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(54) **Improvements in locking devices
for tractor-trailer connections**

(57) A locking device, for attachment to the king pin of an articulated tractor-trailer connection, comprises two cooperating arms 10, 11 pivotally connected together and shaped to define between them an aperture which, in an open position of the arms, is open at one side to receive the king pin and, in a closed position of the arms, embraces the king pin. The ends of the arms remote from the pivotal connection 12 are formed respectively with first surfaces 16, 18, extending

transversely of the pivot axis, which are brought into overlying relationship with one another in the closed position, and second surfaces 17, 19, at right angles to the first surfaces respectively, which are brought into abutting relationship in the closed position. A key operated locking device is mounted on one arm 11 and has a movable detent which may be projected across said overlying first surfaces, when in the closed position, to prevent relative movement therebetween from the closed position. Each first surface 16, 18 lies wholly to one side of a plane passing through the pivot axis of the device and extending at right angles to the first surface.

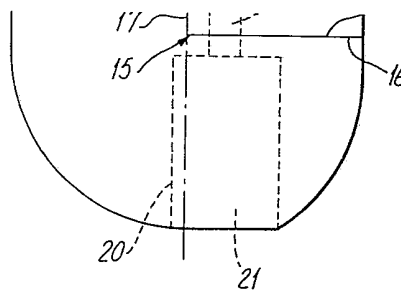
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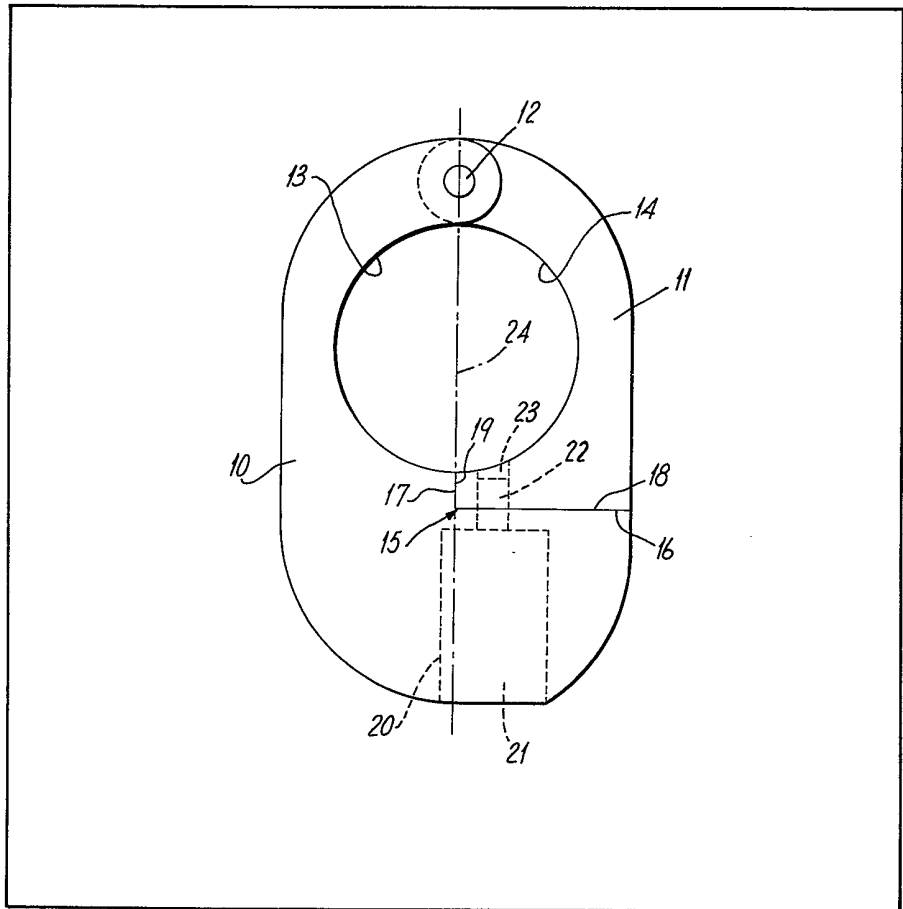


