

Coupling**DESCRIPTION:**

The invention relates to couplings.

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When trailers such as boat trailers or caravans are towed by a vehicle, the primary coupling is between a tow bar with a socket mounted on the trailer and a ball mounted on the towing vehicle. However, there are often provided in addition safety chains which are mounted on the trailer. The safety chains are connected to the towing vehicle at a point adjacent the towing ball by means of shackles.

The use of shackles to connect the safety chain can be highly inconvenient. For example, the shackles include threaded connections which can become rusted in use and it is very time consuming to fasten and undo the threaded connections. Also, the nuts of the threaded connections are easily lost.

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The present invention provides a coupling for a chain which is easier to use than shackles whilst providing an efficient couple.

25 In accordance with the present invention there is provided a coupling member which comprises a flat slotted member containing an elongated slot and a pair of flat key members, wherein each key member comprises a wide body portion, an intermediate narrow neck portion and a wide flat bar portion generally at right angles to the neck portion and at an end remote from the wide body portion, the wide body portion of each key member is attached to a respective flexible element, and the slot of the slotted member is arranged to be oriented vertically in use and contains an enlarged portion which is at the lowermost end

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- of the slot, the enlarged portion being so dimensioned that a neck portion of one key member at a time can be rotated in it but the remainder of the slot being too narrow to allow rotation of the neck portion, such that the key members can be engaged sequentially with the slot by aligning each in turn of the bar portions with the slot, pushing each bar portion through the slot, moving the neck portion until it is in the enlarged portion of the slot and rotating each key member so that its bar portion engages behind the slotted member. The slotted member is typically arranged to be affixed to a towing vehicle or a stationary article while each key member is typically arranged to be affixed to a chain or other non-rigid connecting means.
- 15 The present invention will be described with particular reference to safety chains for use with trailers coupled to a towing vehicle but it should be appreciated that it is of general applicability. For example, it could be used in relation to a gate to provide a means for ensuring that the gate remained closed. Also, the slotted member could be built into the front of a boat and the key members inserted into the slotted member. Each key member would be attached to a chain mounted on a winch so that the coupling member could be used to winch the boat onto a trailer.
- 25 Preferably, the slotted member would be rounded to form a horseshoe or half-moon shape for safety reasons.

Typically, a trailer comprises a pair of lengths of chain extending from its forward end. In the present invention, a key member is affixed to the free end of each length of chain. Preferably, each key member is stamped out of metal.

Conveniently, each key member is affixed at its first end to the free end of a length of chain by welding.

Preferably, the body portion of the key member is shaped to conform with the shape of the end link of the length of chain to provide a strong weld joint.

- 5 The slotted member is preferably affixed to the towing vehicle and is flat and may be stamped out of metal. The slot in the slotted member is elongated to enable the bar portion of each key member to be passed through it. Further, the slot is preferably arranged to be
- 10 substantially vertical in use. Still further, the slot preferably contains an enlarged portion. The enlarged portion is so dimensioned as to enable the neck portion to be rotated within the slot after the bar portion has been passed through the slot. The remainder of the slot is
- 15 preferably so dimensioned as to prevent rotation of the neck portion within it.

In use, a trailer typically has two chains with respective free ends or a single length of chain with two free ends.

- 20 In either case, a similar key member is affixed to each end as described above.

- To affix the chains to the towing vehicle the key members are engaged with the slotted member by inserting each bar
- 25 portion through the slot so that the neck portion is within the slot, and then partially rotating the neck portion for example through 90° , within the slot so as to cause the bar portion to engage behind the slotted member.

- 30 As described above, the slot is vertical in use, so that the two key members normally rest one above the other in the bottom of the slot. Therefore, one bar portion may be shorter than the other bar portion. In use, the shorter bar portion key member is preferably disposed below the
- 35 longer bar portion key member in the slot.

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- 4 -

Further, the length of the slot is preferably such that only the shorter bar portion can be rotated and removed through the slot when the two key members are engaged with the slotted member. Thus, the larger bar portion cannot be removed when the shorter bar portion is in its engaged position. When the longer bar portion is overlying the shorter bar portion it tends to hold the shorter bar portion down and prevent it being inadvertently rotated and disengaged. This is an added safety factor and has the advantage of making it difficult for children to disconnect the safety chain or chains from the towing vehicle.

DRAWINGS:

Figure 1 is a schematic side elevation of a coupling of the present invention in use in relation to a towing vehicle and trailer combination;

Figure 2 is a sectional end elevation through a tow bar and slotted member of Figure 1 with a pair of key members in place;

Figure 3 is an upper perspective view of the tow bar and slotted member assembly of Figure 2; and

Figure 4 is an upper perspective view of a modified form of key member for use in a coupling in accordance with the present invention.

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In Figures 1 to 3, there is shown a tow bar 10 which is typically attached to a towing vehicle in conventional manner. Underneath the tow bar 10 there is welded a flat slotted metal member 12 provided with a vertical slot 14.

The slot 14 has an enlarged portion 16 at its bottom end. The member 12 is conveniently stamped out of metal.

There is also shown a pair of chains 18 attached to a trailer 20 (only part of which can be seen). Each chain 18 has a free end and a flat metal key member 22 is welded to

each free end. Each key member 22 comprises a wide body portion 24 at a first end, an intermediate narrow neck portion 26 and a wide bar portion 28 extending at right angles to the neck portion at a second end. The key members 22 are conveniently stamped out of metal.

