April 21, 1964 J. E. GUTRIDGE ETAL 3,129,672

CONTAINER LOCKING DEVICES AND ASSEMBLIES

Filed May 14, 1962

6 Sheets-Sheet 1

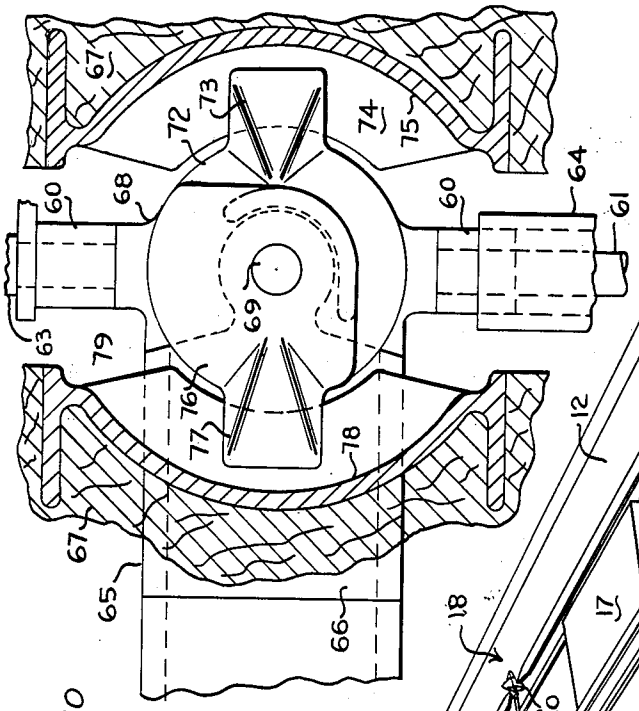


Fig. 10

Fig. 1

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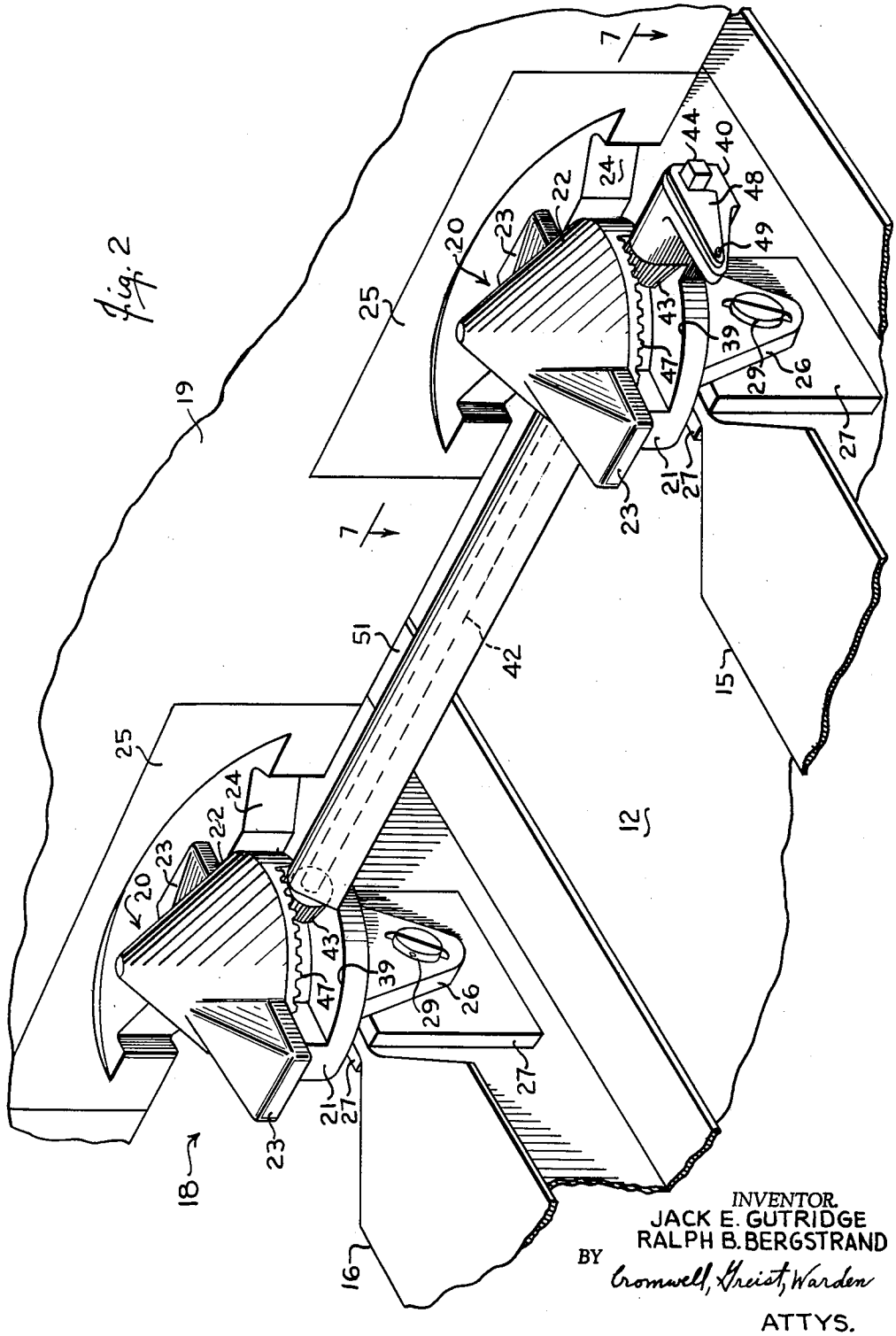
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CONTAINER LOCKING DEVICES AND ASSEMBLIES

