United States Patent

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[54] **CONTAINER LATCH MECHANISM**
11 Claims, 7 Drawing Figs.

[52] **U.S. Cl.** **248/361,** 105/366
[51] **Int. Cl.** **B65d 19/38,** B61d 45/00
[50] **Field of Search** ..... 248/361; 292/200, 60; 287/2; 105/366(Cursory), 366.2, 366.4, 366.6, 366.8

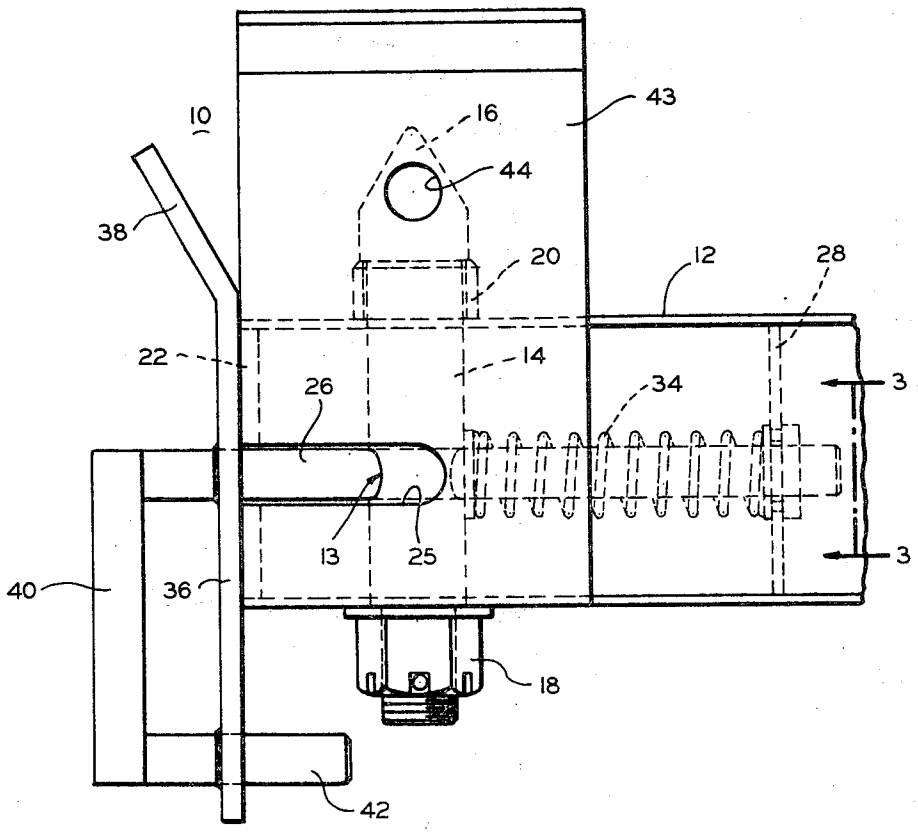
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ABSTRACT: A latch mechanism for latching either of two types of containers to a supporting structure. Movement of the mechanism between the unlatched position and the latched position latches to the supporting structure whichever type of container has been placed thereon. The mechanism includes a vertically disposed pivotal member which carries a latch head portion at one end thereof for latching one type of container. Also included in the mechanism is a detent which is arranged to project through an opening in a portion of the supporting structure and into a mating opening in another type of container to latch it in position.