To attach the chains 18 to the tow bar 10, the key members 22 are inserted sequentially in the slot 14. To do this a first key member 22 is presented to the slot 14 with the bar portion 28 aligned with the slot 14. The key member 22 is then lowered until the neck portion 26 is in the enlarged portion 16 of the slot 14. The key member 22 can be rotated so that the bar portion 28 is at right angles to the slot 14 (see Figures 2 and 3) and the key member is thus latched to the slotted member. Then, the first key member 22 is raised to the top of the slot 14 and a further key member 22 is presented in similar manner to the slot 14 preferably from the other side of the member 12 (see Figures 2 and 3). The further key member 22 is also inserted and rotated as described for the first key member 22 so that they lie one above the other in the slot 14. It should be noted that the neck portions 26 and slots 14 are so dimensioned that the key member 22 can only be rotated in the slot 14 in the enlarged portion 16 thereof. The fact that the two key members 22 lie one above the other in the slot 14 inhibits rotation of the lowermost key member 22 and thus reduces the possibility of its becoming accidentally disengaged. To remove the key members 22 from the slot 14, the reverse procedure to that described above is carried out.

Also, in the event that the tow bar becomes disengaged from the trailer in use, it is found that the chains 18 can act as a support for the front end of the trailer and prevent it from contacting the road at speed.

(17)

- 6 -

In Figure 4 there is shown a modified flat metal key member 40. The key member 40 is intended to replace a key member 22. The key member 40 comprises an intermediate wide body portion 42, and an intermediate narrow neck portion 44 adjacent the body portion 42. A wide bar portion 46 is located at one end of the key member 42 adjacent the narrow neck portion 44. The key member 40 is also conveniently stamped out of metal.

- 10 The key member 40 further comprises an aperture 48 adjacent the end of the key member 40 remote from the wide portion 46. Preferably, the outer end of the aperture 48 is defined by a curved loop 50.
- 15 Preferably, in the stamping process the loop 50 is formed with a substantially circular profile. This is because the aperture 48 is used to receive an open end link with a chain (not shown) comprising a series of links. The end link of the chain is closed such as by welding or any
- 20 equivalent known means once the open link has been passed through the aperture 48.

If loop 50 is too angular in cross-section it tends to be worn away at its corners by the chain links in use.

- 25 Therefore, the substantially circular profile is preferred to reduce this wear.

- The use of the aperture 48 obviates the need to weld the end link of the chain directly to the key member as is
- 30 described above in relation to Figures 1 to 3. It is found that the need to make this weld increases the cost of manufacturing the coupling member of the present invention to an unacceptable level because of the costly inspection procedures that are required. The use of the aperture 48
- 35 and the closing of an end link of a chain by known means is

(18)

- 7 -

a much more dependable procedure which reduces manufacturing costs substantially.

5 It is envisaged that the coupling member of the present invention could also be used as a lifting device and, as described above, for winching boats and for many other purposes.

10 Modifications and variations of the illustrated embodiments are possible. For example, the chains 18 could be replaced by any equivalent non-rigid connecting means.

109

- 8 -

CLAIMS:

1. A coupling member which comprises a flat slotted member containing an elongated slot and a pair of flat key members, wherein each key member comprises a wide body portion, an intermediate narrow neck portion and a wide flat bar portion generally at right angles to the neck portion and at an end remote from the wide body portion, the wide body portion of each key member is attached to a respective flexible element, and the slot of the slotted member is arranged to be oriented vertically in use and contains an enlarged portion which is at the lowermost end of the slot, the enlarged portion being so dimensioned that a neck portion of one key member at a time can be rotated in it but the remainder of the slot being too narrow to allow rotation of the neck portion, such that the key members can be engaged sequentially with the slot by aligning each in turn of the bar portions with the slot, pushing each bar portion through the slot, moving the neck portion until it is in the enlarged portion of the slot and rotating each key member so that its bar portion engages behind the slotted member.

2. A coupling member according to claim 1, wherein one of the key members has a bar portion which is shorter than the bar portion of the other of the key members, the bar portion of the one key member being of a length such that the one key member can be rotated when the other key member is located in the slot whereas the bar member of the other key member is too long for the other key member to be rotated in the slot when the one key member is located in the slot such that the one key member is arranged to be disposed lowermost in the slot.

3. A coupling member according to claim 1 or claim 2, wherein the wide body portion of each key member contains



an aperture adjacent an end of the key member, which aperture is arranged to receive an open link of a chain which link is subsequently closed.

5 4. A coupling member according to claim 3, in which the aperture is defined by a curved loop.

5. A coupling member according to claim 3 or claim 4 in which the aperture is defined by a curved loop of
10 substantially circular cross-section.

6. A motor vehicle and trailer combination provided with a tow bar for towing the trailer, said combination being provided with a coupling member as defined in claim 1 in
15 which flat slotted member is mounted on the tow bar and the flat key members are attached to the trailer by means of respective flexible elements.

7. A motor vehicle and trailer combination provided with
20 a tow bar for towing the trailer, said combination being provided with a coupling member as defined in claim² 1 in which the flat slotted member is mounted on the tow bar and the flat key members are attached to the trailer by means of respective flexible elements.

25 8. A coupling member substantially as hereinbefore described with reference to Figures 1 to 3 or Figures 1 to 3 as modified by Figure 4 of the accompanying drawings.