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Fig. 2



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CONTAINER LOCKING DEVICES AND ASSEMBLIES

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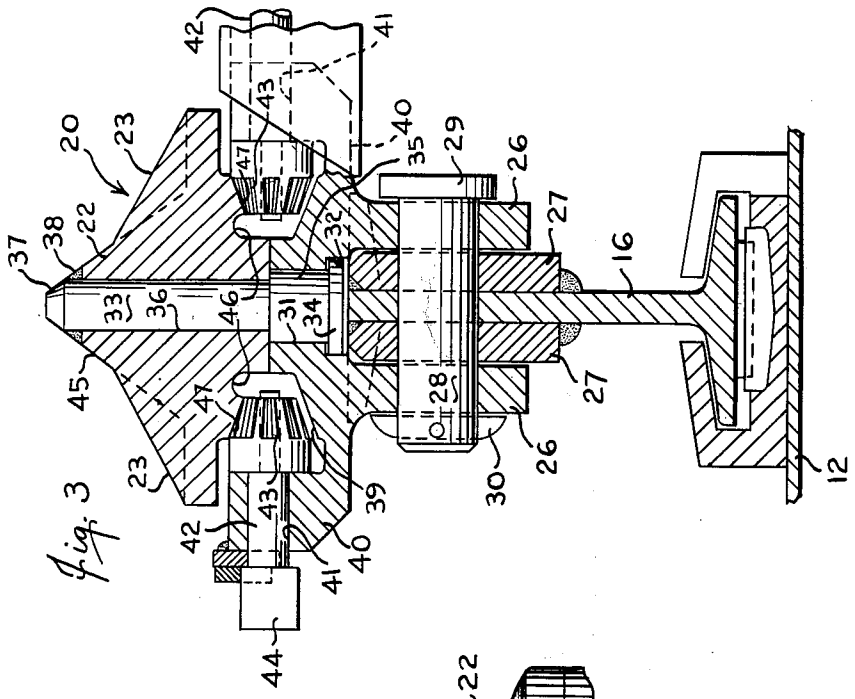