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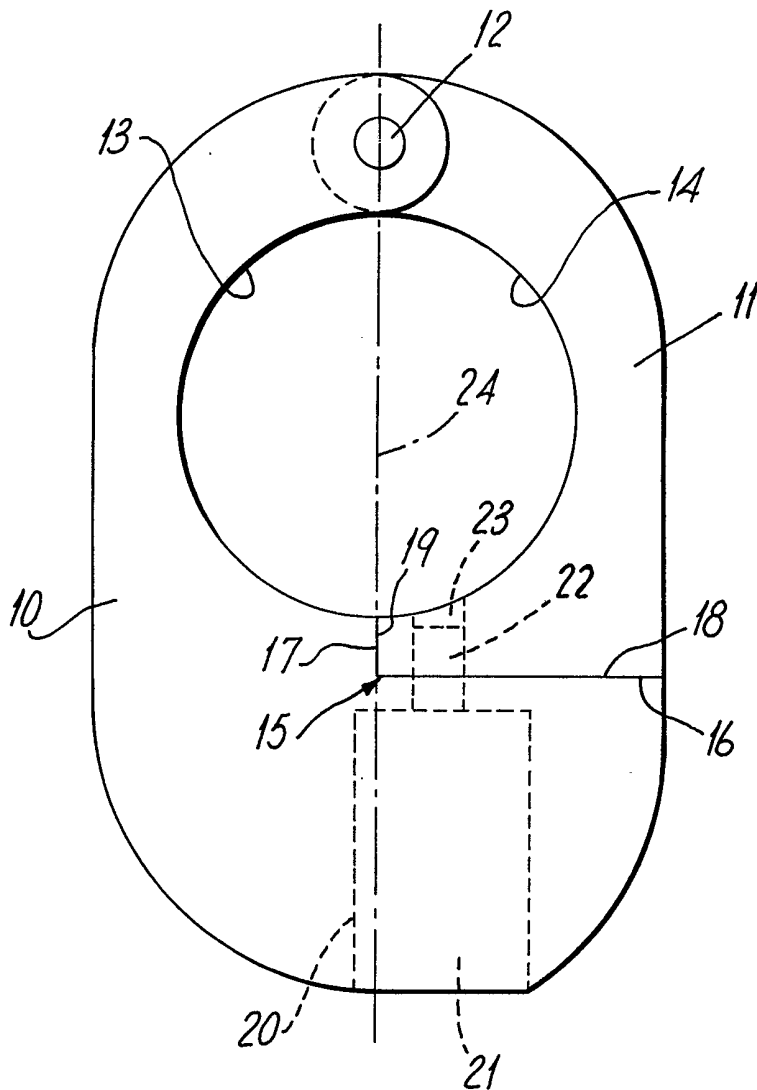
(54) **Improvements in locking devices for tractor-trailer connections**

(57) A locking device, for attachment to the king pin of an articulated tractor-trailer connection, comprises two cooperating arms 10, 11 pivotally connected together and shaped to define between them an aperture which, in an open position of the arms, is open at one side to receive the king pin and, in a closed position of the arms, embraces the king pin. The ends of the arms remote from the pivotal connection 12 are formed respectively with first surfaces 16, 18, extending

transversely of the pivot axis, which are brought into overlying relationship with one another in the closed position, and second surfaces 17, 19, at right angles to the first surfaces respectively, which are brought into abutting relationship in the closed position. A key operated locking device is mounted on one arm 11 and has a movable detent which may be projected across said overlying first surfaces, when in the closed position, to prevent relative movement therebetween from the closed position. Each first surface 16, 18 lies wholly to one side of a plane passing through the pivot axis of the device and extending at right angles to the first surface.



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THE FIG.

