

(12) UK Patent Application (19) GB (11) 2 425 997 (13) A

(43) Date of A Publication 15.11.2006

(21) Application No: 0508283.9

(22) Date of Filing: 22.04.2005

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(51) INT CL:
B60R 9/10 (2006.01)

(52) UK CL (Edition X):
B7J J64

(56) Documents Cited:
WO 2002/024481 A1 **US 6722380 B1**
US 6199735 B1 **US 6129371 A**
US 5730345 A **US 5685469 A**
US 5658119 A **US 5518159 A**
US 5330084 A

(58) Field of Search:
UK CL (Edition X) **B7J**
INT CL⁷ **B60R**
Other: **WPI, EPODOC**

(54) Abstract Title: **Bicycle rack for a vehicle**

(57) A bicycle rack comprises cycle carrying supports 5 mounted to a head 1 that is pivotally coupled to an upright support member 20. The upright support member 20 is pivotally connected to a base 18,19 attached to a tow bar of the vehicle. The base 18,19 includes a manually operated locking mechanism 11,12,14,17 which enables the upright support member 20 to be locked in one of several pivoted positions, including a lowered position in which the support member is substantially horizontal and a raised position in which the support is substantially vertical. A self levelling rod 2 connects the head 1 and the base 18,19 to keep the head 1 and cycle carrying supports 5 level as the upright support member pivots. The base 18,19 is able to swivel through 180 degrees when a locking pin 24 is removed. The cycle rack allows access to a rear boot space of the vehicle even when cycles are mounted on the rack.

