The invention relates to hoisting fixtures, and more particularly to a split-ring clamp capable of side attachment to an elongate article to be hoisted and which will enable the article to be rotated throughout a 360° roll.

In the article-handling art it frequently becomes necessary to lift an elongate article, such as a tube, a shaft or a missile for positioning with respect to a part to which it is to be mounted; for supporting on a stand, or for similar purposes. Such an article to be handled may be relatively long or supported on a stand such that it is not practical to slip the clamp or fixture over one end of the article to position the fixture at the desired hoisting location.

In addition, it may be desired to roll the hoisted article through a 360 degrees roll for alignment, inspection, or some other purpose.

None of the prior art fixtures are capable of performing the above-described tasks.

Accordingly, one object of my invention is to provide a supporting fixture that can be attached from one side of the elongate article that it is to support, and a corollary object is to provide such a fixture that can be resiliently clamped to said article that, will enable the article to be rolled 360 degrees;

A further object is to provide a support fixture that can be opened for attachment around the article and without having disconnected or loose parts;

Still other objects are to provide a support fixture that will function under radial and thrust loads; and that can be attached and disconnected conveniently, quickly and safely.

Other objects, advantages and novel features of the invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings wherein:

FIG. 1 is an exploded perspective view of the invention clamp, in an open position, being lowered for attachment from a side of the stand-supported article to be lifted;

FIG. 2 is a similar view of FIG. 1 with the article being supported by the invention clamps from a sling;

FIG. 3 is an enlarged side elevation view of the invention clamp with the pair of pivotal sections shown by solid lines in a closed position and in an open position in broken lines;

FIGS. 4, 5 and 6 are sectional views taken along lines IV—IV, V—V, and VI—VI, respectively, of FIG. 3; and

FIG. 7 is an end view of the invention clamps with the pivotal sections in a closed position.

Referring to the drawings where like reference numerals refer to similar parts throughout the figures there is shown in FIGS. 1 and 2, a split-clamp 10 constructed according to the teaching of this invention suspended by a conventional sling 12. The lower end of clamp 10 comprises a pair of hinged sections 14 and 16 hinged on axes 18 and 20, respectively, to facilitate attachment from a side of a cylindrical article 22 (see FIG. 2) as it rests on a stand 24. When the hinged sections 14 and 16 are closed and secured about article 22, the clamped article can be lifted by sling 12. The invention clamp enables the article to be rotated about its longitudinal axis throughout a 360° roll, and, as example as shown in FIG. 2, for insertion or aligning into a cylinder 26 or assembly to any other article or handling maneuver that may be required, and in a manner presently to be described.
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race 28 of pivotal section 14. The inner and outer races of pivotal section 16 are provided with corresponding pairs of ears 68 between which is received each swing bolt and against which the threaded nut 70 on each swing bolt is tightened to secure the pivotal sections 14 and 16 in closed position about which the clamp is positioned.

The clamp can be suspended by a sling 12 by providing a pair of trunnions 72 attached to opposite sides of the main body of clamp 37. The trunnions, as illustrated in FIG. 7, can be each integral with a plate 74 which is adjustably positioned on bar 76 secured to the clamp, or the trunnion can be attached directly to main portion 37 of the clamp.

The operation of the split ring clamp 10 is obvious from FIGURES 1 and 2. To secure the clamp over article 22, swing bolts 64 and 66 are loosened to enable pivotal sections 14 and 16 to fall apart as shown in FIG. 1, sufficiently spaced to receive the article therebetween. Pins 54 maintain both the inner and the outer race components of sections 14 and 16 in alignment during the opening and closing operation. As the mouth formed by the main section 37 of the clamp is greater than the diameter of article 22 the clamp can be slipped over the article from one side. When the main section of the clamp is resting on the article, the pivotal sections are swung back in position and secured around the article by swing bolts 64 and 66. Inflatable tubes 45 frictionally engage the article to enable the assembly of inner race 28 and the article to rotate together within outer race 30 when the latter is suspended by sling 12.