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SHEET 1 OF 3

FIG. 1

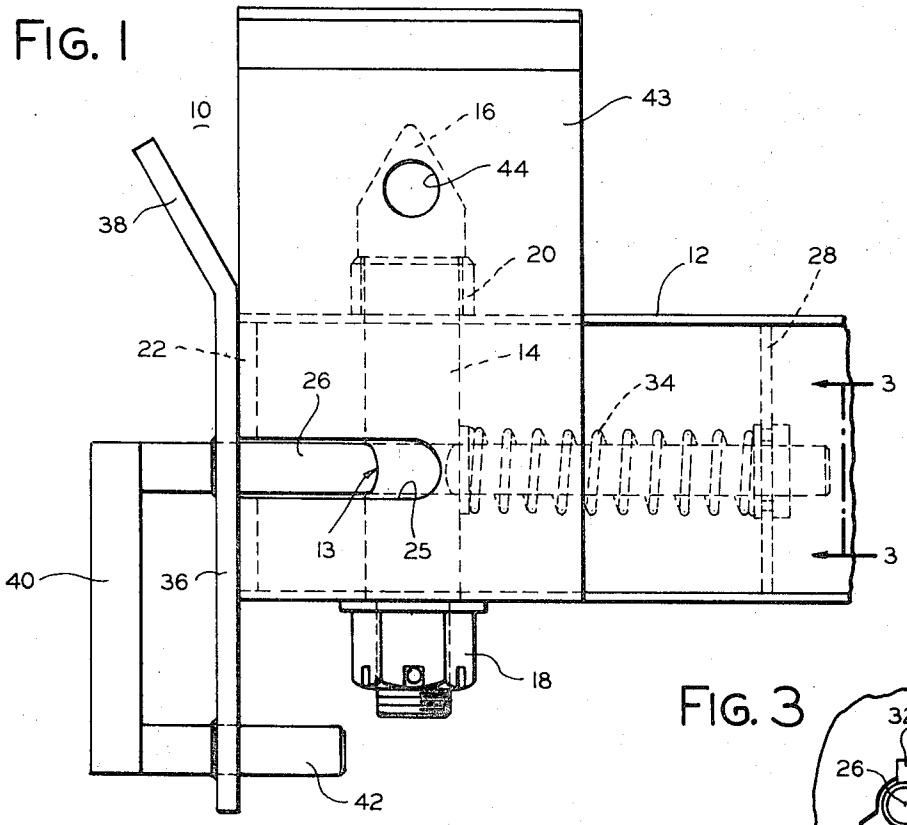


FIG. 3

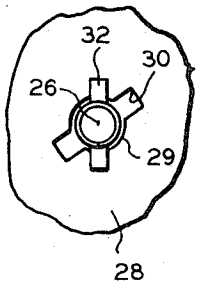
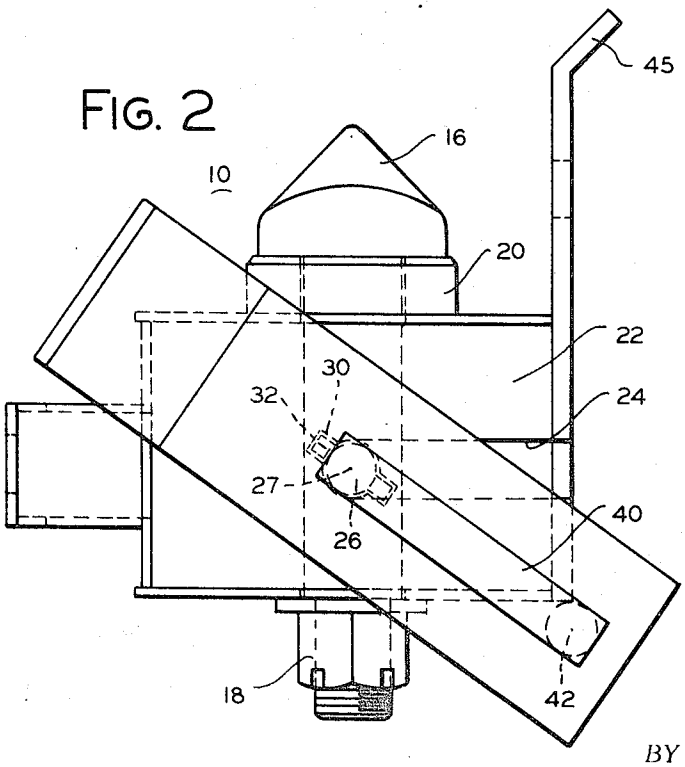


