Feb. 25, 1964 L. B. JONES 3,122,252

CLAMP ARM QUICK CHANGE FIXTURE

Filed Oct. 30, 1961

Fig. 1

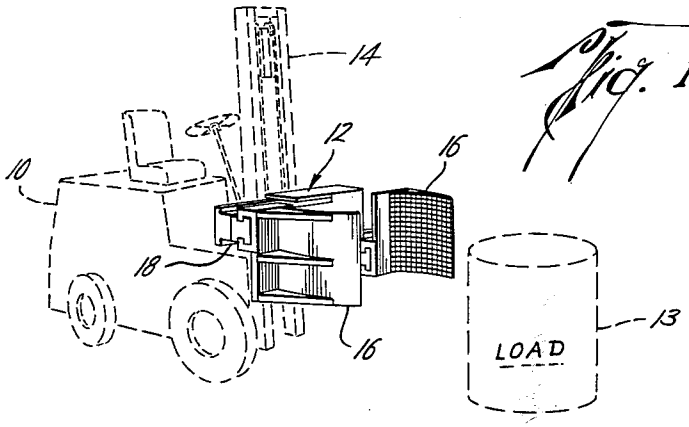


Fig. 2

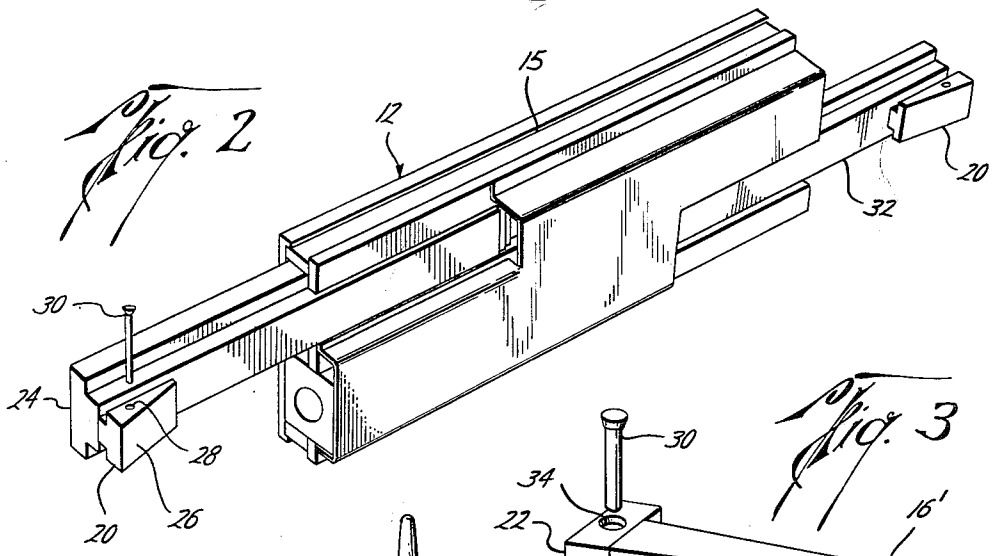


Fig. 3

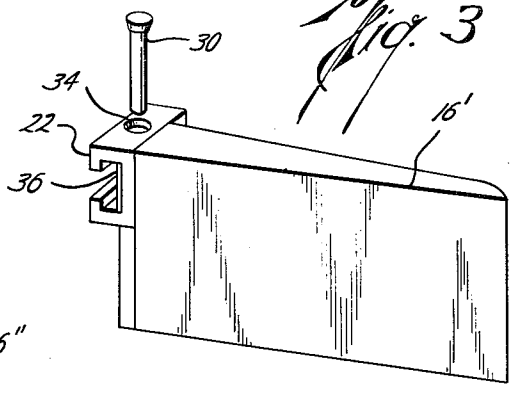
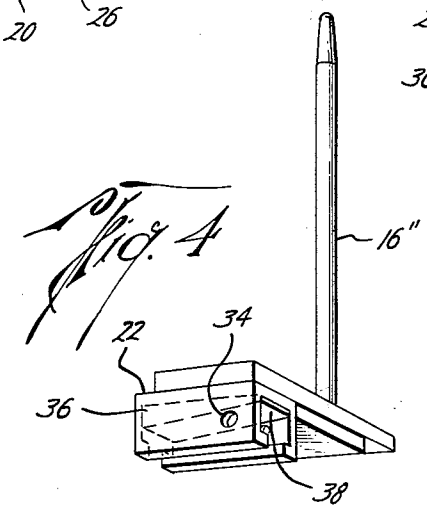


Fig. 4



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United States Patent Office 3,122,252 Patented Feb. 25, 1964

3,122,252

CLAMP ARM QUICK CHANGE FIXTURE

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Filed Oct. 30, 1961, Ser. No. 148,596
3 Claims. (Cl. 214—750)

The present invention relates to an improved fixture for use with industrial lift trucks or the like, and more specifically to an improved fixture for use with clamps mounted on such trucks in releasably securing load transporting arms to clamp frames.

