March 23, 1965 K. W. TANTLINGER ETAL 3,174,630

CONTAINER HANDLING APPARATUS

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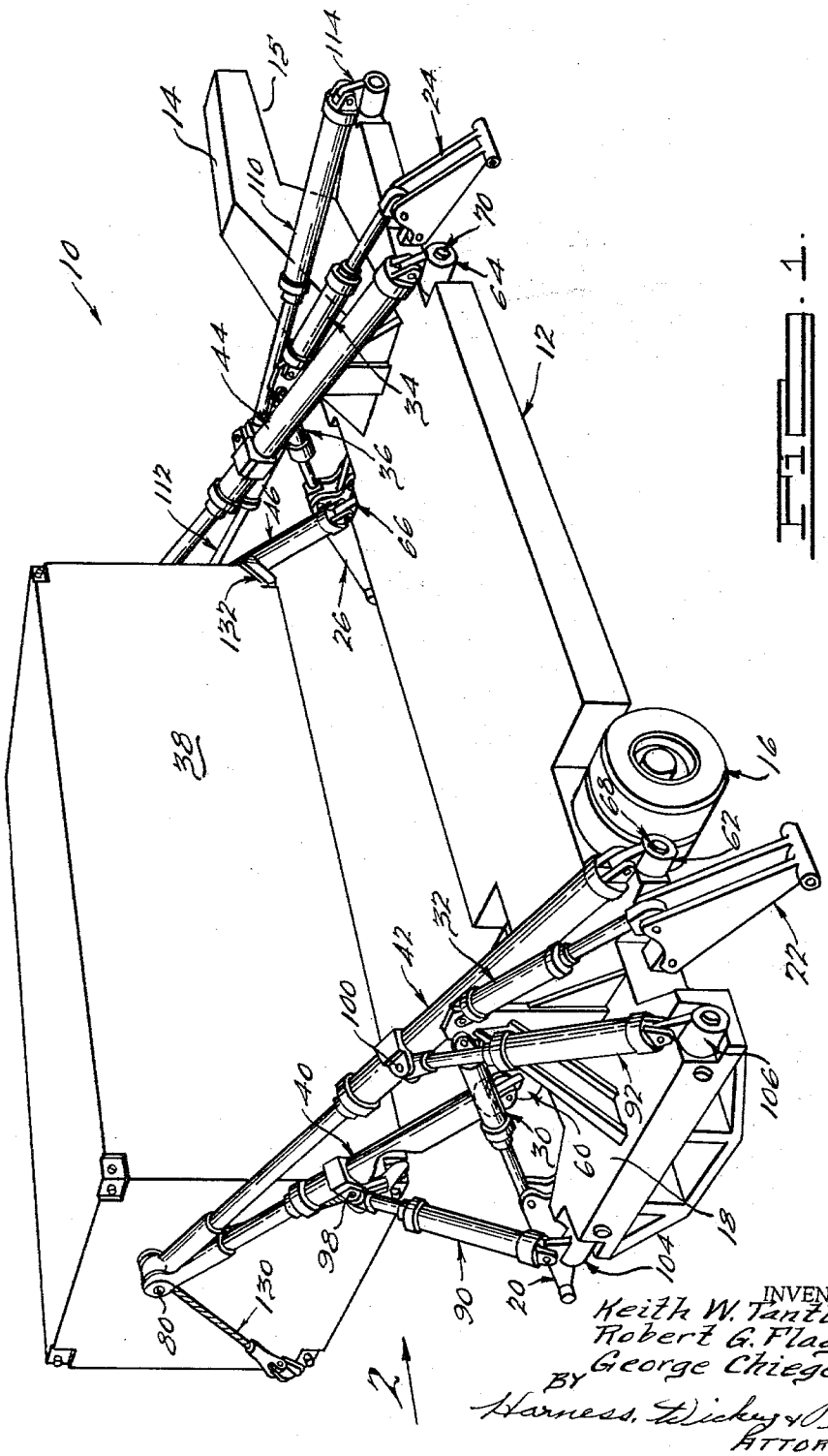


FIG. 1.

INVENTORS.
Keith W. Tantlinger,
Robert G. Flagan,
George Chieger.
BY
Harness, Dickey & Pierce
ATTORNEYS.