FIG. 2



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FIG. 4

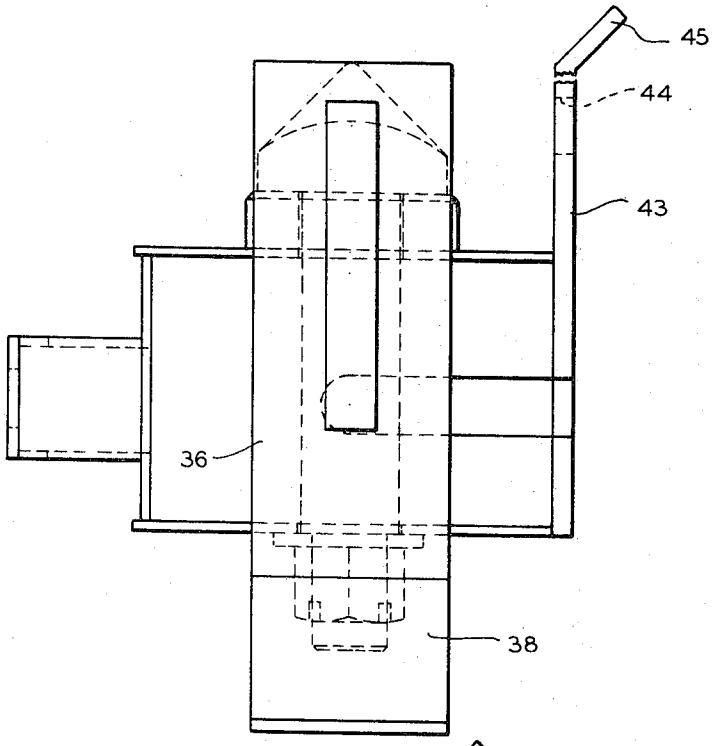
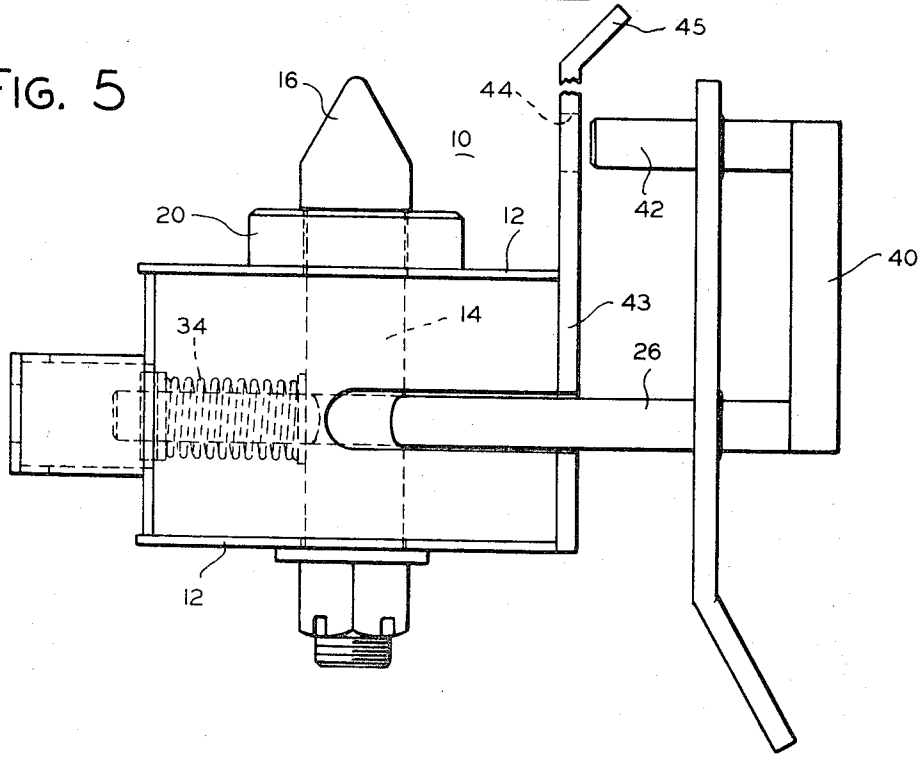


