

[54] **SYSTEM AND APPARATUS FOR HOLDING FREIGHT CONTAINERS OF VEHICLES AND THE LIKE**

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[51] Int. Cl. ....**B65g 67/02**

[58] Field of Search.....**214/38 CC, 38 CA; 105/366 B, 105/366 C, 376**

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[57] **ABSTRACT**

Apparatus for locating and holding freight containers to the flat deck of a vehicle, such as a railway car, truck, trailer and the like. The containers may be of various lengths and may be intermixed on the deck of the vehicle and are located on the deck of the vehicle by interengaging dome and socket connections and latch bolts locking the domes to the sockets. The latch bolts are released by the lifting devices of a conventional lift for lifting and placing containers on vehicle decks. In one form of the invention, upward movement of the lifting device releases the latch bolts. In another form of the invention, inward movement of the lifting devices to engage under the container, serves to release the latch bolts and accommodate the container to be lifted above the deck of the vehicle.

**5 Claims, 10 Drawing Figures**

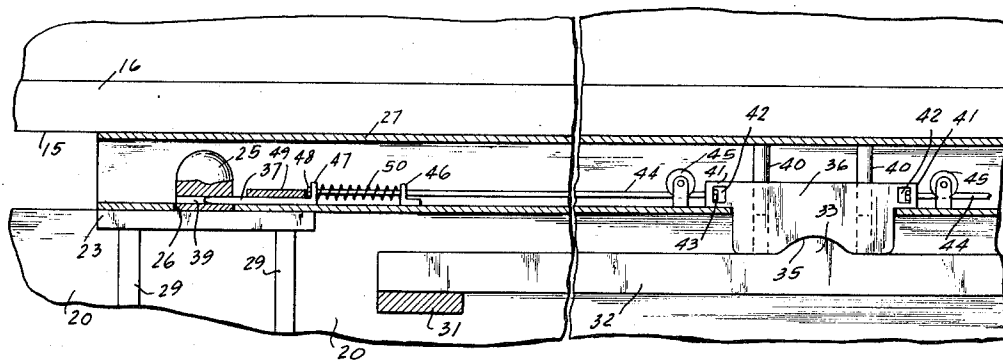
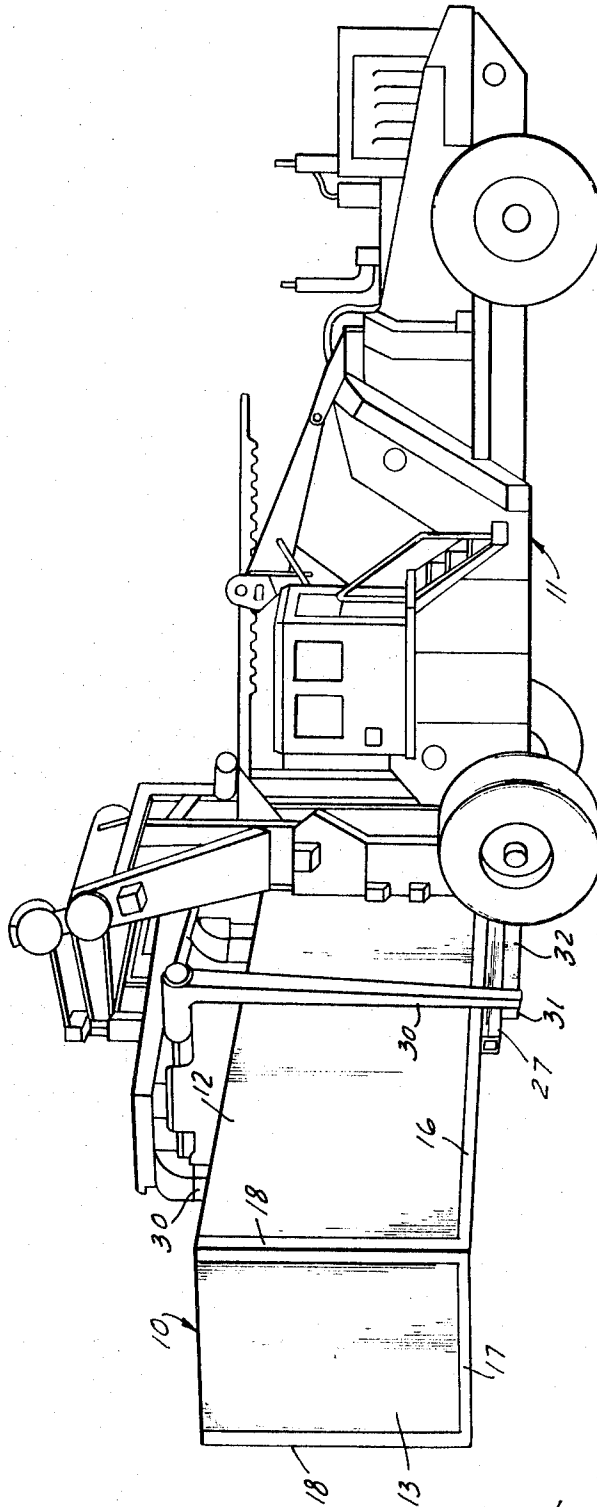




