

(21) Application No 8509478

(22) Date of filing 12 Apr 1985

(30) Priority data

(31) 8410938 (32) 28 Apr 1984 (33) GB

(71) Applicant
Crane Engineering Limited (United Kingdom),
Pytchley Road Industrial Estate, Kettering,
Northamptonshire NN15 6JG

(72) Inventor
Peter England

(74) Agent and/or Address for Service
C. P. Healy,
134 Grayswood Avenue, Coventry CV5 8HQ

(51) INT CL⁴
B62D 53/06

(52) Domestic classification
B7T D3B2 D3B3
B8E 38

(56) Documents cited
US 4472100

(58) Field of search
B7T
B8E

(54) Detachable gooseneck of trailer

(57) The detachable gooseneck (13) of a trailer is pivoted to two laterally spaced towers (14) about forwardly mounted pivot points (21) and can be moved up and down by two rearwardly attached upright rams (23). The pivotal connections of the gooseneck and of the ram (21) and (22) are each generally symmetrical and lie on a common longitudinal plane through the trailer. Each pivot (21), (22) is symmetrically loaded and torsional and lateral loads of damage or seizing in use under heavy load or on rough terrain. The towers (14) are detachably secured to the trailer platform (11) by projections (41) engaging apertures (42), and by an air operated locking pin. When the gooseneck has been removed from the trailer platform, it can be tilted relative to the tractor by a power cylinder within the gooseneck acting on a member engageable with the tractor.

