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(71) Applicant: **Bushey Hall Winches & Equipment Ltd.**
Elstree, Borehamwood,
Hertfordshire, WD6 3EE (GB)

(72) Inventor: **Ayres, Eric Edward**
Rickmansworth, Hertfordshire, WD3 4BQ (GB)

(74) Representative: **Kensett, John Hinton**
Saunders & Dolleymore,
9 Rickmansworth Road
Watford, Hertfordshire WD1 7HE (GB)

(54) Winch apparatus

(57) Winching apparatus provided on a vehicle, comprising a winch (10), a winch cable (18) and a cable path comprising a first pulley (14) mounted about a fixed pivot and a second pulley (15), the winch cable being passed partially around the first pulley and the second pulley, so that the return angle of the cable to the winch remains constant regardless of the varying angle of the cable past the second pulley as a vehicle is winched in. The second pulley may be mounted to be movable sideways, to accommodate vehicles whose damage tends to cause them to move sideways during winching.

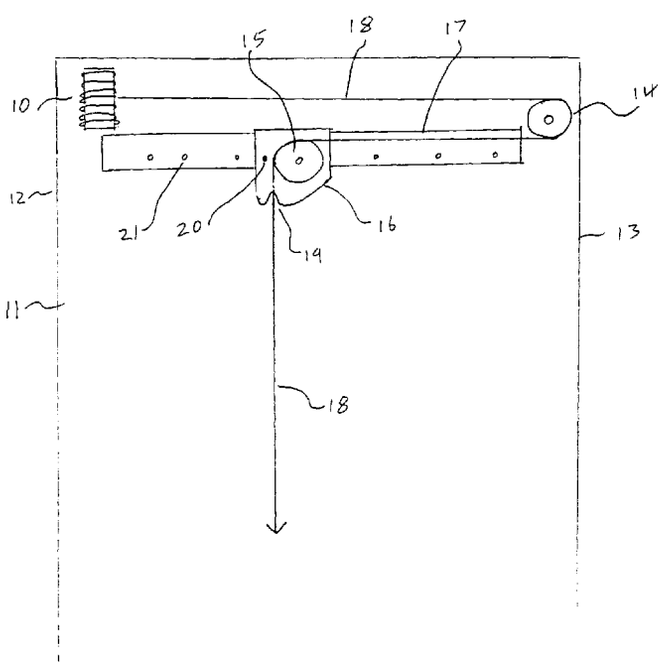


FIG 2

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Description

This invention relates to winch apparatus. Particularly, but not exclusively, it relates to winch apparatus for use on a recovery vehicle.

Recovery vehicles are used to recover broken down or accident damaged vehicles from the site of an incident. They generally comprise a winching means which is used to pull a vehicle onto a bed of the recovery vehicle for subsequent transportation.

Figure 1 shows a typical conventional winching layout on a recovery truck. A winch 1 is mounted upon a bed 2 of a recovery truck such that its axis of rotation lies parallel to the axles of the truck. A winch cable 3 is wound around the winch and extends to the back of the bed where it may be used to attach to a vehicle 4 to be recovered. Motor vehicles generally have one or more towing eyes 5 to which the winch cable 3 is attached.

In most modern cars the towing eye tends to be offset from the central longitudinal axis of the car. This is shown in Figure 1 where eye 5 is mounted towards the left hand side of the car. Towing ropes or cable 3 is attached to eye 5 and the winch is then operated by a motor to pull the car in. As the car is pulled in, cable 3 wraps around winch 1. However, as the car is pulled in, since eye 5 is off-set from its centre, the angle of the winching cable 3 increases. This is illustrated by dashed lines 4a, which shows the resting position of the front of the car, and 3a which shows a final position and angle of winch cable 3. The effect of the large variation in angle A (known as the fleet angle) is often that the cable tends to unevenly wind around the winch 1 and may bunch towards one or other edges of the winch roller or tend to snag. Desirably, a cable is evenly wound upon a winch and this leads to the most efficient winding in and out and also minimises wear on the cables.