FIG. 3



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FIG. 4

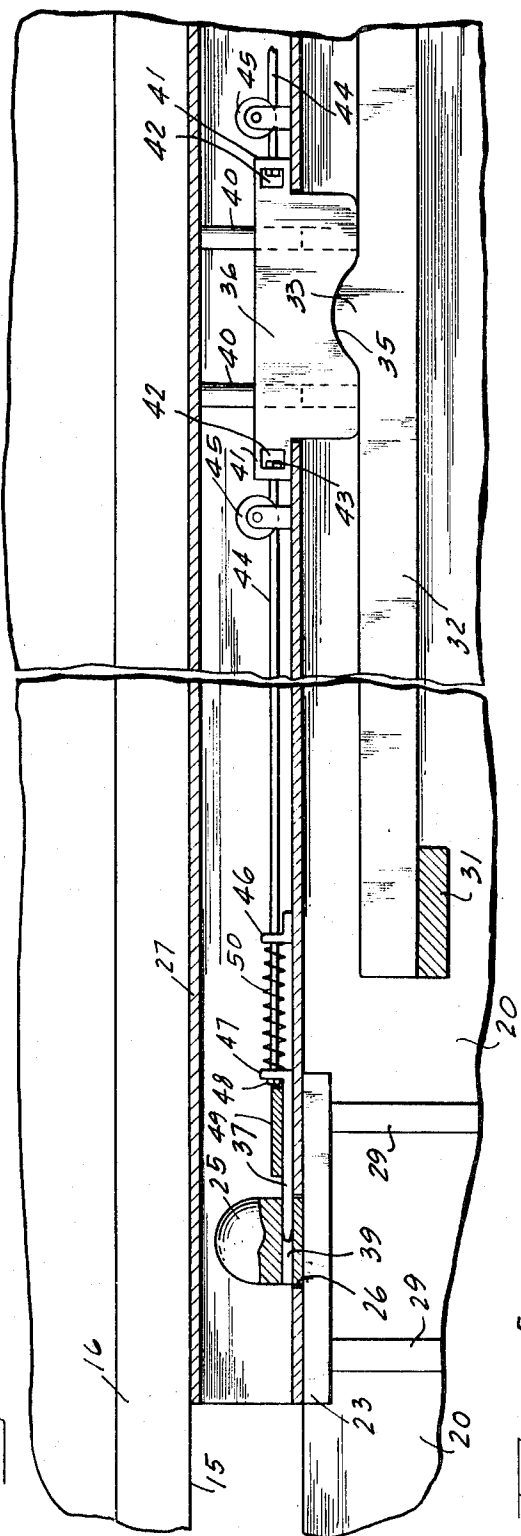
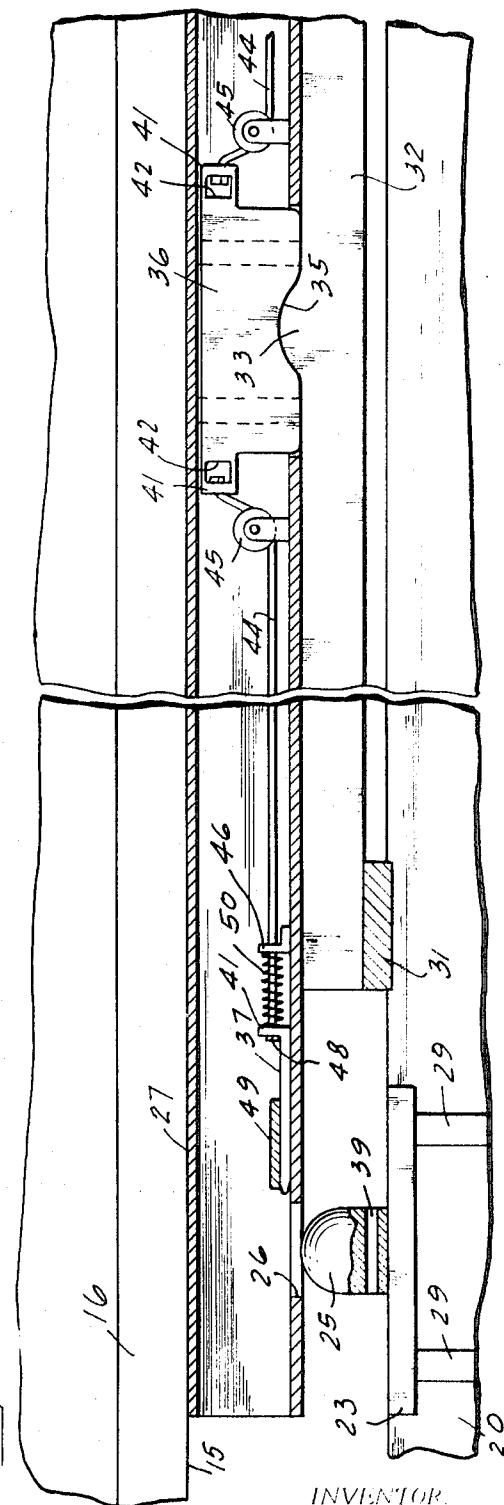