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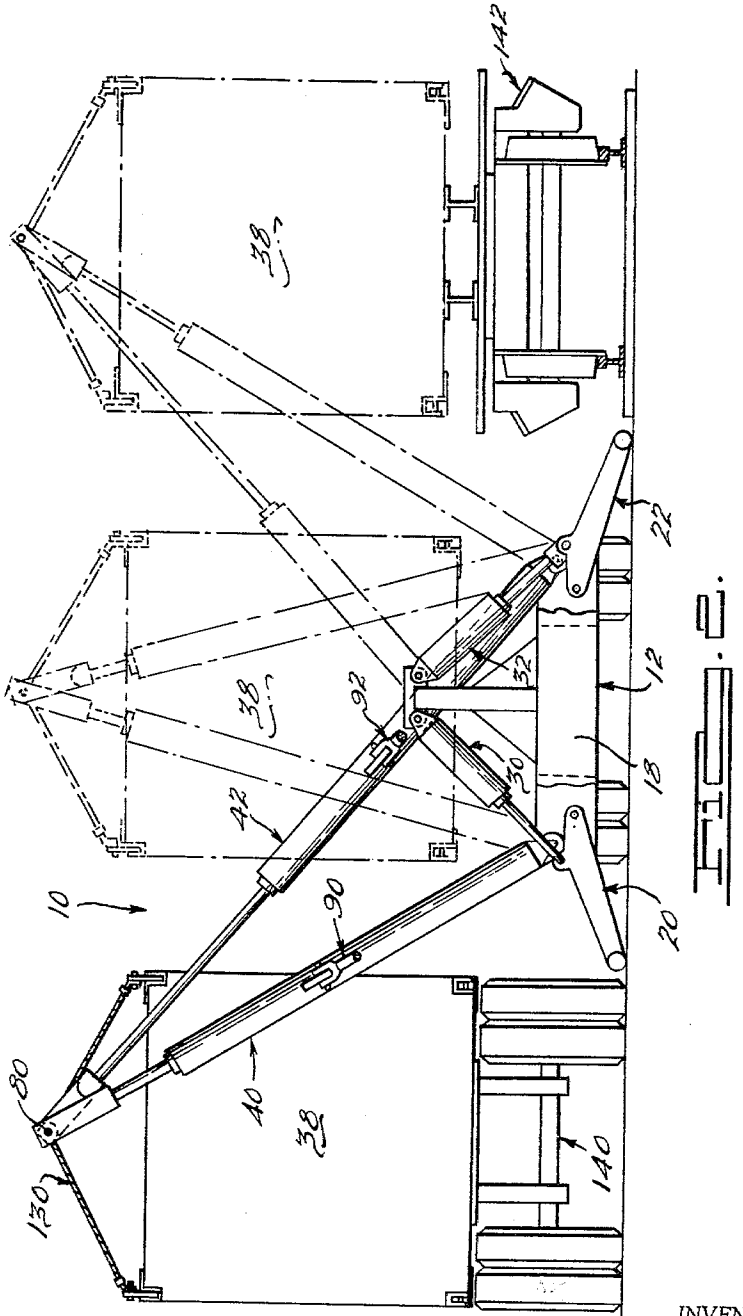


Fig. 2

INVENTORS.
Keith W. Tantlinger,
Robert G. Flagan,
George Chieger.
BY
Harness, Dickey & Pierce
ATTORNEYS.

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3,174,630
CONTAINER HANDLING APPARATUS

Keith W. Tantlinger, Grosse Pointe Shores, Robert G. Flagan, Grosse Pointe Park, and George Chieger, Grosse Pointe Woods, Mich., assignors to Fruehauf Corporation, a corporation of Michigan

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1 Claim. (Cl. 212—8)

This application relates generally to material handling equipment and more particularly to an improved container handling apparatus.

The advent of the multipurpose shipping container has simplified the transfer of goods to the point that currently available handling apparatus is often inefficient and in many cases totally unsatisfactory. For example, the use of shipping containers has created the need for improved handling apparatus capable of expediting the transfer of such shipping containers from, for example, highway vehicles to rail cars. Such handling apparatus should be relatively flexible so as to be capable of handling shipping containers of different configuration. Further, such handling appartus should be easily movable to a loading site.

These requirements are satisfied by the container handling apparatus of the instant invention, by the utilization of spaced pairs of booms that are easily adjustable to accommodate containers of different size and configuration thereby maximizing flexibility of the handling apparatus. The booms are synchronized in such a manner that containers need be lifted only to vertically clear the vehicles between which transfer is taking place, the containers traversing a substantially horizontal path between the vehicles. The apparatus is completely portable thereby obviating the need for separate handling equipment at each loading site.

Accordingly, one object of the instant invention is an improved container handling apparatus.

Another object is an improved means for transferring shipping containers between spaced vehicles.

Another object is an improved transfer apparatus that effects movement of a shipping container in substantially a horizontal path.

Another object is a twin boom container handling apparatus.

Another object is a vehicalized container handling apparatus.

Another object is a container handling apparatus that is relatively easily adapted to accommodate containers of varying size and configuration.

Other objects and advantages of the instant invention will be apparent in the following specification, claim and drawings wherein:

FIGURE 1 is a perspective view of a container handling apparatus in accordance with an exemplary embodiment of the instant invention shown in operative association with a shipping container; and

FIGURE 2 is a view taken substantially in the direction of the arrow 2 of FIGURE 1 showing the shipping container at an initial, an intermediate position, and at a terminal position.

As best seen in FIGURE 1 of the drawings, a container handling apparatus 10, in accordance with an exemplary embodiment of the instant invention, comprises a platform 12 having a gooseneck 14 at one end thereof with a downward depending kingpin 15 to facilitate attachment to a conventional tractor (not shown). The platform 12 has a plurality of road-contacting wheels 16 at an opposite end 18 thereof to facilitate highway travel. The platform 12 is of relatively heavy construction with concrete or the like so as to function as ballast for the handling apparatus 10.