FIG. 5



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FIG. 6

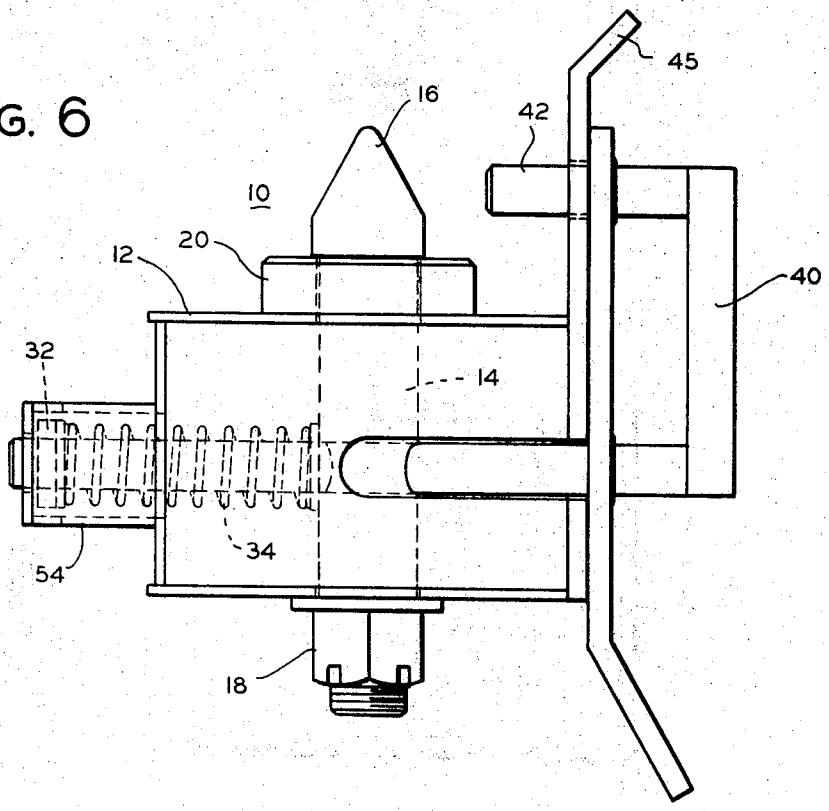
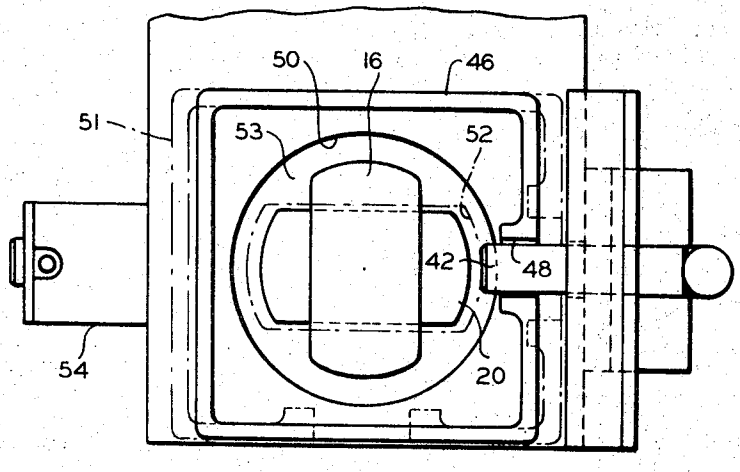


FIG. 7



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CONTAINER LATCH MECHANISM

BACKGROUND OF THE INVENTION

This invention is particularly adaptable for use in latching shipping containers to conveyances such as semitrailer chassis which are adapted to be pulled over the highway or to railroad cars, but it is adaptable for other purposes as well. It is known that all shipping containers do not have the same fittings or arrangements for latching or otherwise securing them to the conveyances on which they are to be carried. This makes it desirable for conveyances which will be used to transport containers to have latch mechanisms which will accommodate more than one type of container. It is the object of the present invention to provide a latch mechanism which automatically will accommodate either of two different types of containers.

SUMMARY OF THE INVENTION

In carrying out our invention in one preferred form thereof we provide a latch mechanism which includes a frame structure and a vertically disposed pivotal member carried on the frame structure, the pivotal member carrying a latch head portion at one end thereof. Means are provided for pivoting the pivotal member between an unlatched position and a latched position. With one type of container the latch head portion engages or overlies a mating portion of the container and secures the container to the frame structure. There is a vertically projecting portion on the frame structure having an opening therethrough; and a detent is provided which extends through the said opening and into a mating opening in another type of container to secure such container to the frame structure.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 shows a side elevational view of a latch mechanism in accordance with this invention;