FIG. 5



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FIG. 6

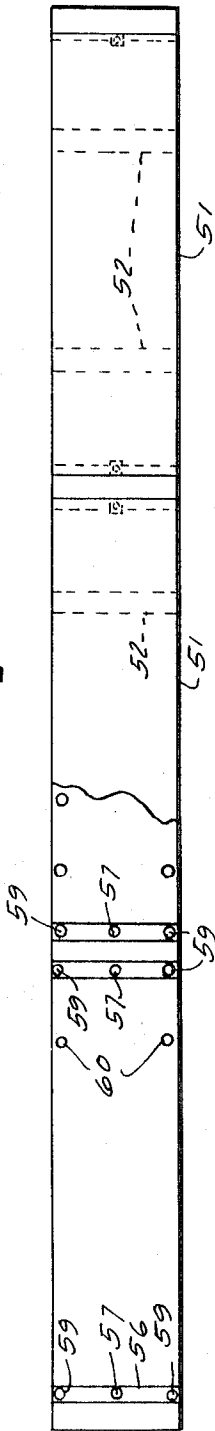


FIG. 7

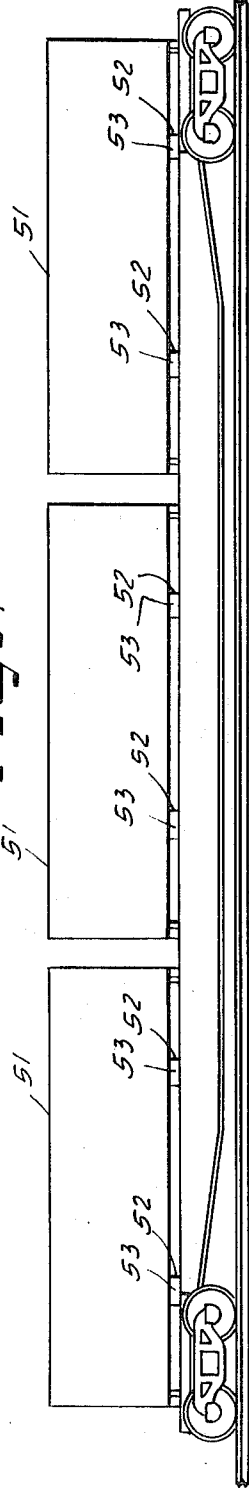
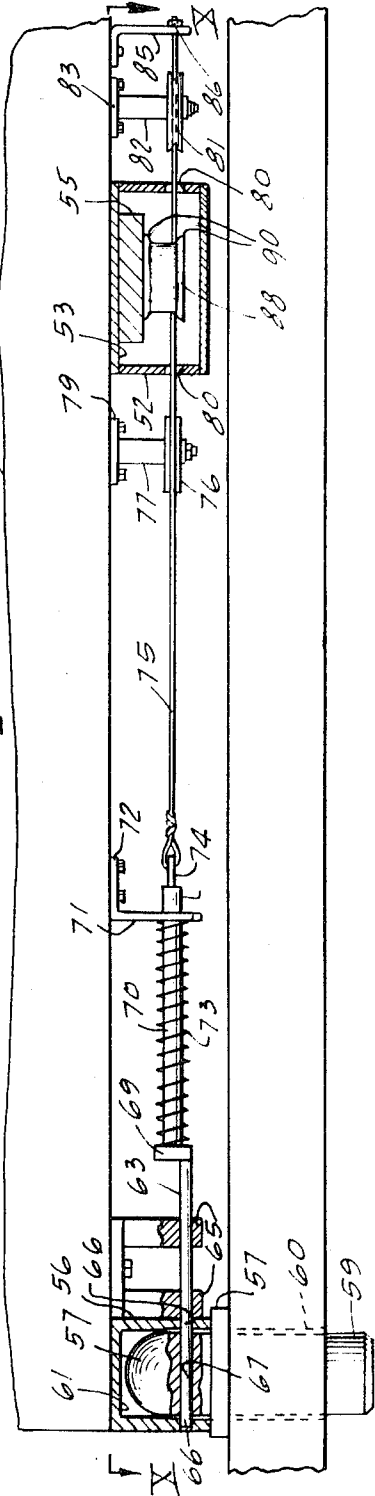