Fig. 3

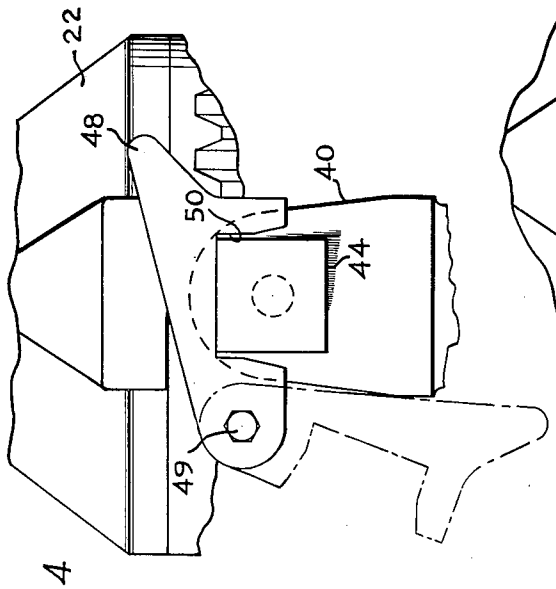


Fig. 4

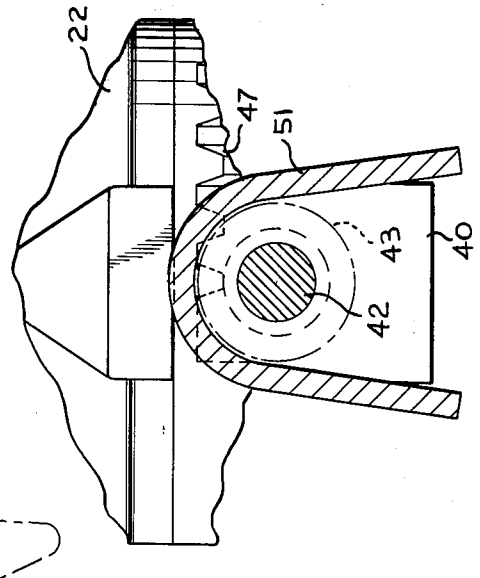


Fig. 5

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CONTAINER LOCKING DEVICES AND ASSEMBLIES

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Fig. 6

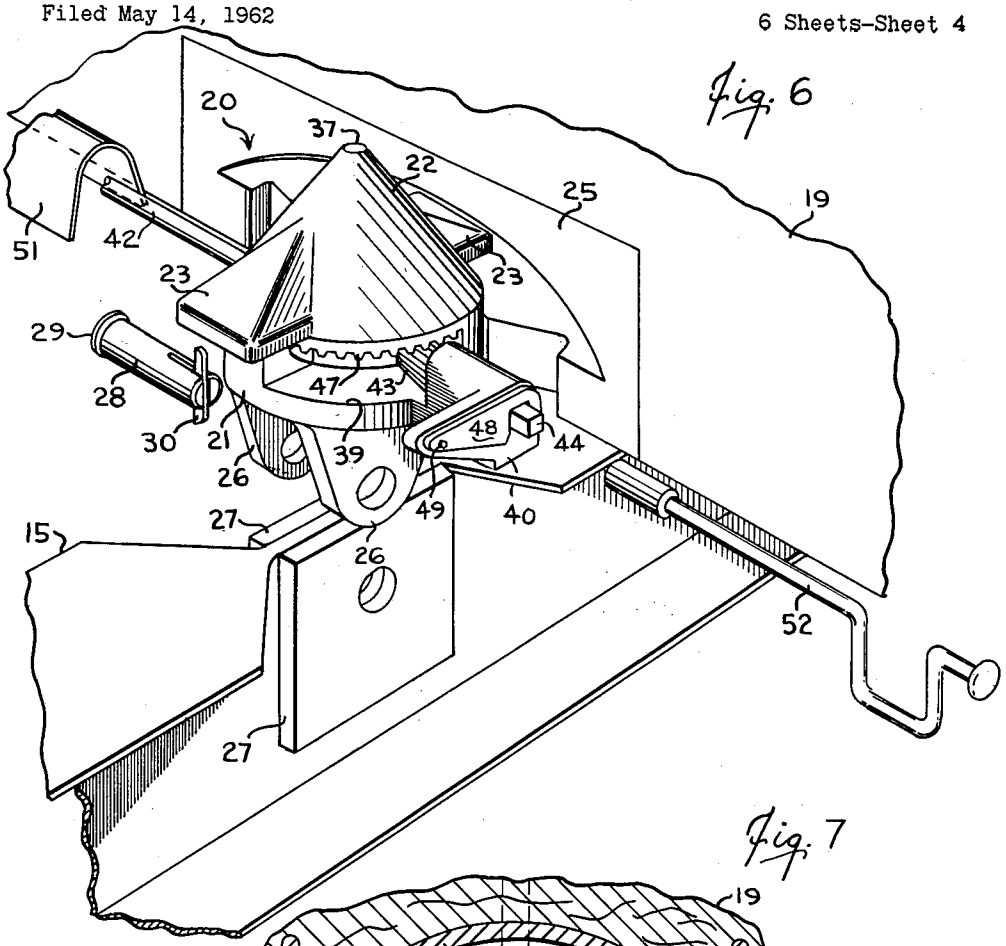
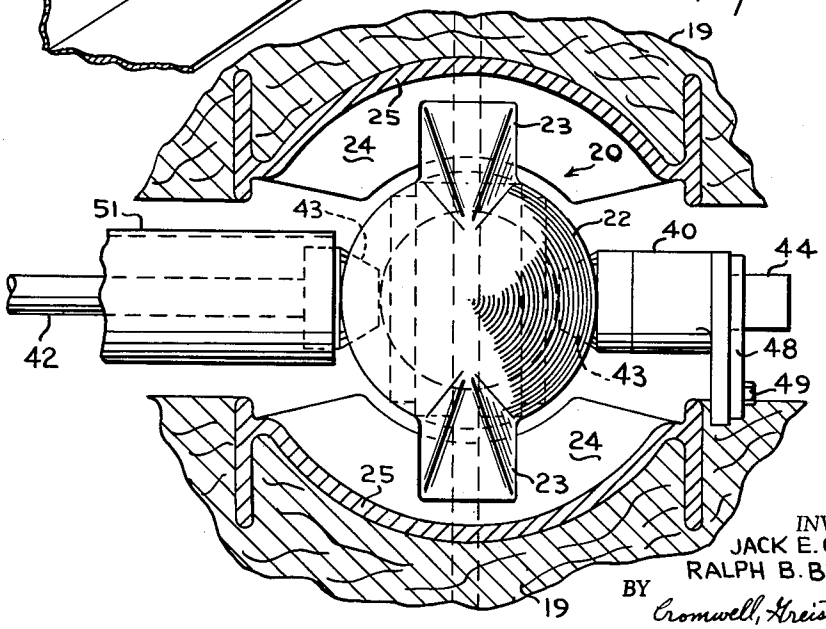