FIG. 2 shows an end elevational view of the same mechanism after initial preparation for movement to the latched position;

FIG. 3 is a fragmentary view of a portion of the latch mechanism along the line 3–3 of FIG. 1;

FIG. 4 is another end elevational view similar to FIG. 2, but with a portion of the mechanism turned to a different position;

FIG. 5 is an end view showing the latch mechanism turned to the latched position for one type of container;

FIG. 6 is similar to FIG. 5, but shows further movement to accomplish latching of another type of container; and

FIG. 7 shows a top plan view which illustrates the mating latching parts of both types container

DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment of the invention described and illustrated herein is for use in latching to a conveyance or other supporting structure either a USASI (United States of America Standards Institute) 20 foot container which is 20 feet long, 8 feet high, and 8 feet wide, or the 24 foot container which is utilized by the Matson Navigation Company which is 24 feet long, 8 and ½ feet high and 8 feet wide. It will be readily recognized, however, that the present latch mechanism can be utilized with equal facility with other containers.

The latch mechanism shown also may be utilized as a guide for locating the container on the supporting structure, but this is an optional feature and may be omitted if desired. However, this additional feature should be kept in mind as it will facilitate an understanding of the complete mechanism as disclosed herein.

In the drawing the latch mechanism of this invention is indicated generally by the numeral **10**. As shown, the mechanism **10** is mounted upon and partially within a bolster member indicated by the numeral **12**. Such bolster may be, for example, a transversely extending frame or support member forming a portion of a semitrailer chassis adapted to transport containers over the highway. However, it will be understood that this invention is not limited to use with such a bolster

member. The latch mechanism of this invention may be mounted on any suitable frame or other structural member, and reference to "frame" in some of the claims includes any such structural member.

The latch mechanism **10** as shown in FIG. **1** in the unlatched position and in the embodiment illustrated also serves in this position as a guide to assist in locating the container when it is deposited on the bolster The latch mechanism includes a vertically disposed pintle member **14** which extends through openings in the upper and lower walls, or top and bottom, of bolster **12**, and is pivotal about its vertically disposed axis through an angle of approximately 90°. At the top of pintle **14** it is provided with a latch head portion **16** which may be formed integrally with the pintle member, but in any event is rigidly secure thereto. At the bottom a lock nut **18** or equivalent means is utilized to secure the pintle member in position on the bolster **12**. The pintle member **14** extends up through a spacer or collar member **20** which is rigidly secured to the upper surface of bolster **12**, and the purpose of this spacer is explained hereinafter.

As viewed in FIG. **1**, the left margin of the bolster **12** is considered as the outer end thereof and is so referred to in this description. At such outer end the bolster includes a plate **22** which is preferably welded to the remainder of bolster **12** and thereby forms an integral part thereof. As seen in FIG. **2**, the endplate **22** has a horizontal slot **24** which extends from the right edge (as seen in this view) into and a little past the center, that is, a little past a horizontal centerline through the pintle **14** which is indicated by the numeral **27** and extends longitudinally through the bolster. The slot **24** extends enough past the centerline **27** to permit an operating member or rod **26** to extend longitudinally of the bolster through such slot, and through a suitable opening **13** in the pintle member **14**; and in the position of FIG. **1** the rod **26** extends on through an opening **29** in a transverse brace member **28** extending between the upper and lower walls of the bolster member. The brace member **28** has a key slot **30** therein at approximately a 55° angle with the vertical as indicated in the fragmentary view of FIG. **3**. A pin **32** extends through rod **26**, and a compression spring **34** is provided to urge the outer end of rod **26** which carries the pin **32** away from pintle **14** at all times.