FIG. 8



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FIG. 9

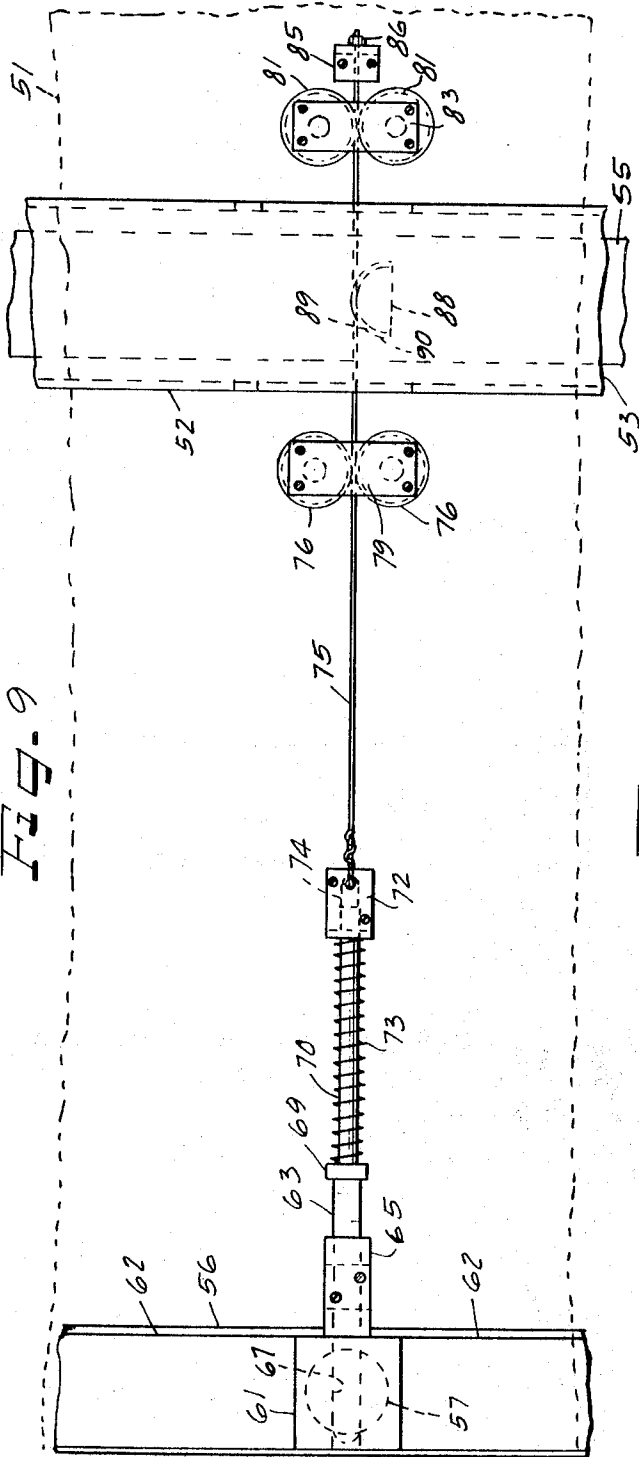
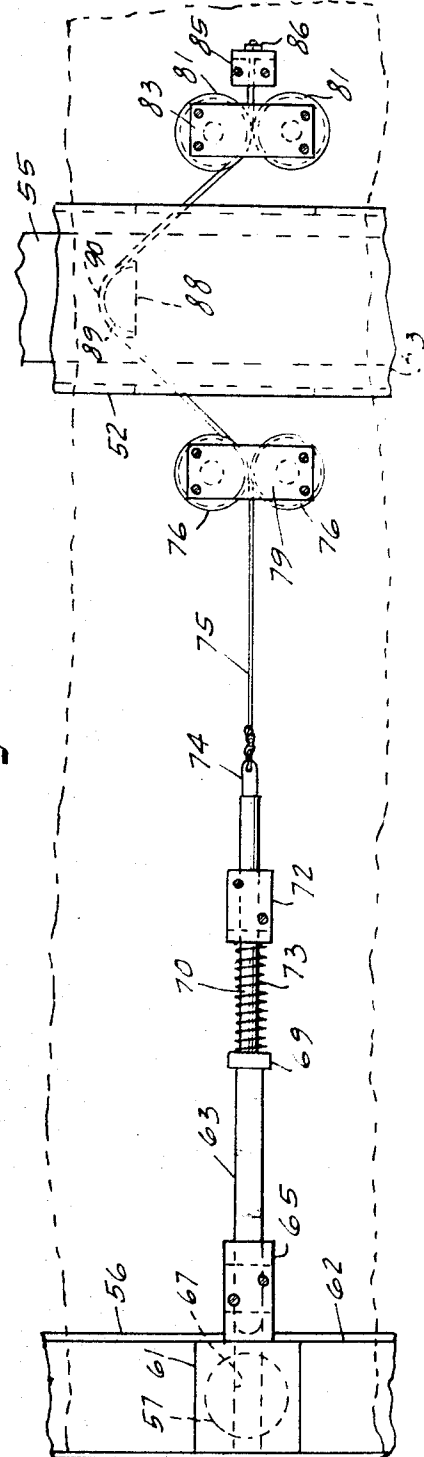