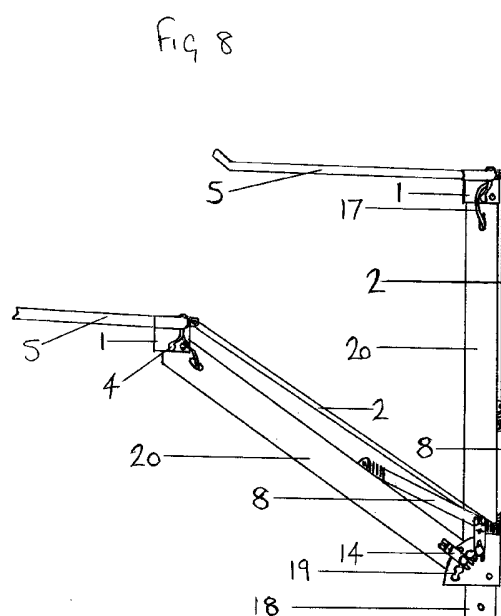
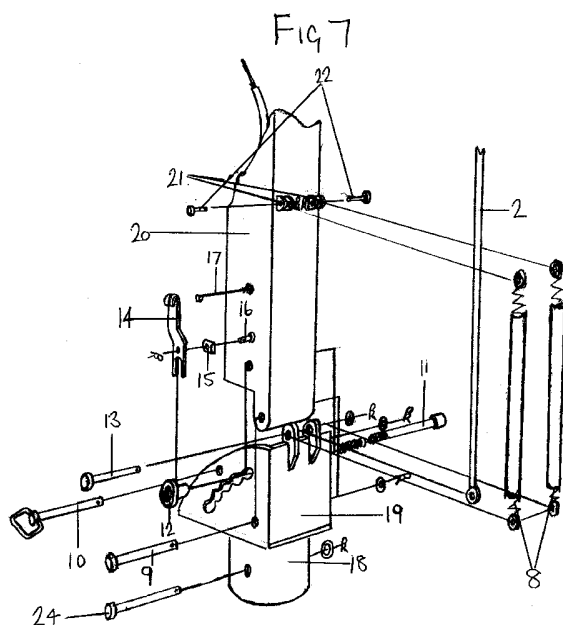
