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(54) IMPROVEMENTS IN OR RELATING TO EJECTORS FOR  
 RELEASABLY TRANSPORTING LOADS UNDER AIRCRAFTS,  
 WHETHER SAID LOADS ARE EQUIPPED WITH SUSPENSION  
 RINGS OR BRIDGE-SHAPED SUSPENSION MEMBERS

(71) We, R. ALKAN & CIE, of Rue du 8 Mai 1945, 94460 Valenton, France, a French Body Corporate, do hereby declare the invention, for which we pray that a 5 patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

As a rule, loads carried under aircrafts 10 comprise a pair of tapped holes, disposed along a common longitudinal generatrix at a standard relative spacing. Ring means are screwed in said holes for suspending the load under carrier devices provided with 15 hook means adapted to engage said ring means.

In certain cases and according to an increasingly popular technique, so-called "saddles" (which are in the form of bridge-shaped suspension members) are substituted 20 for the ring means. Each saddle comprises on the one hand a pair of opposite lateral recesses engageable by the two noses of a twin hook and on the other hand a flat 25 top surface adapted to hold the suspended load against lateral motion by means of wedge members. Moreover, these saddles comprise a substantially cylindrical cavity which serves to center a respective male 30 cylindrical member rigid with the carrier devices or mechanism so as to prevent longitudinal and transverse movements of translation, as well as any yawing, of the suspended load.

35 Air craft operators may be led to use either loads equipped with rings, or loads equipped with said saddles. The Applicant has already filed on June 23, 1976 a patent application No. 26081/76 (Serial No. 40 1523384) reciting a device for carrying loads equipped with either of the above-mentioned systems, and characterised in that said device included a dual purpose hook that must be turned one way or the other so 45 that its operative face offers either a single

hook or a twin hook, according to the type of carrier system to be coped with.

The present invention is concerned with a device also capable of carrying loads, whether the latter comprise suspension rings 50 or saddles, but in addition the device of this invention incorporates complementary lateral wedging elements for use only with ring-type load suspension means.

According to the present invention we 55 provide an ejector for carrying loads under aircraft, where such loads are equipped either with suspension rings or suspension members in the form of bridge-shaped pieces, said ejector comprising a carrier device with pivoted fork-shaped hooks, each adapted to co-act, in use, with a bridge-shaped suspension member on the load, centering members removably securable to the carrier device, each centering member 60 being associated with one of said fork-shaped hooks and presenting a vertical lower portion adapted to engage the bridge-shaped piece of the associated suspension member, and bracket members removably 65 securable to the carrier device instead of the centering members, each bracket member being associated with one of said fork-shaped hooks and having pivoted thereto a single hook urged by spring means to en- 70 gage said fork-shaped hook so that actuation of the fork-shaped hook causes pivoting of the single hook between an open position and a closed position in which this single hook respectively releases and retains 75 the suspension ring of the load, the arrangement being such that when the load to be carried is equipped with bridge-shaped suspension members, the centering members can be secured to the carrier device while, 80 when the load to be carried is equipped with suspension rings, the centering members can be removed and replaced by the bracket members.

A typical release mechanism ejector 90

according to this invention will now be described by way of example, not of limitation, together with a modified form of embodiment thereof, with reference to the 5 attached drawing, in which:

Figure 1 is a side-elevational, part sectional view, with a central portion broken away, of a release mechanism ejector normally designed for carrying loads equipped 10 with so-called "saddle" members, and comprising detachable centering cylindrical members;

Figure 2 illustrates in longitudinal section the detachable device adapted to be substituted for the centering member;

Figure 3 is an end view of the same device;

Figure 4 illustrates in fragmentary side elevational view and parts broken away a 20 modified ejector also comprising detachable cylindrical members intended for use of the so-called "saddle" members;

Figure 5 illustrates in side elevational view a detachable device similar to the one 25 illustrated in Figures 2 and 3, with a different fastening system; and

Figure 6 illustrates the same device shown in end view together with its securing means.

Referring first to Figure 1, the reference 30 numeral 1 designates the release mechanism which is no part of this invention, 2 and 3 designating twin hooks corresponding to the so-called "saddle" members already disclosed in British Patent No. 1 412 083 35 and referred to therein as "bridge pieces or members". The assembly illustrated further comprises detachable centering members 4,5 of which the screw-threaded portions 6 and 7 are intended for fastening 40 the carrier device to the aircraft; however, these fastening means may differ therefrom, as will be explained presently.

Figure 2 illustrates a support or bracket adapted to be substituted for the centering 45 members 4 and 5. This bracket 8 comprises a screw-threaded portion 6 corresponding to a similar portion 6 or 7 of the centering members 4 and 5 of Figure 1. A single hook 9 corresponds to the ring 10 secured 50 to the load. A spring 11 constantly urges the heel 12 of hook 9 for engagement with the twin hook 2 between the two noses constituting said twin hook. A notch 13 formed in bracket 8 is engageable by said ring 10 55 and permits the insertion of the nose portion 14 of the hook 9 into the eye of ring 10.

A pivot pin 15 is secured to a strap 16 in which the hook can oscillate according to the position of the twin hook 2.

In Figure 3 the bracket 8 is shown with its arm-forming lateral extensions 17, 18 carrying at their outer ends wedging screws 21 of known type.