FIG. 10



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## SYSTEM AND APPARATUS FOR HOLDING FREIGHT CONTAINERS OF VEHICLES AND THE LIKE

### SUMMARY AND OBJECTS OF THE INVENTION

The present invention is to provide a simple form of container locking and registering device for locking a container to the deck of a vehicle in the form of a series of equally spaced projecting and centering devices registering with sockets on the container, in which the devices are released by the lift forks of lifting devices for lifting the container onto and from the deck of a vehicle.

A principal object of the present invention is to provide an improved system and apparatus for locating and locking freight containers to vehicle decks arranged with a view toward accommodating the release of the apparatus by the lift forks of a lifting device, lifting the apparatus above a vehicle deck and holding the apparatus in a released position as long as the lifting apparatus is in position to lift or lower the container.

A further object of the invention is to provide the novel system and apparatus for retaining containers to vehicle decks, in which locating and locking devices are spaced along the vehicle deck in such a manner that various lengths of containers may be loaded on a vehicle deck without altering the vehicle, in which the locating and locking devices are released by the lifting devices, lifting and lowering the containers.

A still further object of the invention is to provide a dome and socket locating and locking system for locking containers to vehicle decks in which the domes are positively locked to the sockets by releasable latch bolts and the latch bolts are released by engagement of the operating mechanism therefor with lifting devices for lifting and lowering the containers onto the deck of the vehicle.

Other objects, features and advantages of the invention will be readily apparent from the following description of certain preferred embodiments thereof, taken in conjunction with the accompanying drawings, although variations and modifications may be effected without departing from the spirit and scope of the novel concepts of the disclosure.

### DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagrammatic top plan view of a railway car adapted to transport containers of varying lengths in accordance with the principles of the present invention, and showing two containers in broken lines and supported on the deck of the car.

FIG. 2 is a diagrammatic view in side elevation of the railway car shown in FIG. 1 showing the containers in solid.

FIG. 3 is a diagrammatic perspective view illustrating a container lifting device in the process of lifting a container, constructed in accordance with the principles of the present invention.

FIG. 4 is a diagrammatic fragmentary side elevational view of the container and a part of the railway car shown in FIGS. 1 and 2 with certain parts shown in longitudinal section in order to illustrate the locating and locking means of the present invention and the release means therefor, and showing the container in a locked position on the deck of a railway car.

FIG. 5 is a diagrammatic view somewhat similar to FIG. 4, but showing the container in the process of being lowered onto the deck of a railway car, with the locating and latching devices in released positions.

FIG. 6 is a fragmentary plan diagrammatic view of a railway car, showing a series of containers supported on the deck of the car with certain of the containers broken away.

FIG. 7 is a diagrammatic view in side elevation of the railway car shown in FIG. 6 with containers supported on the deck of the car in accordance with the principles of the present invention.

FIG. 8 is a diagrammatic partial fragmentary longitudinal sectional view taken along the bottom of the container illustrating the principles of locating and locking the container to the deck of a railway car.

FIG. 9 is a diagrammatic partial fragmentary sectional view taken substantially along line IX—IX of FIG. 8; and FIG. 10 is a diagrammatic view somewhat similar to FIG. 9 but showing the latching device in released position.