Fig. 7



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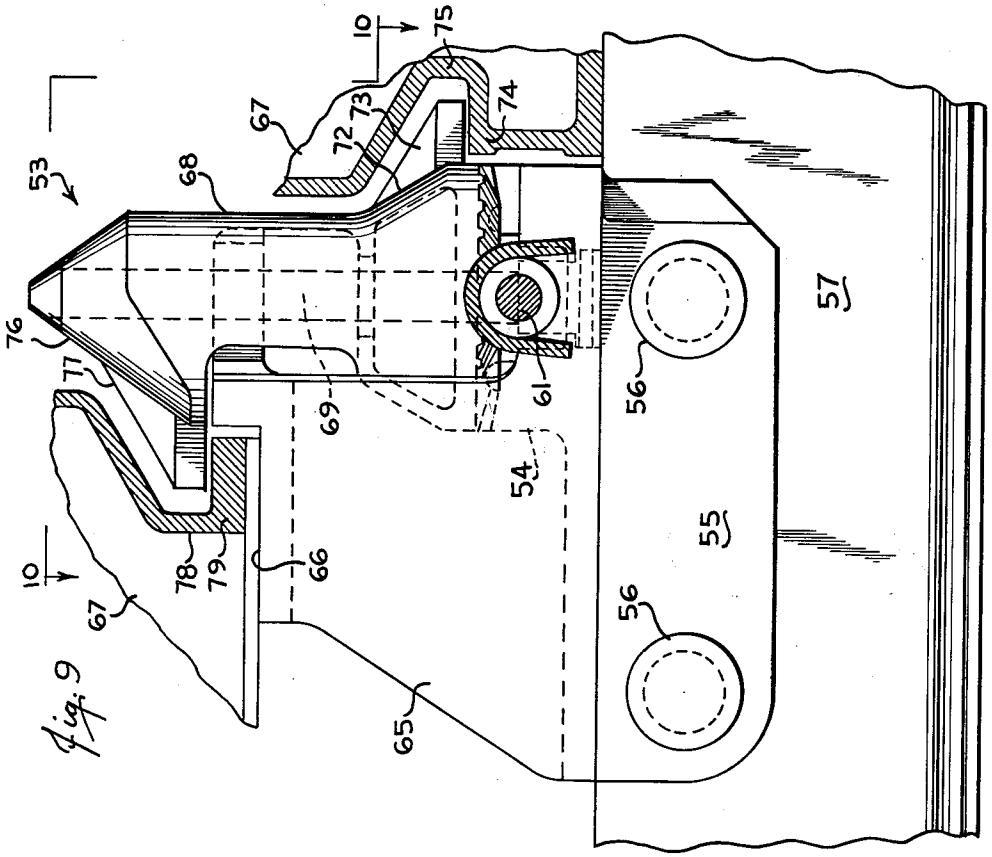


Fig. 9

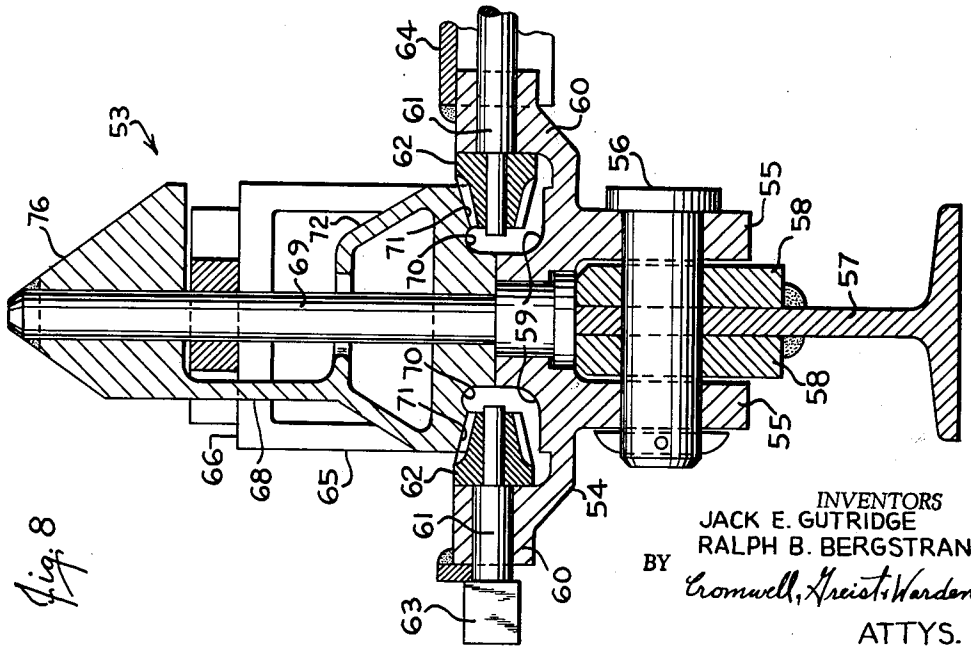


Fig. 8

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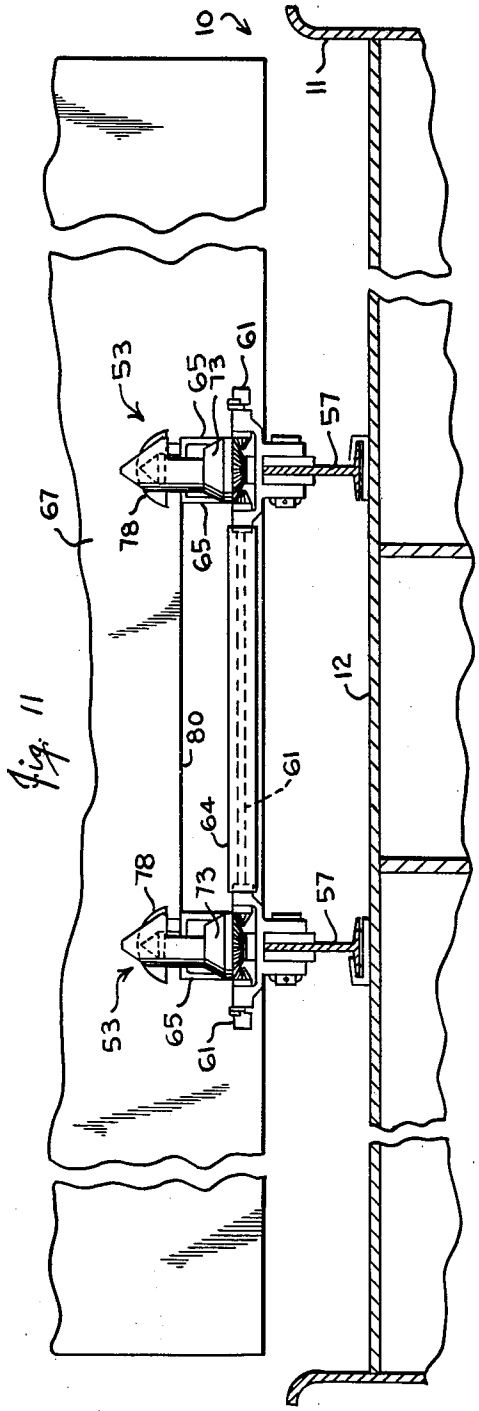