In the position of FIG. **1**, the pin **32** is beyond the brace **28** and holds a plate or stop member **36**, which is rigidly secured to rod **26**, against the end of the bolster. The spacing between end **22** and brace **28** is such that stop member **36** is held rigidly against end **22** in this position. Stop member **36** has an outwardly flared portion **38** at the upper end thereof as seen in FIG. **1** which may serve as a guide for a container being lowered onto the bolster **12**. If the guide feature is not needed, portion **38** can be omitted and pin **32** in the rod **26** and the slot **30** in the brace **28** likewise can be omitted because it is the pin **32** bearing against the brace **28** which holds guide portion **38** rigidly in position so that it will function as a guide and move the edge of the container toward the desired location as it is lowered onto the bolster. It is important, however, to retain brace member **28** or its equivalent and opening **29** therein because when rod **26** is positioned in opening **29** the operator can then be assured that latch head portion **16** is in the proper position to receive a container; if it were not for such an alignment arrangement it would be possible for the latch head portion **16** to be turned about the axis of pintle **14** through an angle from the proper unlatched position illustrated in the drawing with the result that the latch head portion might interfere with the placing of a container on the support.

In the embodiment illustrated herein the first action to be taken in order to move the latch mechanism from the unlatched position of FIG. **1** toward the latched position is to turn rod **26** approximately 55° counterclockwise as indicated in the end view of FIG. **2**. This can be accomplished by grasping the handle portion **40** which is secured to rod **26** and stop **36**. When the pin **32** lines up with the key slot **30** (see FIG. **3**) the rod **26** then can be pulled outwardly of the end of the bolster, that is, to the left in FIG. **1**, against the force of spring **34**, until the pin **32** is beyond brace **28**.

During such portion of the operation, a projecting rod or detent member **42** which is secured to member **36** will abut the bottom surface of bolster **22** as illustrated in FIG. **2**. The handle **40** is then pulled out farther so that detent **42** will clear the end of the bolster and the handle **40** is then tuned counterclockwise an additional approximately 135° until member **36** has been inverted as indicated in FIG. **4** of the drawing. The detent **42** is utilized to latch a container to a bolster **12** as illustrated in FIGS. **5**, **6** and **7** of the drawing.

The latching mechanism includes an upwardly projecting portion **43** on one side of the bolster which preferably is welded to and forms an integral part of such bolster, and at the top of portion **43** in the form illustrated is a flared portion **45** which like flared portion mentioned previously serves as a guide for a container being lowered onto the bolster **12**. Like flared portion **38**, flared portion **45** is not essential and may be omitted if desired. In the upper part of the portion **43** but below the flared part **45** is an opening **44**. Referring to FIG. **1** it will be seen that portion **43**, like the end of the bolster also has a horizontal slot, such slot being indicated by the numeral **25** and communicating with the slot **24** in the end of the bolster and extending horizontally along the bolster sufficiently that the rod **26** can be pivoted from the longitudinal position of FIG. **1** and FIG. **2** approximately 90° to a transversely disposed position as illustrated in FIG. **5**. To move the mechanism from the position of FIG. **4** to that of FIG. **5** the handle **40** is grasped and the rod **26** is moved through the slot portions **24** and **25** in the end and side of the bolster, such movement pivoting pintle **14** approximately 90°. It will be appreciated that it is necessary to pull out on handle **40** to compress spring **34** in order to move member **36** around the corner of the bolster to the position illustrated in FIG. **5**. When the position of FIG. **5** is reached, the operator merely releases the handle **40** and the spring **34** acting against the pin **32** forces the mechanism into the latched position illustrated in FIG. **6**. In this position the detent **42** extends through the member **43** and into a mating opening in the container thereby holding such container in position on the bolster. This is illustrated in FIG. **7** of the drawing which is actually a partial sectional view from above looking down on the latching mechanism with the containers in place, but the cross hatching has been omitted for purposes of clarity, and one of the containers is shown in dot-dash lines. The corner fitting of a Matson container is shown in solid lines in FIG. **7** and is indicated by the numeral **46** and it will be observed that the detent **42** engages an opening **48** in the fitting **46** to provide the connection between the container and the bolster. The Matson corner fitting has an opening **50** which is sufficiently large that it is not engaged by the head portion **16** of the pintle member **14** and therefore the turning of such head portion has no effect on the Matson container.

However, if it is desired to secure a USASI container to the bolster **12** it is the head portion **16** which accomplishes this. The USASI container, the corner fitting of which is indicated by the numeral **51**, has an opening **52** which is slightly larger than the spacer **20** and of the same shape, and the thickness of the bottom **53** of corner fitting **51** of the USASI container is slightly less than the height of spacer **20** and is such that when the pintle member is turned so that the head portion **16** is in the position illustrated in FIG. **7** and overlies bottom portion **53** the container is secured to the bolster. If further information is desired as to the manner in which such latching is accomplished, reference may be had to U.S. Pat. No. 2,963,310, particularly FIGS. **8** through **11** of such patent, which illustrate the operation of a similar latch for a USASI type container only, not including the features provided herein for optionally using a dual-purpose mechanism for latching a Matson container.