### DESCRIPTION OF PREFERRED EMBODIMENTS OF INVENTION

In FIGS. 1 to 6 of the drawings, I have shown a series of freight containers 10 of a type adapted to be transported by railway flat cars, trailers, trucks, ships and the like, and have shown in FIG. 3 a side lift tong truck 11 backed up along one side of a container 10 in lifting engagement with the container, to lift the container and lower it onto a railway car, trailer, flatbed trailer, or other freight transporting vehicle.

The container 10 is of a generally rectangular box-like form and may be of various selected lengths and of widths substantially equal to the width of a railway car or trailer. Said container has a closed top, parallel side walls 12, end walls 13 connecting the side walls together and a bottom wall 15. The bottom, side and end walls of the container are usually made from a relatively thin metal skin secured to and reinforced by a supporting and reinforcing frame structure including bottom side beams 16, end beams 17 connecting said side beams together and corner posts 18 extending upwardly of the side and end beams along the corners of the container to the tops of the side and end walls 12 and 13. One or both of the end walls 13 may have doors therein (not shown) extending for substantially the width of the container to accommodate the container to be loaded from an end thereof.

A railway car 19 is shown in FIGS. 1 and 2 as having a center sill 20 extending for the length of the car, flat platforms 21 on a level with the top of the sill, at opposite ends of said sill, and transverse locating and support beams 23 spaced along said sill and extending in opposite directions from said sill and forming supports for upwardly projecting locating and locking members 25. The locating and locking members 25 are shown in FIGS. 5 and 6 as being in the form of domes having spherical heads, but may have conical, frusto-conical or various other desired forms of heads, which will locate the container 10 on the railway car. The locating and locking members 25 fit within downwardly opening sockets 26 opening in the bottoms of hollow beams 27. The hollow beams 27 extend along the bottom of the container along opposite sides thereof and afford a support for the container on the railway car. The transverse platforms 23 are in the form of beams braced to opposite sides of the center sill 20 as by gussets 29 extending from said center sill beneath said platforms and welded or otherwise secured thereto.

The side lift truck 11 may be of any conventional form and is illustratively shown as including depending lift tongs 30 extending downwardly along opposite sides of the container. The lift tongs 30 have lift forks 31 extending inwardly of the container for engagement along the bottoms of the beams 27. Said lift forks are connected together by a lift bar 32 having an upwardly extending uniformly curved abutment 33 intermediate its ends, for engagement with a downwardly facing recess or socket 35 in the bottom of a release member 36. Upward lifting movement of the tongs 30 moves the release members 36 to move latch bolts 37 out of registry with the sockets 26 and latch passageway 39, shown as extending for the length of the associated locating and locking member 25. In certain forms of container lift trucks, the lift bars 32 may be detachably mounted on the inner ends of the lift forks 31 in a suitable manner.

It should here be understood that the opposite lift tongs 30 extending along opposite sides of the container from the side shown have tines or forks 31 extending inwardly therefrom, having a lift bar 32 extending thereacross for releasing latch bolts 37 from locating and locking members 25 and operating in the same manner as the lift bars previously described. It should further be understood that sockets 26 and latch bolts 37 are provided at opposite ends of the hollow beam 27 and

are spaced equal distances from the center of the release member 36.

The release member 36 is of an elongated generally block-like form guided for vertical movement along parallel spaced rods 40 depending from the underside of the top wall of the beam 27 and suitably secured thereto. Said release member has ears 41 extending from opposite ends thereof and limiting downward movement of said release member relative to the hollow beam 27. The ears 41 also afford a means for the attachment of operating members for the linkages, for releasing the latch bolts 37.

As shown in FIGS. 4 and 5, each ear 41 has a rectangular open portion 42 affording access means for a nut or other fastening device 43, connecting a latch bolt release linkage thereto. The latch bolt linkage is herein shown as being in the form of a flexible cable 44, but may be of various other forms. The flexible cables 44 extend in opposite directions from the ears 41 under sheaves 45. The left-hand flexible cable 44 extends from its sheave 45 through a guide member 46 projecting upwardly of the bottom wall of the beam 27 and through an upright leg 47 of the latch bolt 37, and is secured to said leg as by a nut 48 or other suitable fastening device. The latch bolt is guided along a guide 49 extending upwardly of the bottom plate of the beam 27 for movement into engagement with the latch passageway 39. A spring 50, shown as being a compression spring extends along the flexible cable 44 and is interposed between the legs 46 and 47 to bias the latch bolt into its locking position.