Fig. 11

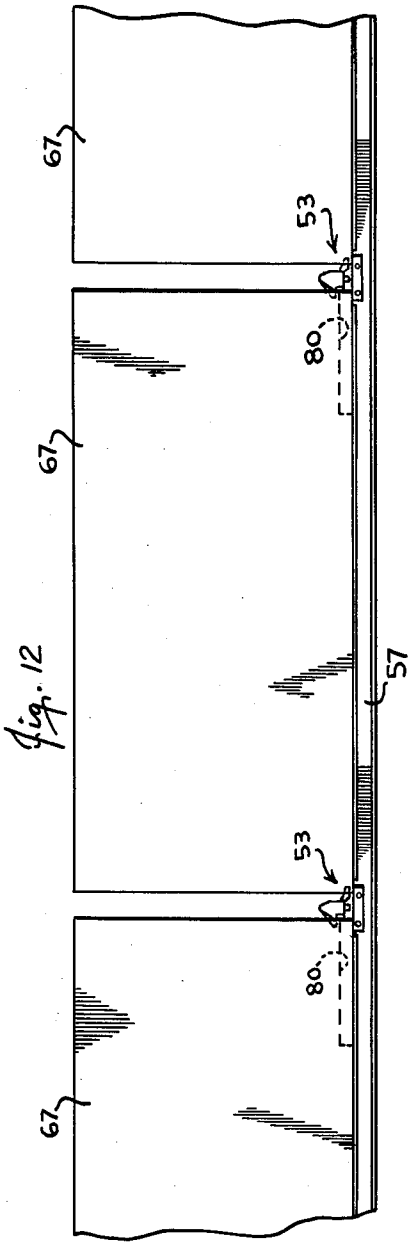


Fig. 12

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United States Patent Office 3,129,672 Patented Apr. 21, 1964

3,129,672
CONTAINER LOCKING DEVICES AND ASSEMBLIES

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Filed May 14, 1962, Ser. No. 194,440
6 Claims. (Cl. 105—366)

The invention is directed to new and improved forms of container locking devices and assemblies comprising the same, the devices and assemblies being particularly adapted for use with railway cars for container lading attachment thereto, but also being readily usable with other types of vehicles.

It is an object of the invention to provide new and improved lading attachment means in the form of container locking devices and assemblies thereof, the attachment means including new and improved operating means forming a part thereof, such operating means being adapted for use with different forms of attachment means also included as a part of the invention.

Another object is to provide a new and improved lading attachment assembly particularly adapted for use on a railway car in conjunction with a cushioned rack assembly forming a part thereof, the lading attachment assembly comprising new and improved lading attachment means having operating means for lading locking and unlocking purposes.

Still a further object is to provide new and improved lading attachment means adapted for ready use with container-type lading of different design and configuration, the attachment means including positive operating means of new and improved type permitting ready and efficient container locking to a vehicle for transportation thereof.

Other objects not specifically set forth will become apparent from the following detailed description of the invention made in conjunction with the accompanying drawings wherein:

FIG. 1 is a perspective of an open deck railway car having mounted thereon a cushioned rack assembly which includes as a part thereof the lading attachment means of the present invention;

FIG. 2 is a fragmentary perspective of a pair of operatively interconnected lading attachment means of the invention illustrating use thereof in locking a container to the rack assembly;

FIG. 3 is a transverse vertical section of one of the attachment means;

FIG. 4 is an enlarged fragmentary elevation of the top portion of the attachment means illustrating a releasable lock unit cooperating with the operating means of the attachment means;

FIG. 5 is a fragmentary section of the lading attachment means interconnecting arrangement providing for simultaneous operation of a pair of such attachment means;

FIG. 6 is an exploded perspective of one of the attachment means illustrating mounting thereof on the rack assembly;

FIG. 7 is a fragmentary sectional plan view of one of the lading attachment means as viewed generally along lines 7—7 in FIG. 2;

FIG. 8 is a transverse vertical section of a modified

form of lading attachment means constituting a part of the present invention;

FIG. 9 is a fragmentary side elevation of the attachment means of FIG. 8 illustrating operative use thereof;

FIG. 10 is a sectional top plan view of the modified attachment means taken generally along line 10—10 in FIG. 9;

FIG. 11 is a fragmentary transverse section of the deck portion of a railway car illustrating operative use of the modified attachment means in conjunction with a specific form of container; and

FIG. 12 is a diagrammatic view in side elevation of the use of the modified attachment means in locking a plurality of special containers to a cushioned rack assembly.