In the past lift trucks have generally been provided with an assortment of clamp arms designed specifically for lifting and transporting assorted loads, such as cotton bales, barrels, pallets, boxes, cylinders and cartons. Often these arms are interchangeable on a particular clamp frame so that one lift truck may be used for a variety of jobs. In the past these arms have been attached to the clamp frame with from eight to ten bolts. Therefore, in order to interchange from one type of arm to another, it is necessary to remove these bolts, take off the first type of arm, and replace it with the second type of arm, then re-insert the bolts and tighten them securely. It is therefore obvious that the prior devices required a good bit of time and effort.

The present invention is directed to a fixture means whereby various interchangeable arms of a clamp may be efficiently and quickly interchanged on a clamp frame with a minimum of time and effort, and which fixture will hold the arm securely for use in the desired manner.

It is therefore an object of the present invention to attain the aforementioned advantages particularly through the use of a quick change fixture which will securely hold the load transporting arms.

It is a further object of the present invention to provide a quick change fixture which includes slidably interlocking, mating, wedging surfaces to securely hold the arm in place.

Yet another object of the present invention is to provide a quick change fixture which provides mating T-head bars and T-slot bars with inclined surfaces therein and includes a simple fastening means, such as a pin, to retain the interchangeable arms on the lift truck or the like.

A further object of the present invention is to provide an improved clamp for use with industrial trucks or the like which includes a clamp frame, clamp arm and quick change fixture, the fixture capable of releasably securing various arms to the frame.

Other and further objects, features and advantages will be apparent from the following description of the presently preferred embodiment of the invention, given for the purpose of disclosure, and taken in conjunction with the accompanying drawings, where like character references designate like parts throughout the several views, and where:

FIGURE 1 is a perspective view showing a lift truck with the present invention installed thereon, with the particular arms designed to lift and carry barrels,

FIGURE 2 is a perspective view of the present invention attached to a conventional hydraulic lift truck clamp frame mechanism,

FIGURE 3 is a perspective side view of a bale arm with the quick change fixture of the present invention installed thereon, and

FIGURE 4 is a perspective top view of the invention as shown in FIGURE 3 when utilized with a bar arm.

The invention in a quick change fixture for use with lift and other industrial trucks generally comprises slidably interlocking members, such as a T-head bar and a mating

T-slot bar, each of which includes mating wedging surfaces wherein one of said members is secured to the clamp frame and the other of said members is secured to the load transporting arm so that when load is supplied to the arm the wedging surfaces wedge tightly to securely hold the first member to the second member. The invention also includes a fastening means such as a pin, to prevent accidental release of the arm from the clamp frame when a load is not being transported.

Referring now to the drawings, and particularly to FIGURE 1, a conventional industrial truck **10** is shown having a conventional industrial clamp **12** attached to the vertical standard **14**. Extending from the industrial clamp **12** is a pair of arms **16** between which a load, shown as a barrel **13**, may be grasped, lifted, and transported. The particular arms **16** shown in FIGURE 1 are designed for carrying barrels, while the arms **16'** shown in FIGURE 3 are designed for carrying cotton bales, and the arms **16''** shown in FIGURE 4 are for pallets or the like. The conventional industrial clamp **12** also generally includes a frame **15** with two oppositely extensible guides **24** and **32**, and such a device is seen in the patent to Sinclair, No. 2,746,630 of May 22, 1956, although only one of the guides need be extensible. The present invention is directed to the quick change fixture **18** for attaching the arms **16** to the industrial clamp frame **15**.

Referring now to FIGURES 2 and 3, the quick change fixture **18** generally includes slidably engaging and interlocking members, herein shown as T-head bar **20** and T-slot bar **22**. In the disclosure herein given, the T-head bar **20** is shown fixedly attached to an extensible guide **24** of the industrial clamp frame **15**, while the T-slot bar **22** is shown fixedly attached to an appropriate arm **16**. However, it will become apparent hereinafter that the T-head bar and the T-slot bar may be interchanged.

The T-head bar **20** has an inclined outer surface **26** so that the thickness of the T is greatest at the side opposite where the load will be when the arm **16** is attached. Extending transversely of the long axis and through the T-head bar **20** is a hole **28** into which the pin **30** may be dropped. The opposite guide **32** of the industrial clamp frame **15** is fitted with a similar T-head bar **20**.