It is apparent from the foregoing that as long as the lift bar 32 is in engagement with the undersurface of the beam 27 and the abutment 33 is in engagement with the socket 35, the latch bolts 37 at opposite ends of said beam will be held in released positions by the release member 36, shown in FIG. 5 as being in its upper limit of travel. As the latch bolts 37 are released from the locking and locating members 25, the container may be lifted from the vehicle by the lift tongs 30 or may be placed onto another vehicle having locking and locating members 25 like those shown in FIGS. 4 and 5, and centered relative to the vehicle upon lowering movement of the lift tongs 30 and lift bars 32. The container may then be locked in position as the lift bar 32 is lowered to accommodate the springs 50 to engage the latches 37 within the latch openings 39 extending along the locating and locking members 25 and to move the release member 36 downwardly into the position shown in FIG. 4.

It should be understood that the hollow beams 27 may be of two-piece constructions to afford access to the release members 36 and the cables 44, springs 50 and latch bolts 37, or may have suitable openings therein, to enable ready access to the latching and release parts carried within said beams. It should further be understood that the release members 36 may operate mechanical linkages in place of the flexible linkages shown, and that various release means for the latch bolts other than the means herein shown may be used without departing from the spirit and scope of the present invention.

It should further be understood that the locating and locking members 25 and transverse beams 23 may be positioned in various locations along the car to take care of various lengths of containers without altering the car. As for example, the locating members 25 may be so located as to take care of two 10 foot containers and one 20 foot container or a 30 foot container and a 10 foot container or one 40 foot container or other containers of various lengths dependent upon the length of the car.

In FIGS. 6 to 10 of the drawings, I have shown a securement system for securing containers to the deck of a flat car or flatbed vehicle, which is actuated by horizontal inward movement of lift forks of a tong type container lifting apparatus to come into engagement with the bottom of the container. In this form of the invention, containers 51 have spaced beams 52 extending across the bottoms thereof and shown in FIG. 9 as being box-like hollow beams fabricated by welding or in any other suitable manner, to provide fork openings 53, for forks 55 of a container lifting apparatus similar to that shown in

FIG. 3, but in which the forks move inwardly in rectilinear horizontal directions into the fork openings to engage beneath and lift the container from its transporting vehicle.

As shown in FIGS. 6 to 10, a base plate 56 is provided having an upwardly projecting locating and locking member 57 shown as being in the form of a dome extending upwardly of its center, but which may be of various other suitable forms. The base plate 56 extends for the entire width of the car, and has relatively large diameter shafts or pins 59 depending from its opposite ends, which may extend through apertured portions or hollow tubes 60 spaced along the deck of the car on opposite sides thereof and extending beneath the deck of the car. The base plates 56 and shafts or pins 59 may be located in the tubes 60, as required, to support containers of various pre-selected lengths. The dome 57 is engageable within a downwardly opening rectangular socket 61 in centered relation with respect to the longitudinal center line of the container and depending therefrom. Beams 62 extend from opposite sides of the socket into abutting engagement with the base plate 56 when the container is in position on the deck of the flat car.

A latch bolt 63 is guided in spaced guide legs 65 depending from the bottom of the container to engage within apertured portions 66 in opposite walls of the socket 61 and to extend through a latch passageway 67 extending through the dome 57, to lock the container in position in much the same manner as in the form of the invention illustrated in FIGS. 1 through 5.

The latch bolt 63 has an upwardly extending abutment member or lug 69 at its inner end from which extends a guide rod 70, guided in a depending leg 71 of a bracket 72 secured to and depending from the bottom of the container. A compression spring 73 extends along the rod 70 and is seated at one end on the lug 69 and at its opposite end on the depending leg 71 of the bracket 72 and biases the latch bolt into locking engagement with the socket 61 and dome 57. The rod 70 has a coupler 74 for a flexible cable 75 at its inner end, forming a part of the release linkage for the latch bolt 63. The flexible cable 75 is shown as being suitably secured to the coupler 74 and extends inwardly therefrom between two parallel spaced guide sheaves 76, on the lower ends of vertical shafts 77, depending from a bracket member 79, secured to the bottom of the container and depending therefrom. From thence the cable extends through slots 80 extending along the central portion of the beam 52 and between a pair of guide sheaves 81 on the lower ends of shafts 82, depending from a bracket member 83, secured to the bottom of the container. The flexible cable 75 then extends through the vertical depending leg of an angle iron 85 secured to the bottom of the container, and is secured thereto as by a nut 86 or any other suitable securing means.