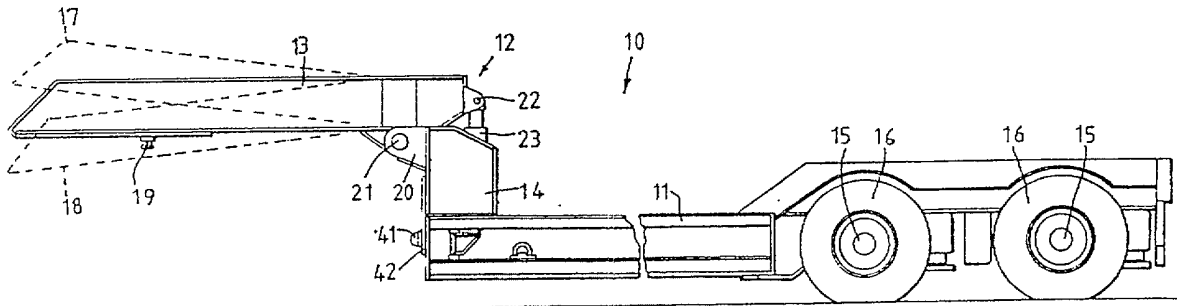


FIG. 1

2158025

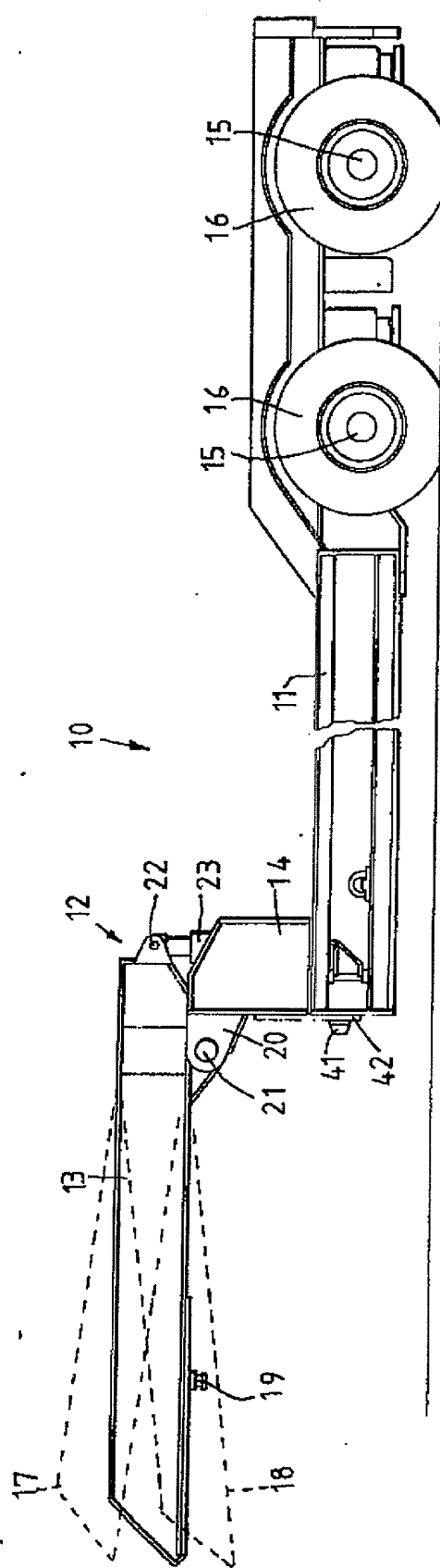