Referring to FIG. 1, a generally flat deck container car 10 is illustrated as having an underframe 11 provided with an open flat deck portion 12, opposite end coupler housings 13, and being wheel-supported by truck units 14 adjacent opposite ends thereof. The deck 12 has mounted thereon a cushioned rack assembly of known type including a pair of longitudinally extending, transversely spaced rail members 15 and 16 suitably slidably mounted on the deck 12 and attached to the deck through cushion assemblies 17. The rack assembly is designed to support containers on the car for controlled sliding movement relative to the car in a response to buff and draft operational shock as is generally known. A plurality of transversely interconnected container locking assemblies 18 are mounted on the rail members 15 and 16 in longitudinally spaced relation along the car to lock containers thereto for cushioned travel relative to the car.

FIG. 2 illustrates an assembly 18 in locking engagement with an end of a container 19 supported on the rail members 15 and 16. Each assembly generally comprises a pair of container locking devices 20 each formed generally from a base member 21 and a locking member 22 which is pivotally mounted on the base member. Each locking member 22 includes a pair of oppositely radially projecting locking flanges 23 arranged to engage a locking ledge 24 in overlapping top surface relation therewith. The locking ledge 24 forms a part of a lock casting 25 mounted in recessed relation in an end or side wall of a container 19. The lock castings 25 illustrated are of known type and the locking devices 20, to the extent described above, are based generally on the design considerations disclosed in the copending application Serial No. 111,755, filed May 22, 1961.

Referring particularly to FIG. 3 while also having reference to FIGS. 2 and 4–7, the improved design features of the locking devices 20 will be described. The base member 21 consists of an upper horizontally arranged annular portion having formed integrally along the bottom surfaces thereof with a pair of bifurcated locking ears 26. As best shown in FIG. 6, each rail member 15 and 16 has the top flange portion thereof removed in the area of locking device attachment and the depending ears 26 of the base member 21 are received along outer surfaces of reinforcing plates 27 fixed along the side vertical surfaces of the rail member. The ears 26, reinforcing plates 27 and central vertical portion of each rail member are provided with apertures which become aligned upon proper seating of the base member 21. A releasable locking pin 28 provided with an enlarged head

portion 29 and a pivotally mounted lock plate 30 at opposite ends thereof is received through the aligned apertures to fix the base member 21 to the rail member. The arrangement described permits ready removal of the locking assemblies from the cushioned rack assembly when it is desired to convert the railway car for use with other types of lading.

The top portion of the base member 21 centrally thereof is formed with a bore 31 provided with an enlarged shoulder area 32 adjacent the base thereof. A spindle 33 is received in the bore 31 and is formed at the bottom thereof with an enlarged head portion 34 which is pivotally confined in the enlarged shoulder area 32 of the bore in engagement with the top surface of the rail member and reinforcing plates 26. The spindle inwardly of the head 34 is formed with an enlarged neck portion 35 which is also pivotally received in the bore 31. The reduced top end portion of the spindle 33 projects upwardly from the top surface of the base member 21 and is received through a bore 36 formed centrally in the locking member 22. The top end of the spindle 33 is provided with a conical face 37 and is fixed to the locking member 22 by an annular weld 38. With this arrangement the locking member 22 is permitted to pivot relative to the base member 21 while it is fixed thereto against displacement.

The base member 21 radially outwardly of the central bore 31 thereof is formed with a pair of arcuate recesses 39 which may be of conical shape as illustrated. These recesses are oppositely spaced relative to one another along opposite sides of the base member 21 arranged generally along opposite sides of the supporting rail member. Thus an outwardly and inwardly located recess is provided.

The base member 21 outwardly of each recess 39 and adjacent an end thereof has integrally formed therewith an outwardly and upwardly projecting boss or journal member 40 which has formed therein a horizontally directed bore 41 rotatably mounting therein a gear spindle 42. The inner end of each spindle 42 has formed thereon an enlarged gear head having an outer end beveled gear portion 43 received in the adjacent recess 39 of the base member 21. The outer end of one of the spindles 42 is formed with an enlarged square head 44 adapted to receive an operating tool such as a wrench or the like thereabout for rotation of the beveled gear portion 43. As best illustrated in FIG. 2, the spindle 42 carrying the enlarged square head portion 44 is that which projects outwardly from the rail member supporting the locking device. The innermost spindle 42 is preferably continuous transversely across the car between the rail members 15 and 16 and operatively interconnects the pairs of transversely spaced locking devices 20.

Each locking member 22 is formed with a cone-shaped top surface 45 presenting a guide surface for engagement with container edges during overhead loading of containers on the car for proper positioning thereof between the locking assemblies 18. As previously described, each locking member is formed with a pair of oppositely radially projecting locking flanges with each flange provided with a flat bottom surface and an included top surface which generally constitutes a continuation of the cone surface 45. The bottom surface of the locking member 22 is formed with oppositely positioned arcuate recesses 46 overlying the base member recesses 39 and provided with inclined gear tracks 47 in intermeshing engagement with the beveled gear portions 43 of the spindles 42. With the forming of the beveled gear portions 43 on the outer end of an enlarged head portion of each spindle 42 as previously described, the arrangement provides for proper holding of the spindles 42 in operative position and the outermost spindle 42 is held with its outer enlarged square head 44 spaced outwardly from the adjacent surface of the journal member 40 supporting the same.