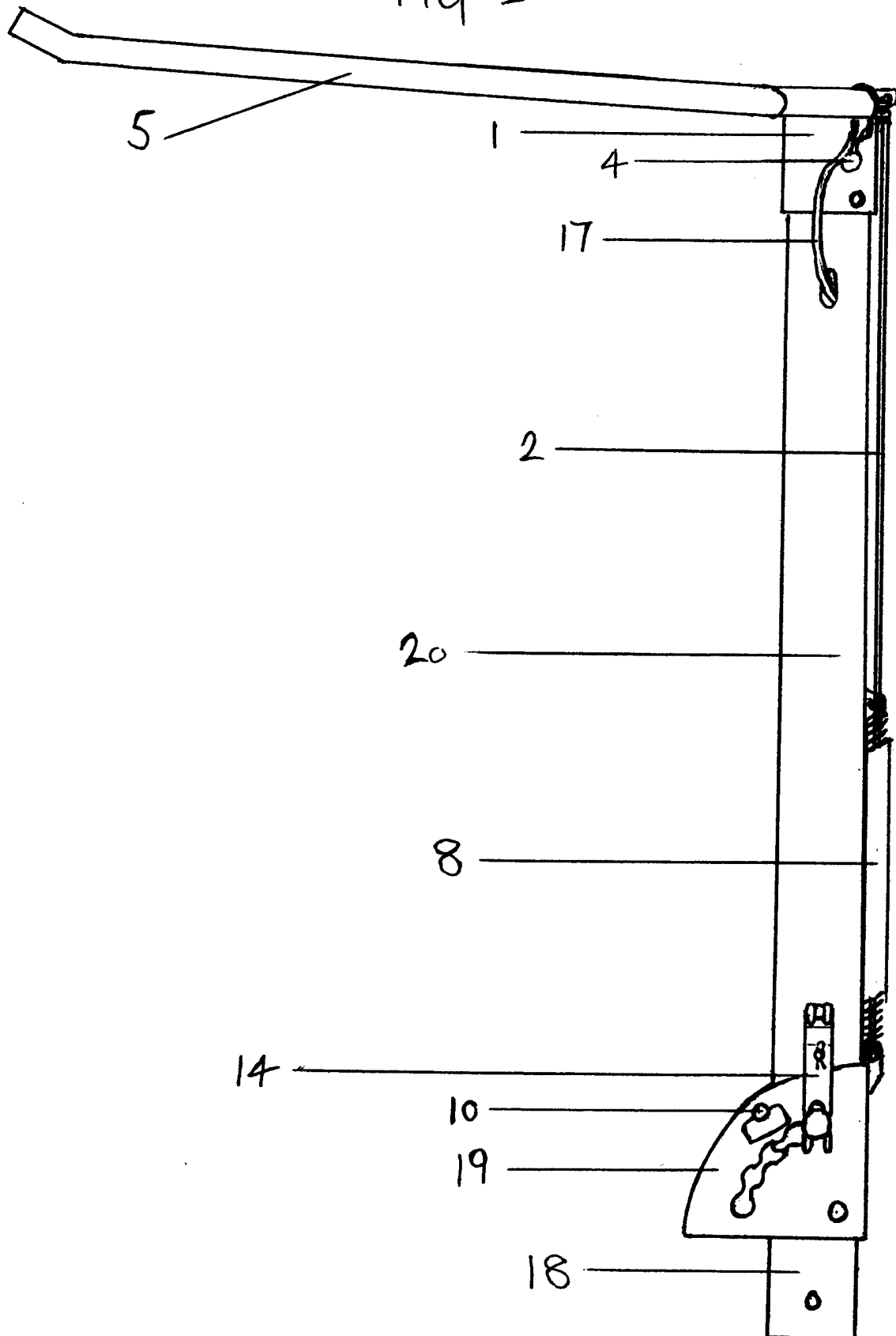
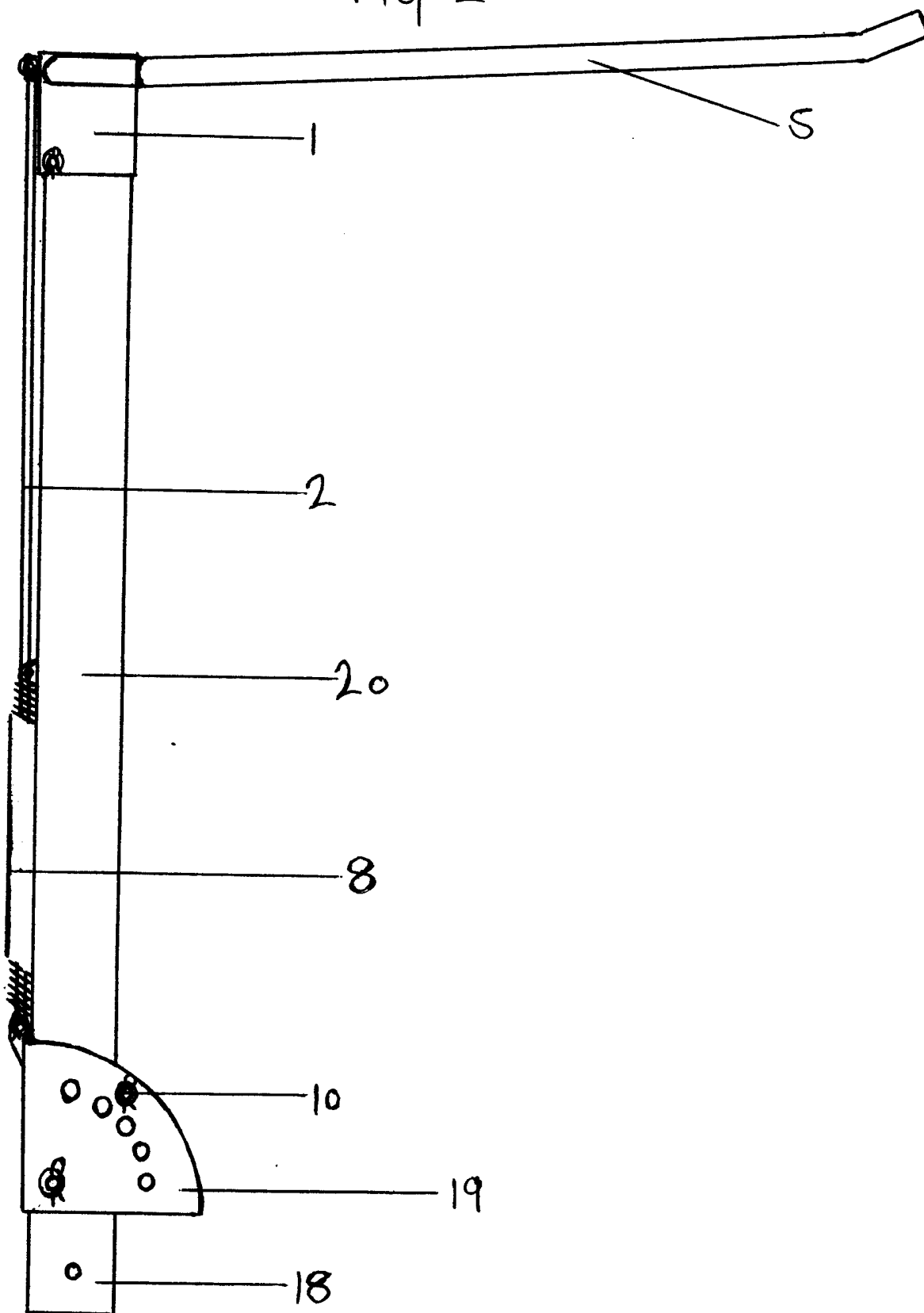


