10 and 12 are locked in load receiving and supporting position, as best shown in Figure 5, by means of latching mechanisms 26, one or more of which may be mounted along the length of each of the sides 16 and 20 on the inner surfaces thereof. Each of the latching mechanisms 26 includes a spring loaded dog 28 pivotally mounted at its lower end on the inner surface of the side of the frame. Each of the dogs is provided with a hook shape upper end 29 which engages with a lip portion 30 on the bars 22 and 24 to latch the bars to the sides of the frame and hold the arms 10 and 12 in load receiving and supporting position.

A cam 32 or 32' is provided in each of the latch mechanisms for releasing the dog 28 from its latching position. The cams 32 adjacent the side 16 of the frame are fixedly mounted on a common shaft 34 which is rotatably supported in bearings 36 on the inner surface of side 16 and extends the full length of the frame 2 and projects from the two ends thereof. The projecting ends of the shaft 34 are provided with handles 38 so that the shaft may be easily rotated to release the latching mechanisms on the side 16 of the frame simultaneously. The cams 32' of the latch mechanisms on the opposite side 20 of the frame are similarly mounted on a shaft 34' having handles 38' on its projecting ends. Thus either arms 10 or 12, as desired, may be released from load supporting position by turning either of the handles 38 or 38' to release bar 22 or 24, respectively. When either bar is released, the weight of the load will cause the arms to which the released bar is attached to pivot upwardly and assume a position parallel with the arms fastened to the latched bar which is not released. In this position, the arms provide inclined skids or runways whereby the load rolls or falls off the apparatus or truck. The off-center positioning of the arms 10 and 12 and the weights of the bars 22 and 24 cause the arms 10 or 12 to automatically return to their load supporting positions where the lips 30 are again engaged by the spring loaded dogs 28 after the load has dropped from the truck.

In operation, a load which is represented as a bundle "B" of straightened and cut wire, is deposited on the apparatus by means of a crane or lift hoist (not shown). The bundle is positioned on the truck in the cradle formed by the intersections of each pair of arms 10 and 12 in supporting position as shown in Figure 3. The truck is then rolled into the box car to be loaded and is positioned lengthwise of the car adjacent the location on the floor of the car where it is desired to position the bundle.

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The bundle is then caused to be discharged onto the floor of the car by rotating the proper shaft 34 or 34', depending on which side of the truck it is desired to deposit the bundle. As best shown in Figure 4, when either of the bars 22 or 24 is released, the weight of the bundle causes the released bar to pivot upwardly which moves the arms connected to the released bar to simultaneously move to a position parallel with the arms fastened to the unreleased bar. Thus the support under one side of the bundle is removed and the bundle drops from the truck.

To load the floor space taken up by the truck, it is only necessary to discharge one or two bundles onto the top of previously positioned adjacent bundles, remove the truck from the car, and then roll the last loaded bundle or bundles onto the floor in the space previously occupied by the truck.

It will be noted that the latching mechanisms are arranged to be operated from the side of the apparatus opposite to that from which the bundle is discharged so that the operator is not exposed to danger of injury from the falling load.

In loading a box car with the bundles of straightened and cut wire or bars, the bundles are necessarily loaded in single tiers in each car since the combined weights of the bundles would cause a car to be overloaded as to its weight capacity if more than one tier were loaded therein. However, it is not intended to convey the impression that use of the apparatus of our invention is restricted to loading only one tier of articles in a box car or the like since it obviously may be used for loading bundles in more than one tier. The height of the frame 2 from the floor of the box car or other carrier being loaded may be varied by changing the diameter of the wheels on which the frame is mounted to accommodate other dimension loads and numbers of tiers.

While one embodiment of our invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

We claim:

1. Apparatus for handling an article comprising a wheel mounted rectangular frame, a shaft rigidly mounted on said frame extending above and lengthwise of the same intermediate the sides thereof, at least two pairs of supporting arms pivotally mounted in spaced relation along said shaft, each of said pairs including a first and second arm each pivotally mounted intermediate its ends on said shaft, one end of each of said first arms being rigidly connected with a first common bar extending lengthwise of said frame, one end of each of said second arms being rigidly connected with a second common bar

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extending lengthwise of said frame, at least one latch connected with each side of said frame for releasably latching said bars to opposite sides of said frame, the free ends of said arms forming a V shape cradle for supporting an article when said bars are latched to said frame, and means mounted on said frame in operative association with each of said latches for selectively releasing one of said bars, the arms attached to said released bar being adapted to pivot under the weight of an article supported on said cradle to a position parallel with the arms attached to the unreleased bar to discharge said article from said cradle.

2. Apparatus for handling an article as defined by claim 1 characterized by said frame being mounted on at least two pairs of wheels, at least one of said pairs of wheels being pivotally connected to said frame.

3. Apparatus for handling an article as defined by claim 1 characterized by the portion of each of said arms from said shaft to its respective connecting bar being greater in length than the portion thereof from said shaft to its free end.

4. Apparatus for handling an article as defined by claim 1 characterized by each of said latches including a spring loaded dog pivotally mounted by one end to the side of said frame, said dog having a hook shape at its free end for releasably engaging one of said bars.

5. Apparatus for handling an article as defined by claim 4 characterized by each of said releasing means including a shaft rotatably mounted lengthwise along one side of said frame with at least one end thereof projecting from one end of said frame, and a cam member rigidly mounted on said shaft adjacent to and in contact with each of said dogs, each of said cam members being adapted to pivot said dog away from the side of said frame to disengage said hook shape end from said bar when said last named shaft is rotated.

6. Apparatus for handling an article as defined by claim 5 including a handle on the projecting ends of said rotatable shafts for manually rotating the same.

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