FIGS. 2, 4 and 6 best illustrate the provision of a pivotally mounted locking lever 48 mounted on an outwardly directed pin 49 carried by the outer surface of the outermost journal member 40. The locking lever 48 is formed with a locking detent 50 which confines the top square portion of the enlarged head 44 of the outermost spindle 42 to prevent rotation thereof when in the operative position shown in full lines in FIG. 4. When it is desired to operate the locking devices 20, the locking lever 48 is pivoted into its inoperative depending position shown in broken lines in FIG. 4.

The innermost spindle 42 as previously described extends transversely across the car between the rail members 15 and 16. A protective inverted U-shaped hood 51 is fixed at opposite ends about the innermost journal members 40 of the locking devices 20 and extends in covering protective relation over the innermost spindle 42 between the rail members 15 and 16 as best illustrated in FIGS. 2 and 5.

The locking position of the devices 20 is shown in FIGS. 2, 6 and 7 with a locking flange 23 being received over the top surface of the ledge 24 of a container lock casting 25 as previously described. The oppositely directed flange 23 will of course be similarly engaged with container lock castings of an adjacent container thus providing for double end locking of adjacent containers 19. The unlocked position of a locking device 20 as illustrated in FIG. 3 wherein the locking flanges 23 are located in overlying parallel relation with the spindles 42. In this position the locking flanges are directed transversely across the car and completely clear the locking ledges 24 of adjacent containers to permit ready loading or unloading of containers.

Pivotal operation of the lock members 22 of each locking device 20 is brought about by engagement of the outermost spindle 42 of one of the devices 20 of an assembly 18 by a suitable tool such as the tool 52 shown in FIG. 6. The outermost spindle 42 is rotated resulting in cam-type operation of the adjacent locking member 22 and resultant cam-type operation of the intermediate transverse spindle 42 which in turn results in simultaneous operation of the remaining locking device 20 of the assembly. With this arrangement the locking members of a single assembly are simultaneously operated and each assembly may be readily operated from either side of the car. If desired, the locking devices 20 of a single assembly need not be operatively interconnected but may be subject to single operation. Under such circumstances the intermediate spindle 42 and associated gear portions 43 would be eliminated thus also eliminating the necessity of providing the extra gear track 47 of each of the locking members 22.

FIGS. 8–12 deal with a modified form of locking device 53 adapted for multiple vertical level locking to accommodate the attachment of different types of containers on a single railway car. Referring particularly to FIGS. 8–10, each locking device 53 comprises a base member 54 of similar design as previously described including the depending mounting ears 55 connected by a removable pin 56 to a rail member 57 over side surface reinforcing plates 58. The base member 54 further includes a pair of oppositely positioned arcuate recesses 59 having formed integrally therewith adjacent one end thereof outwardly and upwardly extending bosses or journal members 60 suitably mounting therein rotatable spindles 61 provided with beveled gears 62 received in the recesses 59. The outermost spindle 61 includes an enlarged square head 63 for tool engagement and the innermost spindle extends transversely across the car between rail members 57 (FIG. 11) and is protectively covered by a hood 64. The base member 54 further includes a longitudinally directed container support plate 65 provided with a flat top surface portion 66 which is located substantially above the top surface of the rail members 57 and provides a supporting ledge on which a bottom edge surface of a container 67 may be received in supported engagement.

The support member 65 extends upwardly to one side of a vertically elongated locking member 68 pivotally mounted on the base member 54. As best shown in FIG. 9, the support member 65 also includes as a part thereof a continuation of the base member attachment ears 55 and a pair of removable pins 56 are used to attach the complete unit to the rail member.

The lock member 68 is formed from a casting centrally supported on a spindle 69 suitably pivotally journaled in the base member 54 in a manner previously described. The bottom portion of the locking member 68 is formed with oppositely positioned arcuate recesses 70 overlying the base member recesses 59 and including as a part thereof beveled gear track portions 71 in operative engagement with the gear portions 62 of the operating spindles 61. The locking member 68 above the bottom recesses 70 thereof is formed with a semi-conical surface portion 72 having integrally formed therewith a single radially outwardly projecting locking flange 73 which as illustrated in FIGS. 9 and 10 is in locking relation with a locking ledge 74 of a container lock casting 75 formed in the end wall portion of a container 67. The lower conical portion 72 is not circumferentially continuous about the locking member 68 to prevent interference thereof adjacent container support member 65 as best illustrated in FIG. 9. Thus, the extent of the lower conical portion 72 is limited to provide an adequate inclined surface for engagement with a rear edge of the container 67 during loading thereof to guide the container into proper position, and yet not become engaged with any other fixed member such as the container support member 65 upon pivoting of the locking member 68 into its inoperative container unlocking position.