The platform 12 is provided with a plurality of downwardly extendable ground contacting stabilizing arms 20, 22, 24 and 26 that are pivotally coupled to the platform 12. The arms 20, 22, 24 and 26 are rotatable to the ground-engaging condition by a plurality of hydraulic actuators 30, 32, 34 and 36, respectively. When the arms 20, 22, 24 and 26 are rotated to the ground-engaging condition, the platform 12 is stabilized against rotation about its longitudinal axis to facilitate lateral movement of a shipping container, 38 as will be described.

In accordance with the instant invention, longitudinally spaced pairs of container supporting booms 40–42 and 44–46, in the form of hydraulic cylinders, are pivotally coupled to a like plurality of knuckles 60, 62, 64 and 66 on the platform 12. The knuckles 60, 62, 64 and 66 are supported for rotation about axes extending laterally of the platform 12 on complementary pins, two of which are shown and designated by the numerals 68 and 70. Thus, the booms 40–42, and 44–46 are rotatable about axes that extend substantially parallel to the longitudinal axis of the platform 12 as well as about axes extending laterally of the platform 12.

The booms 40–42 and 44–46 are joined at their upper ends by pins one of which is shown and designated by the numeral 80. Thus, it will be seen that the booms 40–42, and the booms 44–46 form triangles the sides of which are extendable and the base of which comprises the platform 12.

The rotative position of the booms 40–42 about the lateral axis of rotation thereof is controlled by a pair of hydraulic cylinders 90 and 92 that are pivotally coupled to the booms 40 and 42, respectively. The cylinders 90 and 92 are also pivotally coupled to the rear end portion 18 of the platform 12 by knuckles 104 and 106 that are journaled for rotation about axes extending laterally of the platform 12.

Similarly, the front booms 44 and 46 are controlled for rotation about an axis extending laterally of the platform 12 by a pair of hydraulic cylinders 110 and 112 that are pivotally coupled to the platform 12 as by complimentary knuckles, one of which is shown and designated by the numeral 114.

The container 38 which is of conventional construction, is suspended on suitable bridles 130 and 132 having conventional coupling apparatus for engagement with, for example, suitable pins (not shown) at the lower corners of the container 38, as in FIGURE 1 or at the upper corners of the container 38 as in FIGURE 2. The bridle 130 is pivotally connected to the upper end portions of the booms 40–42 and the bridle 132 to the upper end portions of the booms 44–46 so that the container 38 is pendently maintained in the horizontal condition upon movement thereof laterally of the handling apparatus 10.

As best seen in FIGURE 2 of the drawings the container 38 is first coupled to the bridles 130 and 132 whereupon the booms 40–42 and 44–46 are extended effecting elevation of the container 38 and conditioning the container for movement laterally of the supporting vehicle, for example, a highway trailer 140. Lateral movement of the container 38 is effected by controlling the rate of flow of hydraulic fluid to the booms 40–42, 44–46 as well as to the stabilizing cylinders 90–92, 110–112. It should be obvious that programming of the fluid flow to the aforementioned hydraulic actuators can be predetermined by conventional control apparatus thereby to effect movement of the container in substantially a horizontal direction. As seen in the right hand portion of FIGURE 3 of the drawings, the container 38 has been deposited on a rail car 142.

It is to be understood that the specific construction of the improved Container Handling Apparatus herein disclosed and described is presented for the purpose of

examination and illustration and is not intended to indicate limitation of the invention, the scope of which is defined by the following claim.

What is claimed is:

Container handling apparatus comprising;

an elongated generally rectangular platform,

means for stabilizing the platform against rotation about the longitudinal axis thereof,

a first pair of main hydraulic rams, each having lower cylinder portions universally coupled to said platform in transverse spaced relationship inwardly of one end of said platform, and each of said rams having an upper piston rod, said rods being pivotally coupled to one another,

a first pair of stabilizing hydraulic cylinders extending between the lower cylinder portions of said first pair of rams and said one end of said platform, respectively, for stabilizing said first pair of rams against rotation about an axis extending transversly of said platform,

a second pair of main hydraulic rams, each having lower cylinder portions universally coupled to said platform in transverse spaced relationship inwardly of the opposite end of said platform from said one

end thereof, and each of said rams having an upper piston rod, said rods being pivotally coupled to one another,

a second pair of stabilizing hydraulic cylinders extending between the lower cylinder portions of said second pair of rams and said opposite end of said platform for stabilizing said second pair of rams against rotation about an axis extending transversly of said platform, and

a pair of bridles engageable with the coupled upper end portions of the piston rods on said first and second pairs of main hydraulic rams, respectively, for suspending the container from said main rams.

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SAMUEL F. COLEMAN, *Acting Primary Examiner.*

ANDRES H. NIELSEN, *Examiner.*