FIG. 1

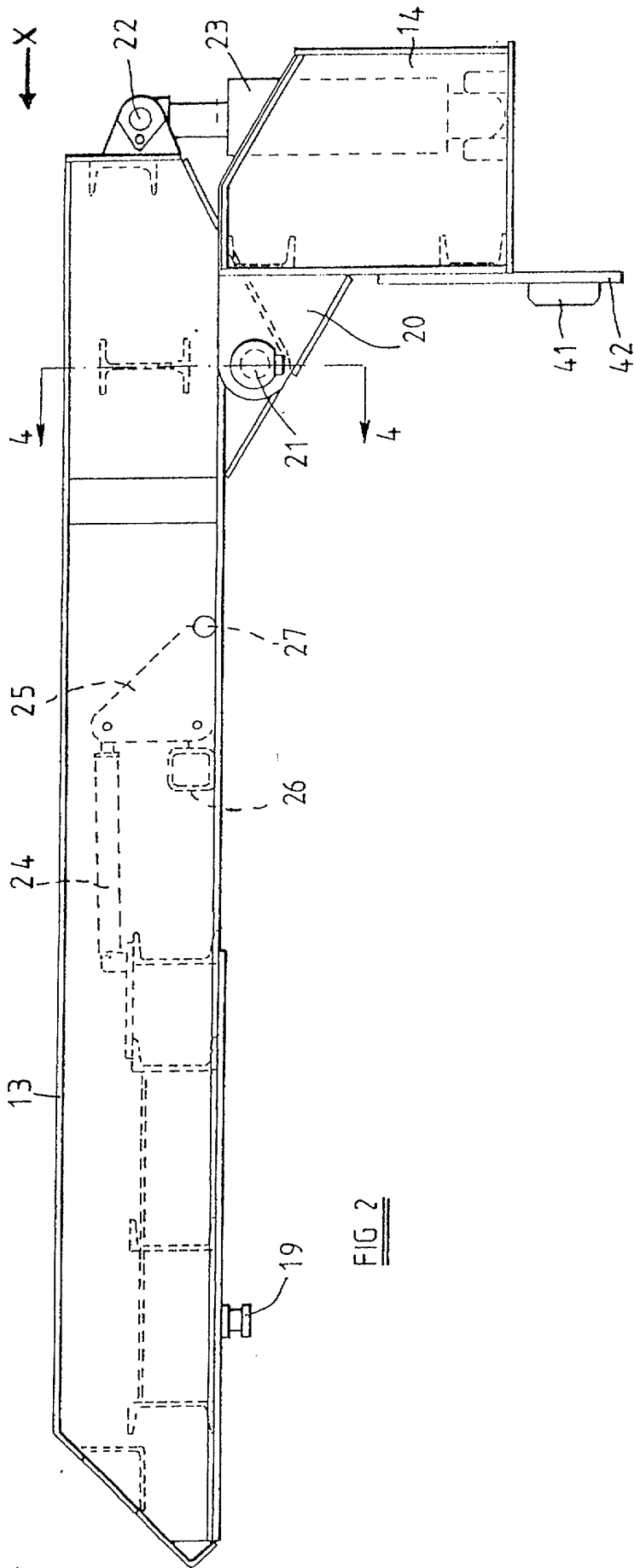


FIG 2

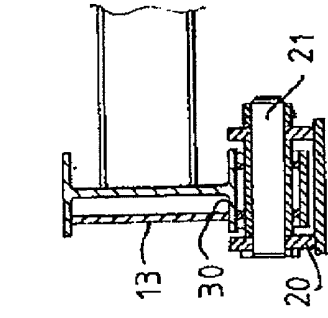