The top portion of the locking member 68 is formed with an upper semi-conical surface portion 76 having integrally formed therewith a radially outwardly projecting locking flange 77 which is oppositely positioned relative to the lower locking flange 73. The upper conical surface portion 76 is circumferentially limited to the extent of the previously described limitation of the lower conical surface portion 72 to also provide container guiding functioning relative to the front edge of an adjacent container 67 and yet prevent interference with the rear edge surface of the other 67 when the locking member 68 is pivoted into its inoperative container unlocking position. The upper conical surface portion 76 projects outwardly over the top edge of the container support member 65 and the locking flange 77 projects into a lock casting 78 mounted in a front edge portion of the container 67 and including a locking ledge 79 over which the flange 77 projects.

FIGS. 11 and 12 illustrate the type of containers 67 with which the modified locking devices 53 are adapted for use. The containers 67 are commonly known as trailer bodies which are detachably mounted on a trailer frame for tractor hauling purposes. In mounting the container 67 on a trailer frame, a front end tunnel-like recess 80 is formed in the container to receive therein a specially constructed portion of the trailer frame (not shown) to provide for stabilized attachment of the container thereto. The tunnel-like portion 80 as illustrated in FIGS. 11 and 12 is centrally located in the front end of the container 67 and extends inwardly therefrom but terminates well prior to the center transverse axis of the container. The tunnel portion 80 is also limited centrally of the container end and is confined well within the opposite sides of the container. With this arrangement, bearing in mind that the rack assembly of a railway car is of limited width and is used in centrally supporting a container longitudinally thereof, the tunnel portion 80 is located directly over the rack assembly and the front edge of the container does not provide a bottom edge portion parallel with the remaining lower edge portions thereof which can be used in supporting the front end of the container directly on the rail members of the rack assembly.

The locking device 53 provides a support surface in the form of the support member 65 located adjacent opposite side margins of the tunnel portion 80 and extending upwardly into supporting engagement with the innermost surface of the tunnel portion 80. The rear end of the container 67 does not include the tunnel portion and is directly supported on the rail members in the conventional manner. Thus the special locking devices 53 are operative to engage lock castings 78 carried in the front end wall of the container 67 directly above the tunnel portion 80 and are also operative at a lower level to engage similar lock castings carried in the rear wall of an adjacent container 67. This locking arrangement is particularly shown in FIGS. 9 and 12. It must be borne in mind that the multiple level locking devices 53 may be advantageously used with a series of containers 67 as well as an appropriate combination of containers 19 and 67.

Obviously certain modifications and variations of the invention as hereinbefore set forth may be made without departing from the spirit and scope thereof, and therefore only such limitations should be imposed as are indicated in the appended claims.

We claim:

1. Lading attachment means for vehicle mounting, said attachment means comprising a base member supporting vertically thereon a locking head which is rotatable about a vertical axis relative to said base member, means interconnecting said base member and locking head to permit rotation of said locking head, said locking head including a generally cone-shaped top portion and an enlarged base portion, said locking head being provided with at least one horizontally projecting locking flange for locking engagement with lading upon selected rotation of said locking head, rotation imparting means carried by said locking head in the area of said base portion and concentric to the vertical axis of rotation of said locking head, and drive means journaled in said base member transversely thereof and in engagement with said rotation imparting means, said drive means being confined in said base member relative to said locking head with said locking flange projecting substantially outwardly of said drive means in the selectively rotated locking position of said locking head.

2. Lading attachment means for vehicle mounting, said attachment means comprising a base member supporting vertically thereon a locking head which is rotatable about a vertical axis relative to said base member, means interconnecting said base member and locking head to permit rotation of said locking head, said locking head including a generally cone-shaped top portion and an enlarged annular base portion, said locking head being provided with at least one horizontally projecting locking flange for locking engagement with lading upon selected rotation of said locking head, rotation imparting means carried by the base portion of said locking head peripherally thereof and concentric to the vertical axis of rotation of said locking head, and drive means journaled in said base member transversely thereof and in engagement with said rotation imparting means, said drive means being operable about an axis which intersects said vertical axis.

3. The lading attachment means of claim 2 wherein said rotation imparting means is in the form of an arcuate gear track and said drive means is in the form of a rotating gear means.

4. The lading attachment means of claim 2 wherein said locking head includes vertically spaced locking flanges projecting horizontally therefrom in opposite directions.

5. In a vehicle having a deck portion mounting a rack assembly, which assembly includes spaced longitudinally extending rail members adapted to support container-type lading thereon, the provision of lading attachment means mounted on top surface portions of said rail members and projecting vertically upwardly therefrom to attach lading thereto, said lading attachment means being arranged in longitudinally spaced pairs to receive container-type lading therebetween and each comprising a base member sup-

porting vertically thereon a locking head which is rotatable about a vertical axis relative to said base member, means interconnecting said base member and locking head to permit rotation of said locking head, said locking head including a generally cone-shaped top portion and an enlarged base portion, said locking head being provided with at least one horizontally projecting locking flange for locking engagement with lading upon selected rotation of said locking head, rotation imparting means carried by said locking head in the area of said base portion and concentric to the vertical axis of rotation of said locking head, and drive means mounted on said rack assembly and in engagement with said rotation imparting means, said rotation imparting means and said drive means being exposed along an outer side of a rail member.

6. The vehicle of claim 5 wherein the base member of each lading attachment means includes means releasably attaching the same to a rail member.

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