The invention split-clamp enables an article to be easily secured from one side. The clamp will enable the article supported by the clamp to be rolled throughout 360° for alignment or similar purposes. The clamp is of simple and inexpensive construction, and can be opened up as a unitary structure without the problem of handling or losing disconnected parts. By providing two pivotal sections, a sufficient opening in the clamp is assured to enable the open clamp to be simply lowered over the article to be lifted.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described:

1. A split-clamp for hoisting an elongate article comprising:
   a. A clamp body adapted to encircle the article including:
      an inner bearing race having a bore configuration generally conforming to the outer configuration of the article;
      a resilient member supported by the inner race and projecting radially inwardly beyond the bore surface to frictionally engage the article;
      an outer bearing race circumscribing the inner race;
      a plurality of spaced bearings disposed between said races to permit relative rotary movement therebetween;
   said clamp body formed into a main section having a mouth opening slightly larger than the outer configuration of the article to enable the clamp body to be positioned around the article from a side thereof;
   said clamp body having at least one openable section pivotally secured to the main section for closing the mouth opening with the article positioned in the clamp;
   means for securing the openable section in a closed position;
   whereby the clamp can be attached to the article from one side, and, the article and the inner race can be rolled together 360° around the outer race;
2. The clamp of claim 1 wherein the outer bearing race is provided with oppositely disposed sling attaching means.
3. The clamp of claim 1 wherein the resilient member is an inflatable tube.
4. The clamp of claim 1 wherein two openable sections are provided, each section pivotally secured to opposite sides of the main section of the body.
5. The clamp of claim 4 wherein the main body section and each of the openable sections are each provided with a bearing disposed between said races to permit relative rotary movement therebetween.
6. A split-clamp for hoisting an elongate article comprising:
   a. A clamp body adapted to encircle the article including:
      an inner bearing race having a bore configuration generally conforming to the outer configuration of the article;
      a resilient member supported by the inner race and projecting radially inwardly beyond the bore surface to frictionally engage the article;
      an outer bearing race circumscribing the inner race;
   oppositely disposed sling attaching means secured to the outer race;
   a plurality of spaced bearings disposed between said races to permit relative rotary movement therebetween;
   said clamp body formed into a main section having a mouth opening slightly larger than the outer configuration of the article to enable the clamp body to be positioned around the article from a side thereof;
   said clamp body having a pair of openable sections pivotally secured to opposite ends of the main section for closing the mouth opening with the article positioned in the clamp;
   means for securing the openable sections in a closed position;
   whereby the opened clamp can be attached to the article from one side and with the clamp closed the article can be rolled with the inner race 360° around the outer race.
7. The split clamp of claim 6 wherein:
   each openable section has a separate hinge for the inner race portion and the outer race portion of the openable section; and
   means for aligning the hinges to retain the hinge center lines in the same axis when the sections are opened.
8. The split clamp of claim 7 wherein each openable section is provided with a bearing between the inner race portion and the outer race portion of the openable section.
9. A split-clamp for hoisting an elongate article comprising:
   a. A clamp body adapted to encircle the article including:
      an inner bearing race having a bore configuration generally conforming to the outer configuration of the article;
      a resilient member supported by the inner race and projecting radially inwardly beyond the bore surface to frictionally engage the article;
      an outer bearing race circumscribing the inner race;
      a plurality of spaced bearings assemblies disposed between said races to permit relative rotary movement therebetween;
   said clamp body formed into a main section having a mouth opening slightly larger than the outer configuration of the article to enable the clamp body to be positioned around the article from a side thereof;
   said clamp body having at least two openable sections pivotally secured to opposite ends of the main section for closing the mouth opening with the article positioned in the clamp;
   means for securing the openable sections in a closed position;
   one bearing assembly being located in each of the main section and openable sections;
each bearing assembly including a pair of rollers having rotational axes angularly disposed with each other; whereby the opened clamp can be attached to the article from one side and with the clamp closed the article can be rolled with the inner race 360° around the outer race.

10. A split-clamp for hoisting an elongate article comprising:

a clamp body adapted to encircle the article including

an inner bearing race having a bore configuration generally conforming to the outer configuration of the article;
said inner race having an annular groove on the periphery thereof;
a resilient member supported by the inner race and projecting radially the bore surface and adapted to engage the article;

an outer bearing race circumscribing the inner race and sealed within said annular recess;
a plurality of spaced roller bearings assemblies disposed between said races to permit relative rotary movement therebetween;
each assembly including a pair of rollers rotatably mounted in opposing relation on an axis disposed at approximately a 45° angle with the vertical;

said outer bearing race having a pair of complementary bevelled surfaces for engaging said pair of rollers;
said clamp body formed into a main section having a mouth opening slightly larger than the outer configuration of the article to enable the clamp body to be positioned around the article;
said clamp body having an openable section pivotably secured to the main section for closing the mouth opening with the article positioned in the clamp;
means for securing the openable section in a closed position;
whereby the opened clamp can be attached to the article from one side and with the clamp closed the article can be rolled with the inner race 360° around the outer race.

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