SPECIFICATION

Improvements in locking devices

5 The invention relates to locking devices, and in particular to a locking device for attachment to the king pin of an articulated tractor-trailer connection, of the kind comprising two cooperating arms pivotally connected together and shaped to define between them an aperture which, in an open position of the arms, is open at one side to receive the king pin and, in a closed position of the arms, embraces the king pin, the ends of the arms remote from the pivotal connection being formed respectively with first surfaces, extending transversely of the pivot axis, which are brought into overlying relationship with one another in the closed position, and second surfaces, inclined at an angle to the first surfaces respectively, which are brought into abutting relationship in the closed position, and key operated locking means mounted on one arm and having a movable detent which may be projected across said overlying first surfaces, when in the closed position, to prevent relative movement therebetween from the closed position.

A locking device of this kind is used for attachment to the king pin of an articulated tractor-trailer connection, when the tractor vehicle is disconnected from the trailer, in order to prevent an unauthorised person attaching another tractor vehicle to the trailer and removing the trailer.

In known locking devices of this type the relative dispositions of the first and second surfaces on the cooperating arms has been such that, in order to allow the arms to swing into the closed position, a significant clearance is necessary between the overlying first surfaces. There is thus a gap between these surfaces when the locking device is closed. The detent of the locking means extends across this gap and the device is therefore vulnerable to the insertion of a lever into the gap to break the detent and prise the two arms of the device apart. To prevent this, it has hitherto been necessary to form one of the arms, alongside the first surface thereof, with side flanges which overlap the other arm and thus extend across the gap between the two first surfaces. The necessary shaping of the arms to permit their swinging into engagement, and to provide these flanges, adds to the cost of manufacture of the locking device. The present invention sets out to provide an arrangement whereby the two cooperating arms of the locking device fit closely together in the closed position without complex shaping of the arms being necessary.

55 According to the invention there is provided a locking device of the kind referred to above, wherein each first surface lies wholly to one side of a plane passing through the pivot axis of the device and extending at right angles to the first surface.

60 With such an arrangement no clearance is required between the first surfaces to enable them to be brought into overlying relationship by the swinging movement of the arms. Consequently the fit between the first surfaces in the closed position may be such that it is impossible to insert a lever between

them to break the detent of the locking means and prise open the device.

70 Preferably the junction between each first surface and its associated second surface lies in said plane passing through the pivot axis of the device and extending at right angles to the first surface.

In a preferred version of the latter arrangement the second surfaces extend at right angles to the first surfaces respectively and thus lie in said plane passing through the pivot axis of the device.

75 The aperture defined between the cooperating arms may be circular and in this case the centre of the aperture preferably also lies in said plane passing through the axis of the device.

80 The following is a more detailed description of one embodiment of the invention, reference being made to the accompanying drawing which is a diagrammatic plan view of a locking device according to the invention.

85 The locking device comprises two cooperating arms 10 and 11 which are pivotally connected together by a pivot pin 12. The arms 10 and 11 are formed with semi-circular recesses 13 and 14 respectively which together define a circular aperture when the device is in the closed position, as shown in the drawing.

The arm 10 is formed with a rebate 15 into which the end of the arm 11 remote from the pivot pin 12 engages when the device is in the closed position.

95 The rebate 15 is formed from a first surface 16 and a second surface 17 on the arm 10, and the arm 11 is formed with corresponding first and second surfaces 18 and 19 respectively. The relative dispositions of these surfaces are very important, as will be explained below.

100 The arm 10 is formed with a cylindrical recess 20 which receives a standard cylinder plunger-type lock, the plunger 22 of which serves as a detent which projects across the overlying surfaces 16 and 18 and into a cylindrical bore 23 in the arm 11 when the device is locked in the closed position.