FIG 4

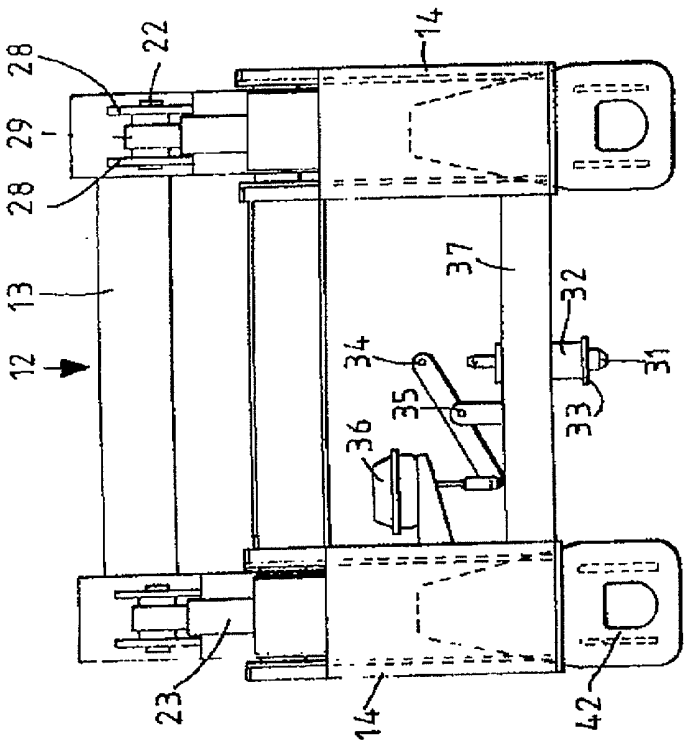
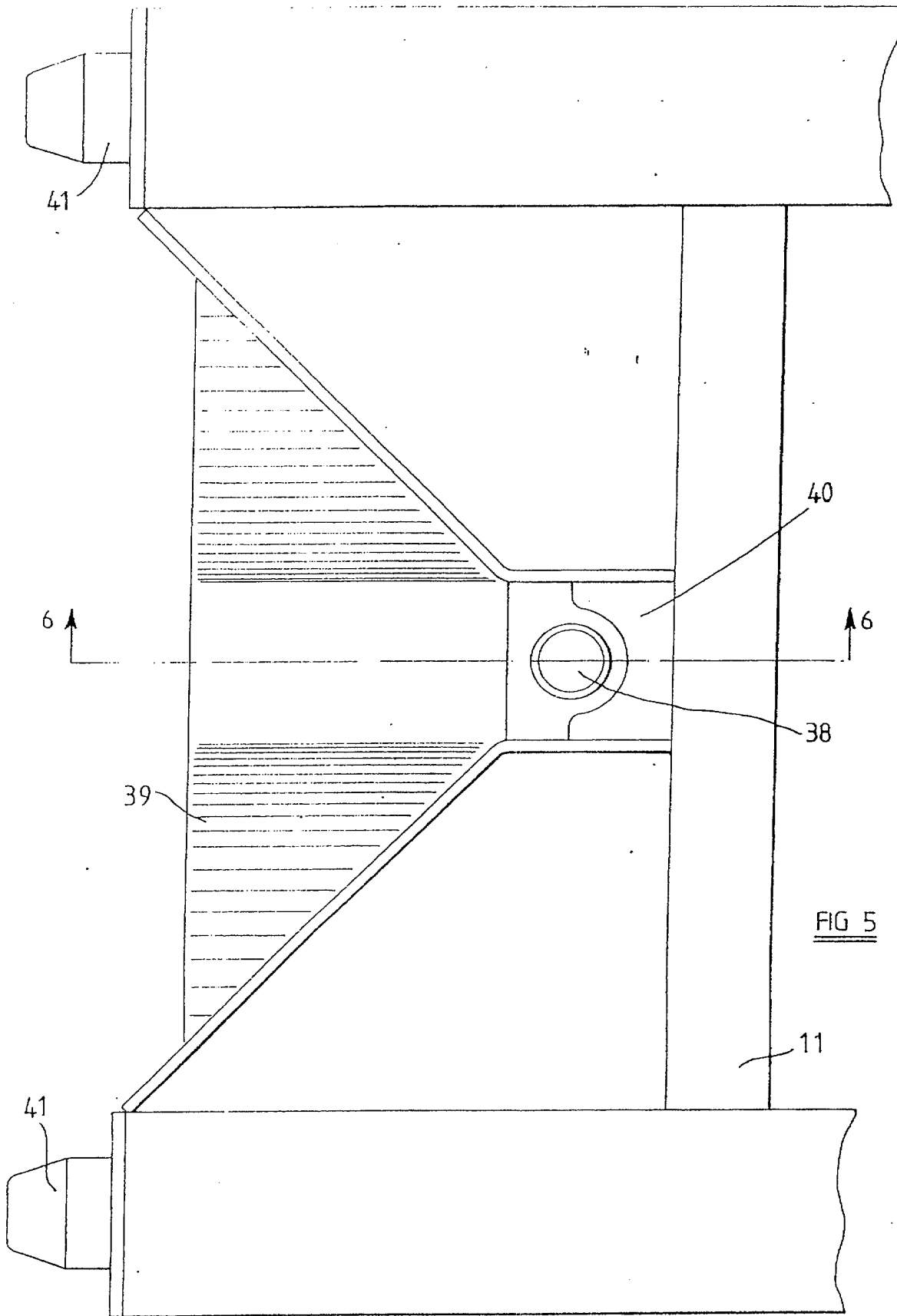