Referring now to FIGURE 3, attached to the arm **16'** is the T-slot bar **22**, whose slot is designed to interlock or mate with the T-head bar **20** previously described with reference to FIGURE 2. Extending transversely of the long axis and through the T-slot bar **22** is a hole **34** of approximately the same diameter as the hole **28** previously described with reference to the T-head bar **20** and likewise designed to accommodate the pin **30**. The T-slot bar **22** includes a wedge **36** fixedly attached to the head of the T-slot. The wedge **36** is more clearly seen by referring to FIGURE 4 and has an outer surface **38** designed to match with the surface **26** on the T-head bar **20** previously described when the T-slot bar **22** is slidably engaged with the T-head bar **20**.

In use, the T-head bars are fixedly attached to the extensible guides **24** and **32** of the industrial clamp frame **15** with the inclined surfaces **26** facing outwardly and with the thinner sections of the T facing the position of the load to be transported. In a similar manner, the mating T-slot bars **22** are fixedly attached to the appropriate arms **16** with the inclined surfaces **38** of the wedges **36** positioned to mate with the inclined surfaces **26** of the T-head bars **20**. Thereupon, the arms **16** with the attached T-slot bars **22** are slid over the T-head bar **20**, and thus engaging and interlocking therewith, until the inclined surfaces **38** and **26** mate and thus secure the T-head bar **20** and T-slot bar **22** together. Thereupon, the pin **30** is dropped through the mating holes **34** and **28** to prevent the accidental release of the arms **16** from the industrial clamp frame **15**. It is thus advantageously

seen that by the use of fixture 18, the arms 16 are quickly and simply attached to the frame 15 to form the industrial clamp 12, with a minimum of time and effort. Furthermore, the arms 16 may be quickly interchanged with other arms, such as 16' or 16", by a simple reverse of the steps heretofore mentioned and the substitution of the other arms 16' or 16".

The pin 30 is utilized as a fastening means to secure the arms 16 to the industrial clamp frame 15 when no load is being transported by the truck 10. It is apparent that many other forms of fastening means may be utilized, particularly should it be desirable to rotate the industrial clamp 12 in a conventional manner. In this situation, a conventional nut and bolt or the like (not shown) may be substituted for the pin 30.

The purpose of the mating inclined surfaces is to wedge the T-head bar 20 securely with the T-slot bar 22. Further, this wedging action should take place when the bars are in such a position that a load is being grasped by the arms 16. It is for this reason that the inclined surfaces are positioned to wedge the bars when the extensible guides 24 and 32 are moved to clamp the load. It is therefore apparent that the wedging action may be similarly effected by interchanging the T-head bar 20 with the T-slot bar 22, so long as the inclined surfaces 26 and 38 are directed to wedge the bars when a load is being clamped.

The disclosure described and shown in the drawings of the clamp 12 includes only one fixture 18 for each arm 16. It is apparent, however, that additional fixtures 18 may be utilized stacked either vertically or horizontally, should the particular load to be transported so require.

The present invention, therefore, is well adapted to carry out the objects and attain the ends and advantages mentioned as well as others inherent therein. While a presently preferred embodiment of the invention has been given for the purpose of disclosure, numerous changes in the details of construction and the combination, shape, size and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereafter claimed.

What is claimed is:

1. The combination with an industrial truck clamp having extensible guides and a pair of opposed elongate load transporting arms of a quick change fixture for releasably securing each of the arms to the clamp, each fixture including

a T-head bar,

a T-slot bar,

the T-head bar having an inclined surface,

the T-slot bar engageable with the T-head bar and having an inclined surface mating and wedging with the T-head bar inclined surface when both said bars are engaged,

one of said bars attached to said guide and the other of said bars attached to one end of said arm,

the height of said bar being short of the full height of said arm where attached, and

the inclined surfaces of the bars attached to the guides facing inwardly and wedging the arms to the guides, when a load is grasped by said clamp upon actuation of said guides.

2. The invention of claim 1 including the bars of each fixture having mating holes therethrough when said surfaces are wedged, and securing means arranged to pass through the mated holes.

3. The improvement in a clamp for transporting loads on an industrial truck comprising:

an extensible clamp frame attachable to the truck,

elongate load transporting clamp arms,

a quick change fixture interconnecting each arm perpendicular to the frame,

said fixture including a first member attached to the frame,

a second member attached to and extending less than the full height of one end of the arm,

one of said members being T-shaped and the other having a T-shaped slot,

said second member slidably and interlockingly engageable with the first member,

said first and second members including mating inclined wedging surfaces,

the wedging surface on said first member facing inwardly, and

said second member, when slidably and interlockingly engaged with said first member, wedging with said first member as a load is grasped between said arms by the clamp, thereby releasably securing the arm to the clamp.

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