105 In operation, when it is wished to fit the locking device to the king pin of an articulated tractor-trailer connection, the lock 21 is operated with a key to withdraw the plunger 22 from the bore 23 permitting the two arms to be swung apart and the king pin to be received in the circular aperture defined by the recesses 13 and 14. The two arms are then swung together to the closed position shown in the drawing in which the surfaces 17 and 19 are in abutting relationship and the surfaces 16 and 18 overlie one another. The lock 21 is then operated to project the plunger 22 into the bore 23 to secure the device in the closed position. It will be appreciated that when the device is locked onto the king pin of a tractor-trailer connection it is impossible to connect a tractor vehicle to the trailer without first removing the locking device. This prevents unauthorised removal of the trailer.

125 In previously known locking devices of this general type, the shape of the rebate 15 in the arm 10 has been such that the overlying surfaces 16 and 18 have extending partly across the plane, indicated at 24, which extends through the axis of the pivot pin 12 and is at right angles to the surfaces 16 and 18.

Consequently, to permit swinging movement of the arm 11 to the closed position, the junction between the surfaces 18 and 19 was rounded, and there was a significant gap between the surfaces 16 and 18 when in the closed position. As previously mentioned, it was necessary to form the arm 11, along the edges of the surface 18, with flanges to extend across and cover this gap.

In the arrangement shown in the drawing, on the other hand, the surfaces 16 and 18 lie wholly to one side of the plane 24, and the junction between the surfaces 15 and 17 lies on the plane 24 so that the surfaces 16 and 18 come into overlying relationship at the same time as the surface 19 abuts the surface 17. No rounding of the junction between the surfaces is therefore necessary, and there is no need for a significant clearance between the surfaces 16 and 18 in the closed position. In practice this clearance may be less than five thousandth of an inch. It is therefore not necessary to provide any protecting flanges on the arm 11 to extend across the gap between the surfaces 16 and 18 to prevent insertion of a lever.

The described construction considerably simplifies the manufacture of the locking device, and makes it cheaper to produce than known devices of this type. The arms 10 and 11 may be flame cut initially with an allowance made for final machining to form the recesses 13 and 14 and the surfaces 15, 16, 17 and 18 to the required accuracy.

It will be appreciated that the junction between the surfaces 16 and 17 of the rebate does not necessarily have to lie exactly on the plane 24 but could be anywhere to the righthand side of that plane. Also it is not essential for the surfaces 17 and 19 to lie in the plane 24 as shown. They could be parallel to that plane to the righthand side thereof, or could be inclined at an angle to the plane. In this case the surfaces 17 and 19 could extend across the plane 24 and wholly or partly to the lefthand side thereof, provided that the surfaces 16 and 18 are disposed wholly to the righthand side of the plane.

CLAIMS

1. A locking device, for attachment to the king pin of an articulated tractor-trailer connection, comprising two cooperating arms pivotally connected together and shaped to define between them an aperture which, in an open position of the arms, is open at one side to receive the king pin and, in a closed position of the arms, embraces the king pin, the ends of the arms remote from the pivotal connection being formed respectively with first surfaces, extending transversely of the pivot axis, which are brought into overlying relationship with one another in the closed position, and second surfaces, inclined at an angle to the first surfaces respectively, which are brought into abutting relationship in the closed position, and key operated locking means mounted on one arm and having a movable detent which may be projected across said overlying first surfaces, when in the closed position, to prevent relative movement therebetween from the closed position, each first surface lying wholly to one side of a plane passing through the pivot axis of the device and extending at right angles to the first surface.

2. A locking device according to claim 1, wherein the junction between each first surface and its associated second surface lies in said plane passing through the pivot axis of the device and extending at right angles to the first surface.

3. A locking device according to claim 2, wherein the second surfaces extend at right angles to the first surfaces respectively and lie in said plane passing through the pivot axis of the device.

4. A locking device according to any of claims 1 to 3, wherein the aperture defined between the cooperating arms is circular.

5. A locking device according to claim 4, wherein the centre of the circular aperture lies in said plane passing through the axis of the device.

6. A locking device substantially as hereinbefore described with reference to the accompanying drawing.

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