Fig 1

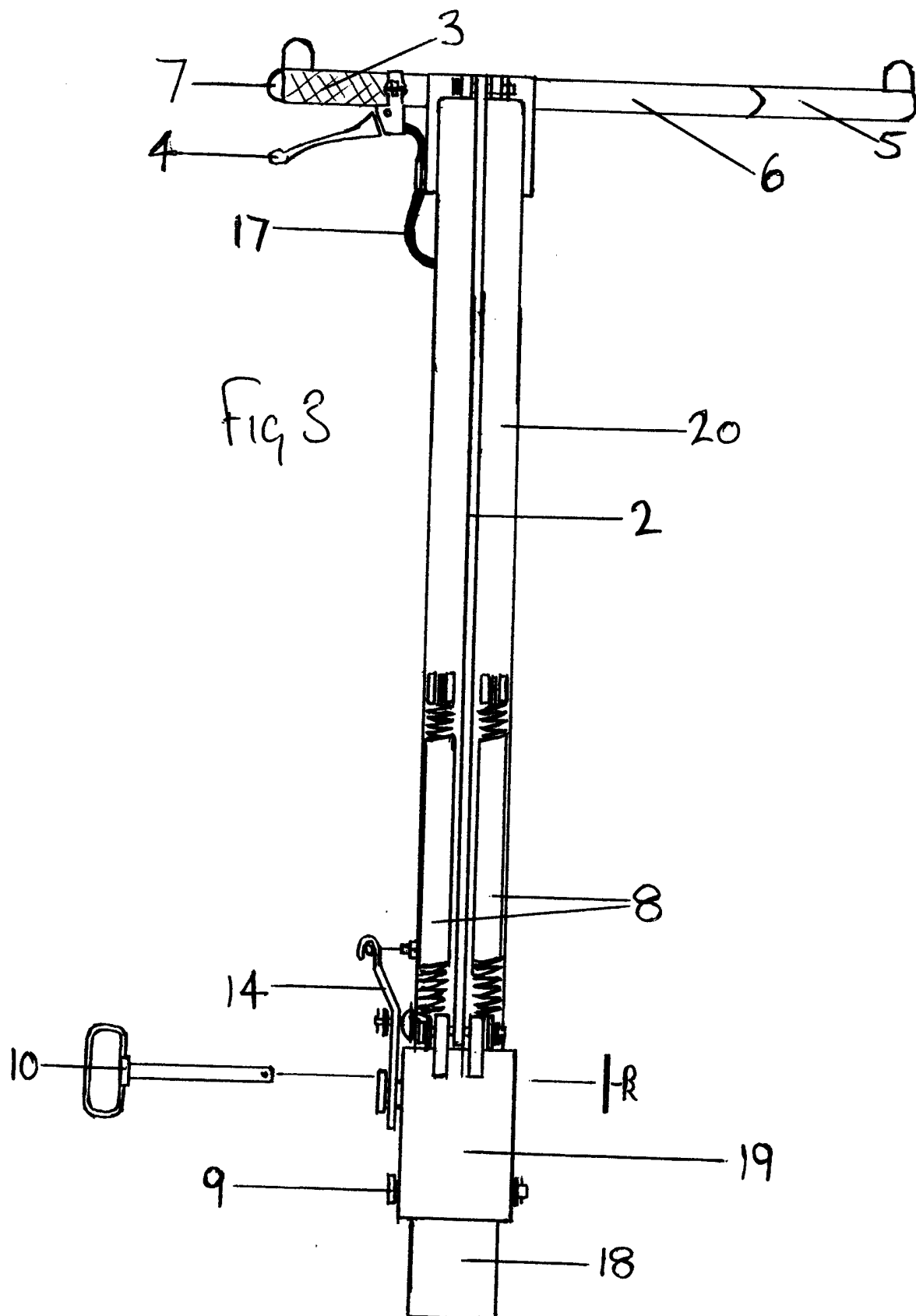