FIG 3



10

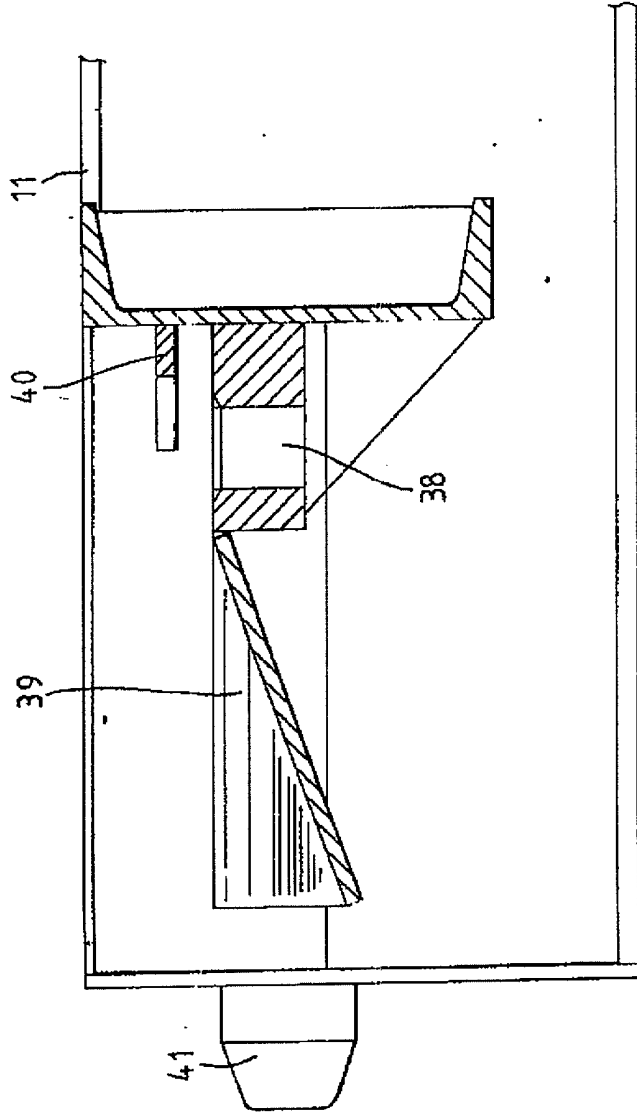


FIG 6

SPECIFICATION

Trailer

5 This invention relates to a trailer for towing behind a tractor vehicle and specifically relates to the type of trailer having a detachable gooseneck.

It is known to provide a trailer with a detachable gooseneck which, while the trailer is being used for transporting a load, connects the load carrying platform of the trailer to the "fifth wheel" of a tractor unit. When it is desired to unload the trailer, the gooseneck assembly is released from its connection with the trailer platform and towed away on the tractor vehicle, leaving the trailer behind.

Previous proposals for detachable goosenecks have been prone to difficulties because of unbalanced forces acting on the components of the gooseneck and in particular on the pivotal mounts.

Over a period of time, under heavy load or on rough terrain, these unbalanced forces may give rise to distortions affecting the functioning of the gooseneck. In particular these distortions can cause the pivotal mounts to seize.

Objects of the present invention are to provide a new or improved trailer having a detachable gooseneck which is less prone to such difficulties, and to provide a detachable gooseneck of new or improved design.

According to the invention there is provided a trailer comprising a platform; a plurality of road wheels; and a detachable gooseneck; the gooseneck comprising a tower releasably secured to the trailer platform and having a pivot housing projecting forwardly therefrom and an associated power means, the gooseneck further comprising a neck member for attachment to a tractor unit to tow the trailer, and pivoted to the tower at said pivot housing and rearwardly of the pivot housing to the power means, whereby the neck member can be pivotably raised and lowered by operation of the power means, wherein the pivotal connections of the pivot housing and of the ram are each generally symmetrical and lie on a common longitudinal plane through the trailer.

In this way, each pivot pin is under two symmetrically disposed shear forces, the balanced loading reducing the risk of damage or seizing in use, especially under heavy load or on rough terrain. Similarly the forward and rearward pivots of the neck member lie on a common plane, reducing torsional or lateral loads which act on the neck member of a conventional detachable gooseneck.

The gooseneck may have a pair of towers and a pair of associated power means on laterally opposed sides of the trailer, with the respective pivots lying on a pair of parallel longitudinal planes.

The towers may be locked to the platform of the trailer by a pneumatic locking device which preferably serves simultaneously to lock both towers in position.

The power may comprise generally upright hydraulic rams.

The invention also provides a detachable gooseneck for fitment to a trailer comprising a tower re-

leasably secured to the trailer platform and having a pivot housing projecting forwardly therefrom and an associated power means, the gooseneck further comprising a neck member for attachment to a tractor unit to tow the trailer, and pivoted to the tower at said pivot housing and rearwardly of the pivot housing to the power means, whereby the neck member can be pivotally raised and lowered by operation of the power means, wherein the pivotal connections of the pivot housing and of the ram are each generally symmetrical and lie on a common longitudinal plane.