The housing **54** on the side of the bolster is to protect rod **26**, pin **32** and spring **34** in the latched position, and the housing also helps to guide the rod **26** into the proper position to secure and maintain proper alignment of the mechanism in the latched position.

It will be readily understood that this latch mechanism can be moved from the latched to the unlatched position by the reverse of the procedure described herein, and it is believed that no detailed description of this is necessary. However, the importance of the position illustrated in FIG. **2** should be mentioned in connection with the movement to the unlatched position. The fact that detent **42** abuts the bottom of bolster **22** when pin **32** lines up with slot **30** is important. It will be appreciated that the operator cannot see pin **32** and slot **30** when he is operating the mechanism, but the arrangement mentioned, plus the location of the left end of slot **24** (as seen in FIG. **2**) to align rod **26** with opening **29** in the brace **28** makes it possible readily to secure the necessary alignment of both the rod **26** and the pin **32** to move the mechanism back to the position of FIG. **1**. While a definite angle has been specified herein in connection with the location of slot **30** it will be readily apparent that this angle may vary depending upon the thickness of the bolster **22** or more specifically how far below axis **27** the bottom of the bolster **22** is located and also the relative location of detent **42**. The angles given herein are for purposes of illustration only.

While we have described and illustrated herein a preferred embodiment of our invention in accordance with the statutes, it will be appreciated that modifications may be made. Therefore, it should be understood that we intend to cover by the appended claims all such modifications which fall within the true spirit and scope of our invention.

We claim:

1. A latch mechanism comprising a frame structure, a vertically disposed pivotal member carried on the frame structure, a latch portion at one end of said pivoted member, means for pivoting the said pivotal member between an unlatched position and a latched position comprising an operating member and slot in the said frame structure through which the said operating member moves, the said frame structure having an opening therethrough separate from the said slot, and a detent carried on the said operating member which extends through the said opening in the latched position.

2. A latch mechanism as specified in claim **1** in which additional means are provided for releasably holding the mechanism rigidly in the unlatched position.

3. A latch mechanism as specified in claim **1** in which means are provided for releasably holding the said latch mechanism in the latched position.

4. A latch mechanism comprising a frame structure having top and bottom walls, an end wall and a sidewall, the said top and bottom walls having vertically aligned openings therein, a vertically disposed pintle member carried by the said frame structure and extending through the said openings, a latch head portion at the top end of said pintle member, the said pintle member having a horizontally disposed opening therethrough, a rod extending through the said opening and arranged for pivoting the said pintle member between an unlatched position and a latched position, the said side and end walls having slot portions through which the said rod member passes as it moves between unlatched and latched positions, a vertically projecting portion on the said frame structure having an opening therethrough separate from the said slot portions, and a detent carried by the said rod which extends through the said last mentioned opening in the latched position.

5. A latch mechanism as specified in claim **4** in which the said rod has secured thereto a stop member which abuts the end of the frame structure in the unlatched position and the side of the frame structure in the latched position.

6. A latch mechanism as specified in claim **5** in which the said rod has associated therewith a spring which urges the said stop member toward the said frame structure.

7. A latch mechanism as specified in claim **5** in which the said stop member has a guide portion thereon which projects upwardly above the frame structure in the unlatched position.

8. A latch mechanism as specified in claim **5** in which the said stop member has a handle portion secured thereto.

9. A latch mechanism as specified in claim 7 in which the inner end of the said rod member has means thereon for releasably connecting the rod to the said frame structure.

10. A latch mechanism as specified in claim 9 in which the said releasable mechanism comprises a transverse pin through the rod and a key slot in a brace member of the said frame structure through which the said pin may pass.

11. A latch mechanism as specified in claim 4 in which the said vertically projecting portion on the frame structure has a guide portion thereon which projects upwardly above the frame structure.