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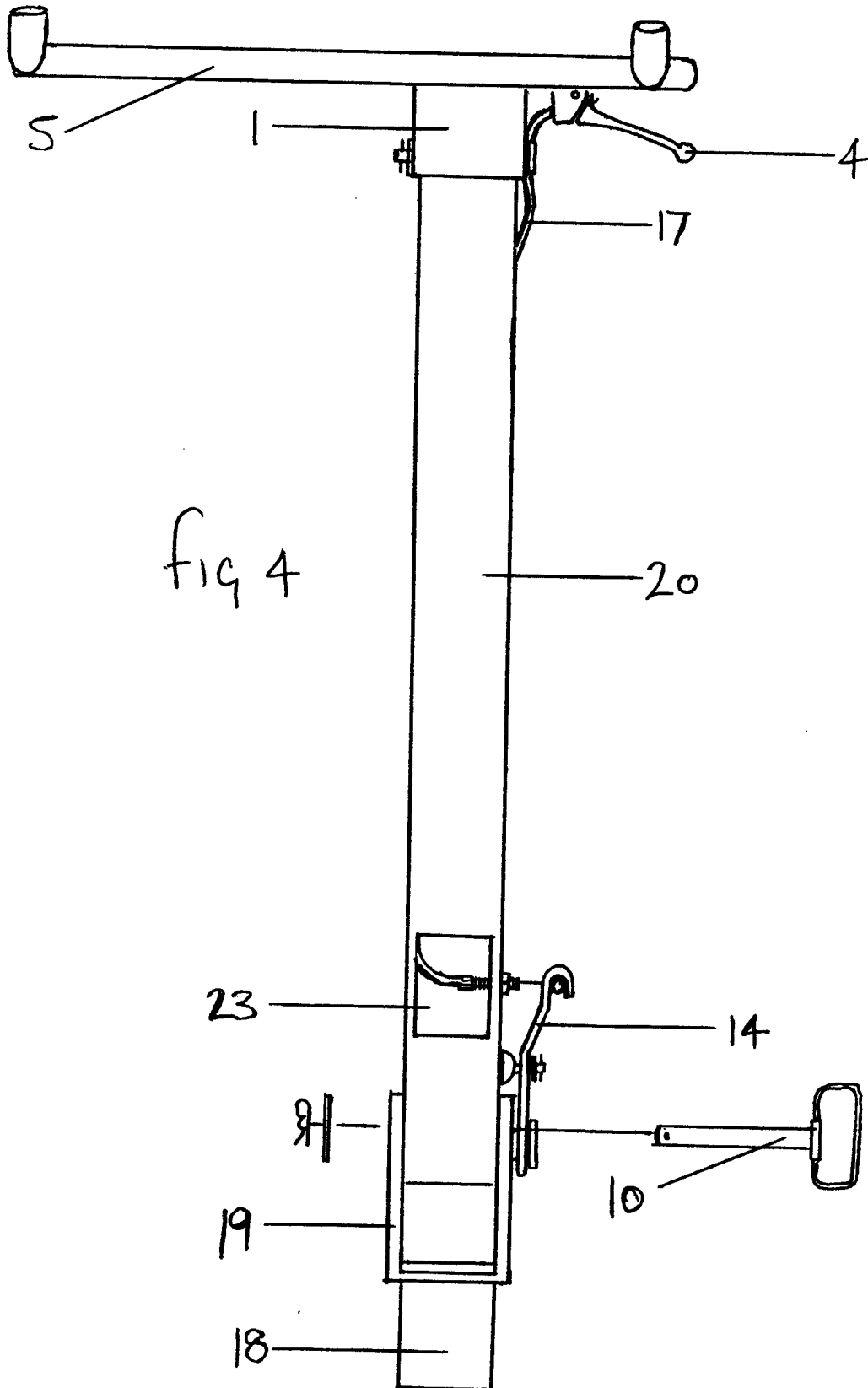
fig 2