In Figure 2 the phantom lines illustrate 65 one fraction of the main structure of the

release mechanism 1 equipped with the device 8, the same Figure showing in section and thick lines at 19 the extension of this mechanism which receives said bracket 8 as a substitute for the centering member 4, 70 said bracket 8 being secured by a screw 20 and also retained by the heel 12 of hook 9 engaging the twin hook 2.

The mode of operation of this mechanism which results from the fitting of bracket 75 member 8 will be readily understood.

Urged by spring 11, the single hook 9 follows the twin hook 2 during its movements caused as usual during the load coupling or jettisoning operations. Thus, 80 the hook 9 engages the ring 10, or escapes therefrom, without any particular complications.

The arrangement is such that, when the rings 10 are received within the notches 85 13 and are engaged and held therein by the hooks 9, the rings 10 and hence the load carried thereby is held against movement in the longitudinal direction.

Moreover, when the load is suspended by 90 means of its rings 10, any lateral oscillation of the load is positively prevented by the jack-forming wedging screws 21.

Of course, the initial condition illustrated in Figure 1 is restored when disassembling 95 the bracket 8 and the single hook 9 associated therewith, and also when this bracket 8 is replaced by the initial centering members such as 4 and 5.

It will be seen that the carrier device is 100 secured by means of screw-threaded portions 6 and 7 but this fastening procedure requires the disassembling of the carrier device for exchanging the detachable members. In an alternative arrangement, the 105 carrier device is secured to the aircraft structure by means of transverse bolts 22 and 23 (Figure 4). The detachable centering members 24 corresponding to members 4 and 5 of Figure 1 are themselves secured 110 to the carrier device by means of vertical screws 25.

In Figure 5 there is shown at 28 a bracket corresponding to the bracket 8 of Figures 2-3, which is also interchangeable 115 with the detachable member 24 and comprises, like said bracket 8, a single hook 9 with its heel 12, a notch 13 and a pivot pin 15 secured to a strap 16. Additionally, a member 26 formed integrally with said hook 120 9 and engaged by a return piston 27 may be provided, this return piston being responsive to a compression spring 29 so as to keep the heel 12 in engagement with the twin hook 2. This spring 29 engages the 125 bottom of piston 27 and reacts against a screw plug 30 fitted in the upper end of bracket 28.

Figure 6 illustrates the lateral arms 17, 18 and the wedging screws 21 formed in- 130

tegrally with bracket 28 in this case. A pair of vertical screws 31, 32 are provided for securing the bracket 28 to the carrier device 1 by engaging the corresponding 5 tapped holes formed in the lateral projections 33 and 34 of the ejector.

It is unnecessary to describe in detail the mode of operation of this modified structure, since this operation is the same as that 10 of the preceding form of embodiment. Its principle advantage lies in the fact that the operator may change from one carrier version to another without disassembling the carrier device.

15 Of course, no preliminary disassembling operation is required for reaching the fastening screws 25 of the centering members, and also the fastening screws 31, 32 of brackets 28 disposed beneath the carrier 20 device 1.

WHAT WE CLAIM IS:—

1. An ejector for carrying loads under aircraft, where such loads are equipped either with suspension rings or suspension 25 members in the form of bridge-shaped pieces, said ejector comprising a carrier device with pivoted fork-shaped hooks, each adapted to co-act, in use, with a bridge-shaped suspension member on the load, 30 centering members removably securable to the carrier device, each centering member being associated with one of said fork-shaped hooks and presenting a vertical lower portion adapted to engage the bridge-shaped piece of the associated suspension member, and bracket members removably securable to the carrier device instead of the centering members, each bracket member being associated with one of said fork- 35 shaped hooks and having pivoted thereto a single hook urged by spring means to engage said fork-shaped hook so that actuation of the fork-shaped hook causes pivoting of the single hook between an open 40 position and a closed position in which this single hook respectively releases and retains 45

the suspension ring of the load, the arrangement being such that when the load to be carried is equipped with bridge-shaped suspension members, the centering members 50 can be secured to the carrier device while, when the load to be carried is equipped with suspension rings, the centering members can be removed and replaced by the bracket members.

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2. An ejector according to Claim 1, in which each bracket member has a notch formed therein so that when, in use, the single hook is in the closed position, the suspension ring of the load is trapped within 60 said notch.

3. An ejector according to Claim 1 or 2, in which each bracket member comprises laterally projecting arms provided with adjustable means for co-operation with the 65 load, in use, to steady the same.

4. An ejector according to any one of the preceding claims, in which the centering members and the bracket members comprise screw-threaded portions for screw-thread 70 engagement with the carrier device.

5. An ejector according to any of Claims 1 to 3, in which the centering members and the bracket members are secured by means of screws to said ejector so that replacement of the centering members by the bracket members and vice versa is made possible without having first to disassemble the ejector carrier device from the aircraft. 75

6. Ejector according to Claim 1, substantially as hereinbefore described with reference to, as and as show in, Figures 2 and 3 or Figures 4 and 6 or Figures 4 and 6 as modified by Figure 5 of the accompanying drawings. 80

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COMPLETE SPECIFICATION

4 SHEETS

*This drawing is a reproduction of  
the Original on a reduced scale*

Sheet 1