Each lift fork 55 has an abutment 88 welded or otherwise secured to its undersurface and depending therefrom. The abutment 88 has a semi-cylindrical engaging face 89 having rims 90 extending along the top and bottom surfaces thereof. The engaging face 89 is adapted to engage the flexible drive device 75 upon horizontal inward movement of the lift fork 55 along the fork opening. As the lift fork 55 is moved inwardly along the fork opening, formed by the beam 52, the face 89 of the abutment 88 will come into engagement with the flexible cable 75 and move the cable to disengage the latch bolt 63 from the apertured portion 67 of the dome 57, and retain the latch bolt in its released position as long as the lift fork is in position to lift the container.

It is, of course, understood that a latch bolt 63 and socket 61 is at each end of the container in alignment with the longitudinal center line thereof, and that a separate release mechanism for each latch bolt is provided to be operated by each fork of the lifting device as moved inwardly along the fork openings.

Where it is desired to utilize a lifting device in which lift forks extend along opposite sides of the container, one lift fork only need be long enough to come into gripping engagement with the bottom of the container while the opposite lift fork



should be sufficiently long to extend past the center of the container and actuate the latch bolts 63 to release the latch as the lift fork comes into gripping engagement with the bottom of the container.

While I have only shown sockets and domes at the center of the container in this form of the invention, it should be understood that the sockets may be located at the corners of the container, if desired, and that where the lift forks come inwardly along the fork openings 53 from opposite sides of the container, the latches may be released by the individual forks.

It should further be understood that the aligning and locking apparatus of the present invention is effective for loading a wide variety of lengths of containers on a flat car, and as long as the car is provided with sockets or apertured portions for the pins 59, there is no limitation in length or arrangement of containers on the car.

I claim as my invention:

- 1. In a container for freight and the like having a generally flat bottom and parallel side and end walls extending upwardly therefrom,
  - a flat deck vehicle for transporting the container and in combination with a lift fork having forks for lifting the container from and placing the container on the vehicle deck,
  - a pair of parallel spaced hollow beams extending along the bottom of the container for substantially the length thereof,
  - downwardly opening sockets at opposite ends of the container opening through the bottoms of said beams,
  - projecting locking and locating members projecting upwardly of the vehicle deck for registry with said sockets upon the placing of a container thereon,
  - latches guided along the bottom of the container for movement longitudinally thereof into and out of said sockets,
  - said locking and locating members having openings therein adapted to be engaged by said latches to lock the container to the vehicle deck,
  - latch release members guided in said beams for vertical movement relative thereto and normally depending from said beams,
  - flexible drive connections from said latch release members to said latches including cables extending along said beams and connected with said latches at the outer ends of said cables and with said release members at the inner ends thereof, to effect release of said latches upon upward movement of said release members along said hollow beams by upward movement of the lift fork, prior to lifting the container by the lift fork.
- 2. The container of claim 1, wherein springs bias said latches out of registry with said

- sockets and the openings leading through said projecting locating and locking members.
- 3. The container of claim 2, wherein the latch release members have downwardly opening sockets therein spaced beneath the bottoms of said beams when the latches are in their latch positions, wherein the lift forks have lift bars extending thereacross registering with said beams and latch release members, and wherein said lift bars have upwardly projecting abutments thereon engageable with said downwardly open sockets of said release members to effect movement of said release members into release positions upon upward movement of said lift bars toward the bottom of the container.
- 4. In a container for freight and the like having a generally flat bottom and parallel side and end walls extending upwardly therefrom,
  - a flat deck vehicle for transporting said containers and in combination with a lift fork having forks for lifting said container from and placing said container on the vehicle deck,
  - a pair of parallel spaced hollow beams extending across the bottom of the container and having open ends forming access openings for the forks of the lift fork,
  - downwardly opening sockets at opposite ends of the container,
  - projecting locating and locking members projecting upwardly of the vehicle deck for registry with said sockets upon the placing of a container thereon, latches guided along the bottom of the container for movement longitudinally thereof into and out of said sockets,
  - said locating and locking members having openings therein adapted to be engaged by said latches to lock the container to the vehicle deck,
  - individual flexible cables connected with said latches and extending transversely through said beams,
  - means securing the opposite ends of said flexible cables from said latches to the bottom of the container, on the opposite sides of said beams from said latches,
  - abutment members formed as parts of the forks of the lift fork and extending downwardly therefrom for engagement with an associated flexible cable, as moved inwardly along an associated hollow beam, for releasing the latches as the forks of the lift fork move within the fork opening into position to effect lifting movement of the container.
- 5. The container of claim 4, wherein spring means bias said latches in locking positions and maintain tension on said flexible cables upon release of said abutments therefrom.

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