The present invention arose in an attempt to provide an improved winching mechanism.

According to the present invention there is provided winching apparatus provided on a vehicle, comprising a winch, a winch cable and a cable path comprising a first pulley mounted about a fixed pivot and a second pulley, the winch cable being passed partially around the first pulley and the second pulley.

Preferably, the winch is horizontally mounted such that its axis of rotation lies generally perpendicular to the axles of the vehicle.

Preferably, the winch is mounted towards one side of the vehicle, the first pulley is mounted towards the other side and the second pulley is disposed generally between the two, such that the cable path returns through approximately 180° around the first pulley.

The second pulley may form part of a fairlead which is moveable sideways to selected positions.

Desirably, the second pulley is movable between a plurality of a laterally disposed positions across the vehicle, so that its position can be selected for maximum benefit in any situation.

Winch apparatus according to the invention may be used for loading or unloading any heavy, bulky or large objections into and/or out of vehicles and is not restricted to use with recovery vehicles.

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows a typical known winching system; and

Figure 2 shows an embodiment of a winching system according to the present invention.

Referring to Figure 2, a winching system for use on a recovery vehicle comprises a winch 10 mounted upon the bed 11 of a recovery vehicle. The winch is driven by a motor (not shown) and may be controlled through an operating panel mounted on the recovery vehicle, or by a remote wander lead or by other means. The winch 10 is preferably mounted such that its rotation axis lies generally perpendicular to the axles of the vehicle. That is, it is angularly displaced by 90° compared to the prior art winch shown in Figure 1. This angle may vary, however. The winch is mounted as close as possible to one side 12 of the bed. Located close to the other side 13 of the bed is a fixed pulley 14. This is mounted so that the distance between it and the winch is as large as possible. A further pulley 15 is mounted upon a body 16 which is in turn slidable or otherwise moveable, upon a slide member 17 which is disposed generally parallel to the axles of the vehicle.

A winch cable 18 is partially wound upon the winch 10 then across the bed and around pulley 14. After pulley 14, the cable returns to be passed around pulley 15 and through an opening 19 in member 16 (the fair lead). From here, the winch cable may be pulled out to the rear of the recovery bed for attaching to the vehicle to be recovered.

In operation, the cable is pulled in and out from the winch as before but its fleet angle (that is the return angle at the winch 10) is constant since from the winch the cable is constrained to a fixed path between the winch and fixed pulley 14. The change in angle of the winch cable caused as a vehicle is pulled onto the bed is all taken up at fair lead 16 and pulley 15. After pulley 15, the cable travels on a constant path between pulley 15 and fixed pulley 14 and then to the winch. This leads to a much improved and more stable winding of the cable onto the winch. The winding becomes much more even and snagging and wear on the cable are substantially reduced. Pulley 14 is of course free to rotate about its axis.

Badly damaged vehicles, particularly those with damaged suspensions, often have a tendency of crabbing, that is, pulling to one side as they are being winched onto a recovery vehicle. In order to accommodate this effect, it is preferable that the position of fairlead 16 be moveable sideways. This is achieved in the

embodiment shown in Figure 2 by arranging for member 16, which bears the pulley 15, to be moveable sideways on a slide 17. In one embodiment, the member 16 may be fixed at any of a plurality of positions with respect to member 17, by means of a pin 20 which is inserted through member 16 and into one of a plurality of holes 21 in member 17. Other ways of securing the member 16 onto the slide 17 may be used. The position of the fairlead may be infinitely adjustable, for example by using a clamping mechanism. The slide may in some embodiments be omitted and fairlead 16 mounted directly in a chosen one of a plurality of locations on the vehicle bed. The fairlead can then be positioned appropriately to winch in the damaged vehicle most effectively.

The winch 10 may be provided with a freespool clutch mechanism, enabling the rope to be pulled off the drum quickly by an operator when required, instead of requiring it to be 'powered' off the drum.

The winch mechanism may be used for other purposes than vehicle recovery, such as for manipulating bulky objects into or out of vehicles. The mechanism may then be mounted on other parts of a vehicle. For example, it may be mounted on the upper part of the rear (eg above the rear door) of a van or truck, to assist in manipulating bulky objects into or out of the van or truck.