A trailer incorporating a detachable gooseneck embodying the invention will now be described in more detail by way of example only with reference to the accompanying drawings in which;

Figure 1 is a side elevation view of the trailer, partly broken away, with alternative positions of the gooseneck shown in dotted outline,

Figure 2 is a side elevational view of the gooseneck on a larger scale,

Figure 3 is a view in the direction of the arrow x of *Figure 2*,

Figure 4 is a section on the line 4-4 showing a pivotal mount,

Figure 5 is a plan view of the forward end of the trailer platform,

Figure 6 is a sectional view on the line 6-6 of *Figure 5*.

Referring firstly to *Figure 1* of the drawings, a trailer generally indicated at 10 comprises a platform 11 and a gooseneck assembly generally indicated at 12 and itself comprising a neck member 13 and a pair of towers 14, disposed at laterally opposed sides of the neck member 13. Since each tower assembly 14 is a mirror image of the other, only one will be described for simplicity in the following description.

The trailer platform 11 is provided with twin axles 15 carrying road wheels 16 towards its rear end. The forward end is supported entirely on the gooseneck 12 during normal running of the trailer. The position of the neck member 13 shown in *Figure 1* is the normal running position.

However, the neck member 13 can be lifted to the upper position shown in dotted outline at 17 or lowered to the position shown in dotted outline 18 by the operation of the mechanism to be described. The gooseneck 12 carries a conventional king pin 19 for connection to the "fifth wheel" of a tractor unit in generally known manner.

Referring to *Figure 2* of the drawings, each tower 14 has a forwardly projecting pivot housing 20 having a pivot 21, for mounting the neck member 13. At a position spaced rearwardly of the pivot 21, the neck member is also pivoted at 22 to the upper end of a vertically disposed hydraulic ram 23, mounted in the tower 14. The neck member 13 forms a lever pivoted about the fixed pivot point 21 so as to be rocked upwardly or downwardly by the ram 23 between the dotted line positions 17 and 18.

Within the neck member 13, a further small piston and cylinder assembly 24 is provided, acting on a triangular plate 25 which is braced to a trans-

verse member 26 forming part of the structure of the neck member 13. At the third corner of the triangular plate 25 a transverse bar is provided. This assembly is brought into operation for removal of the gooseneck from the trailer platform as will be described below.

Figure 3 is a forwardly facing view on the arrow x of Figure 2 and shows the towers 14 with their associated upright rams 23. The neck member 13 is supported by the towers and the pivots 22 which connect the rear end of the neck member to the rams can be seen clearly in this Figure.

It will be noted that the pivot arrangements 22 are laterally symmetrical. Each comprises a pair of side plates 28 forming rearward extensions of the neck member 13 and a central collar 29 on the piston rod of the ram 23. It will be appreciated that, when the ram exerts a force via the collar 29 on the pivot pin 22, the reaction forces generated by the plates 28 are symmetrically disposed with respect to the pin and hence the risk of distortion under repeated use is reduced.

It will also be seen that the ram 23 is disposed centrally within the tower 14. Similarly, the pivot housing 21, part of which is shown in section in Figure 4, is also in line with the pivot 22 and the ram 23, all of these lying on a generally longitudinal common plane. The tower assembly at the other side of the trailer also lies on a similar longitudinal plane, parallel to the first. Thus, the towing forces exerted on the trailer in use are transmitted linearly without substantial lateral or torsional components of force acting on the parts of the assembly. Again, this reduces the risk of pivots seizing or of damage or distortion to the pivots or elements of the neck even under heavy load or when passing over rough terrain.

Referring again to Figure 4 of the drawings, it will be seen that the pivot mount 21 of the pivot housing 20 is again symmetrical with the side walls of the pivot housing 20 tending to load the pivot pin in one sense and a collar 30 of the neck member 13 exerting a reaction load on the central portion of the pin 21.

Referring to Figure 3 of the drawings, it will be seen that the gooseneck 12 is secured to the platform 11 by means of an air locking pin 31, surrounded by a collar 32 having a bearing flange 33. The pin moves upwardly and downwardly in a vertical sense to unlock and lock the gooseneck assembly 12 to the platform (not shown in Figure 3).