Claims

1. Winching apparatus provided on a vehicle, comprising a winch, a winch cable and a cable path comprising a first pulley mounted about a fixed pivot and a second pulley, the winch cable being passed partially around the first pulley and the second pulley.

2. Winching apparatus as claimed in Claim 1, wherein the winch is horizontally mounted such that its axis of rotation lies generally perpendicular to the axles of the vehicle.

3. Winching apparatus as claimed in Claim 1 or Claim 2, wherein the winch is mounted towards one side of the vehicle, the first pulley is mounted towards the other side and the second pulley is disposed generally between the two, such that the cable path returns through approximately 180° around the first pulley.

4. Winching apparatus as claimed in Claim 3, wherein the second pulley is laterally movable with respect to the vehicle.

5. Winching apparatus as claimed in Claim 43, wherein the second pulley is movable between a plurality of laterally disposed positions across the vehicle.

6. Winching apparatus as claimed in any of the preceding claims, which is mounted upon the bed of a recovery vehicle.

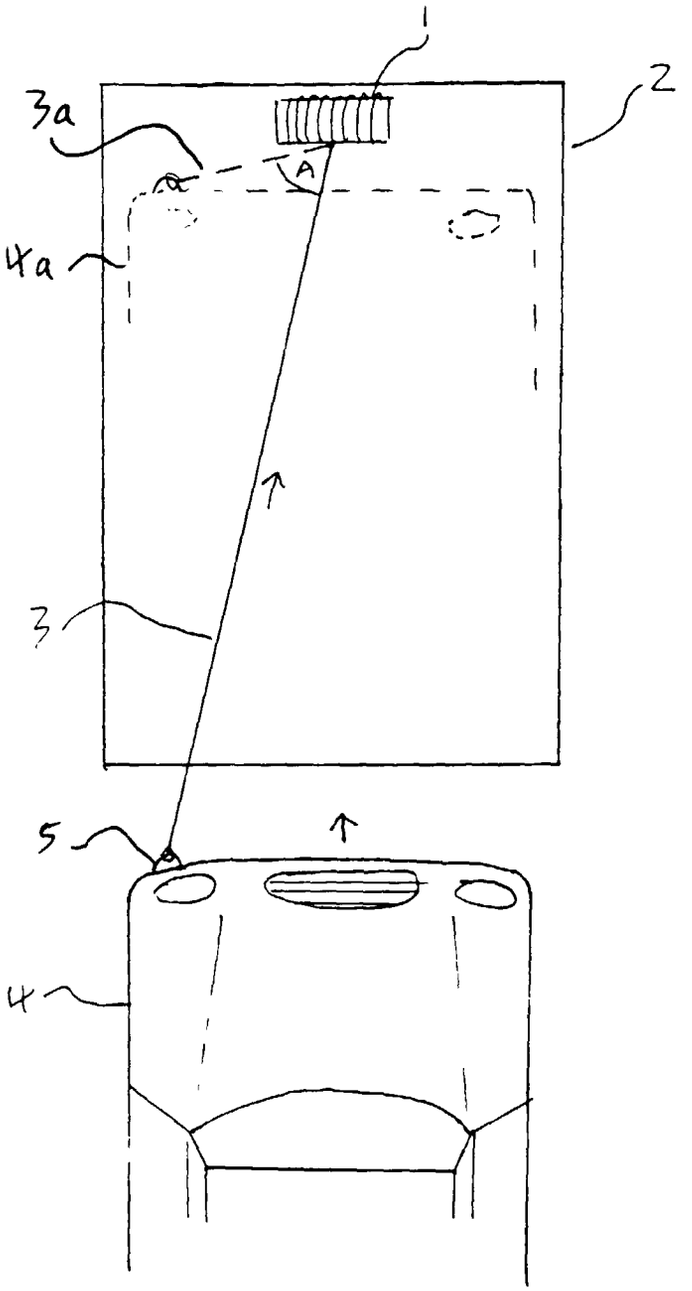


FIG 1

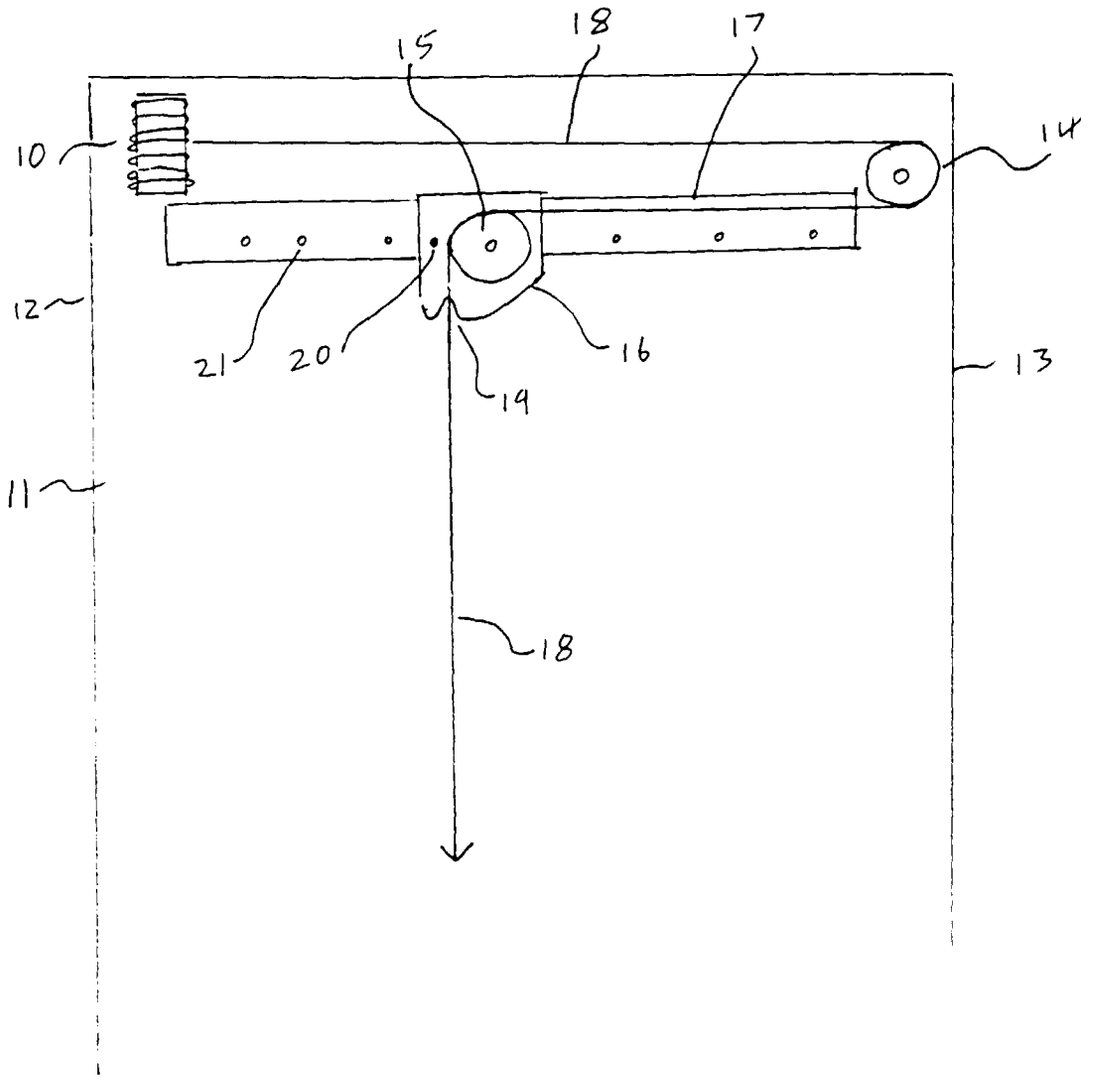


FIG 2