A lever 34 is pivoted to a fulcrum member 35 mounted on a cross beam 36 between the towers 14. The lever 34 is operated by a pneumatic source 36 having a return spring arrangement (not shown). Because the air locking mechanism is positive in operation, there is a reduced tendency for it to become clogged by road dirt and debris, compared with conventional manual locking arrangements.

Figures 5 and 6 show the forward end of the trailer platform 11, which engages with the locking pin assembly to attach the gooseneck to and detach it from the platform.

The pin 31 is inserted downwardly into a hole 38

which is surrounded by a tapered location plate 39 enabling the tractor unit to be backed into the correct position for engaging the pin 38. The bearing flange 33 on the pin locates beneath a projecting plate 40 to prevent accidental upward detachment.

In order to locate the tower members 14 correctly on the forward end of the platform 11, a pair of projections 41 are provided which are inserted into apertured "tear drop" plates 42 on the tower assemblies. These plates take the thrust load of the trailer.

In use, the tower assemblies are secured by the air locking means to the forward end of the platform 11 as shown in Figure 1. There is no locking device for locking the neck member in the horizontal condition shown, since the rams 23 are provided with suitable valve means to hold the neck member in position.

To remove the tractor unit, the rams 23 are firstly operated to cause them to contract and thereby raise the forward end of the neck member to the upper dotted line position 17. The forward end of the platform 11 is therefore lowered to the ground to become self supporting.

The subsidiary cylinder arrangement 24 is operated to bring the bar 27 into abutment with a portion of the chassis of the tractor unit, so that the weight of the gooseneck is supported by the chassis. The gooseneck assembly 12 is then unlocked from the forward end of the platform and the tractor can be driven away.

The tractor can be re-coupled by reversing the sequence of operations with the locking pin being guided into place by the inclined guide plate 39.

The dotted line position 18 of the neck member 13 is used to raise the forward end of the platform for running over rough ground.

CLAIMS

1. A trailer comprising a platform; plurality of road wheels; and a detachable gooseneck; the gooseneck comprising a tower releasably secured to the trailer platform and having a pivot housing projecting forwardly therefrom and an associated power means, the gooseneck further comprising a neck member for attachment to a tractor unit to tow the trailer, and pivoted to the tower at said pivot housing and rearwardly of the pivot housing to the power means, whereby the neck member can be pivotally raised and lowered by operation of the power means, wherein the pivotal connections of the pivot housing and of the ram are each generally symmetrical and lie on a common longitudinal plane through the trailer.

2. A trailer according to Claim 1 wherein the gooseneck has a pair of towers and a pair of associated power means on laterally opposed sides of the trailer, with the respective pivots lying on a pair of parallel longitudinal planes.

3. A trailer according to Claim 1 or Claim 2 wherein the or each tower is locked to the platform of the trailer by a pneumatic locking device.

4. A trailer according to Claim 2 or Claim 3 wherein both towers are simultaneously locked in

position by a single pneumatic locking device.

5. A trailer according to any preceding claim wherein the power means comprise generally upright hydraulic rams.

5 6. A detachable gooseneck for fitment to a trailer, the gooseneck comprising a tower releasably secured to the trailer platform and having a pivot housing projecting forwardly therefrom and an associated power means, the gooseneck further
10 comprising a neck member for attachment to a tractor unit to tow the trailer, and pivoted to the tower at said housing and, rearwardly of the pivot housing to the power means, whereby the neck member can be pivotally raised and lowered by
15 operation of the power means, wherein the pivotal connections of the pivot housing and of the ram are each generally symmetrical and lie on common longitudinal plane through the trailer.

7. A trailer substantially as hereinbefore described with reference to and as illustrated in the
20 accompanying drawings.

8. A detachable gooseneck for fitment to a trailer, the gooseneck being substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.
25