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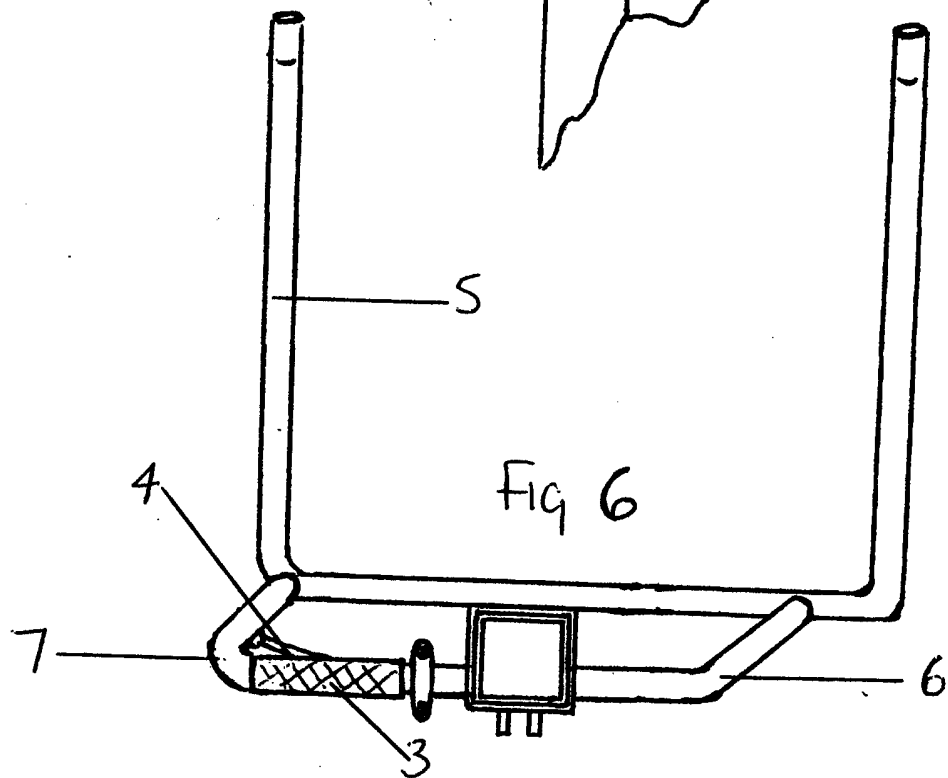
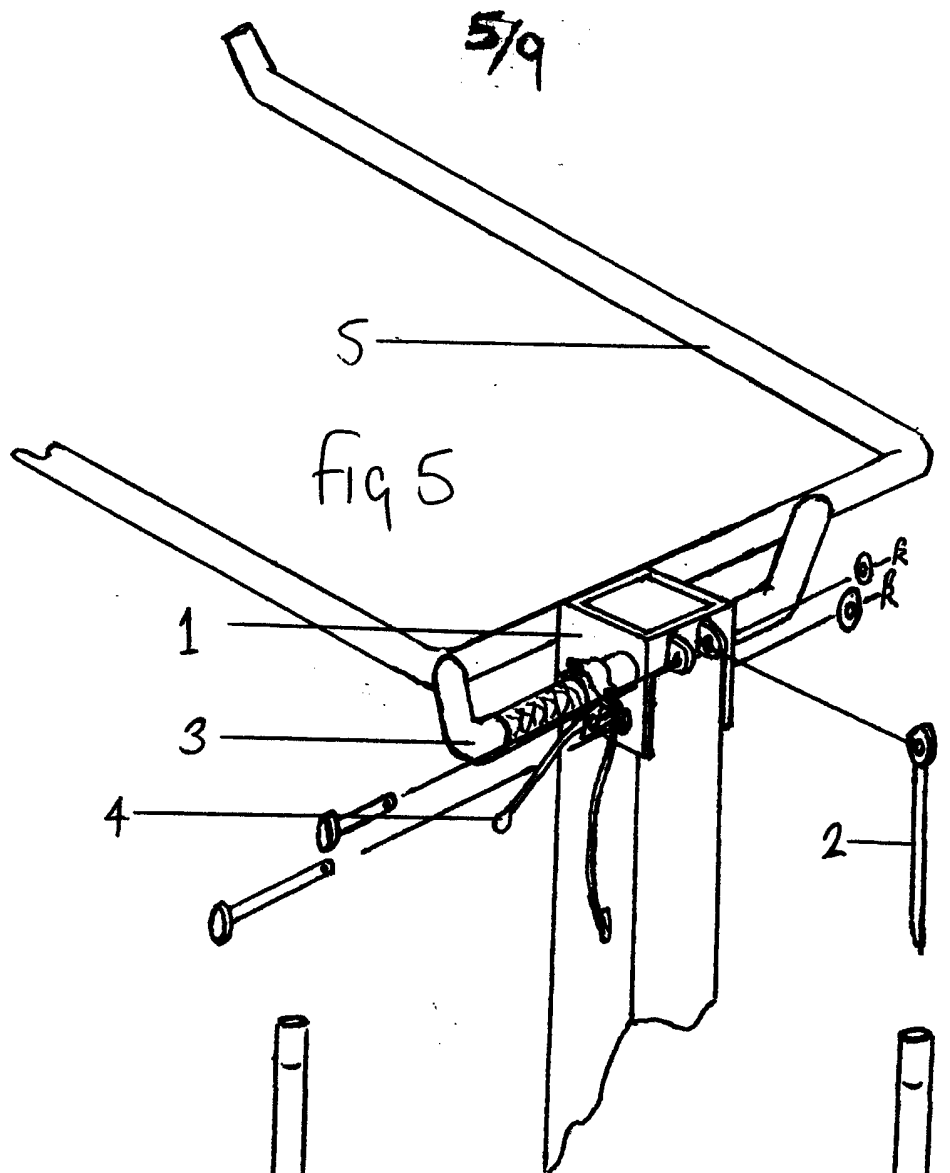
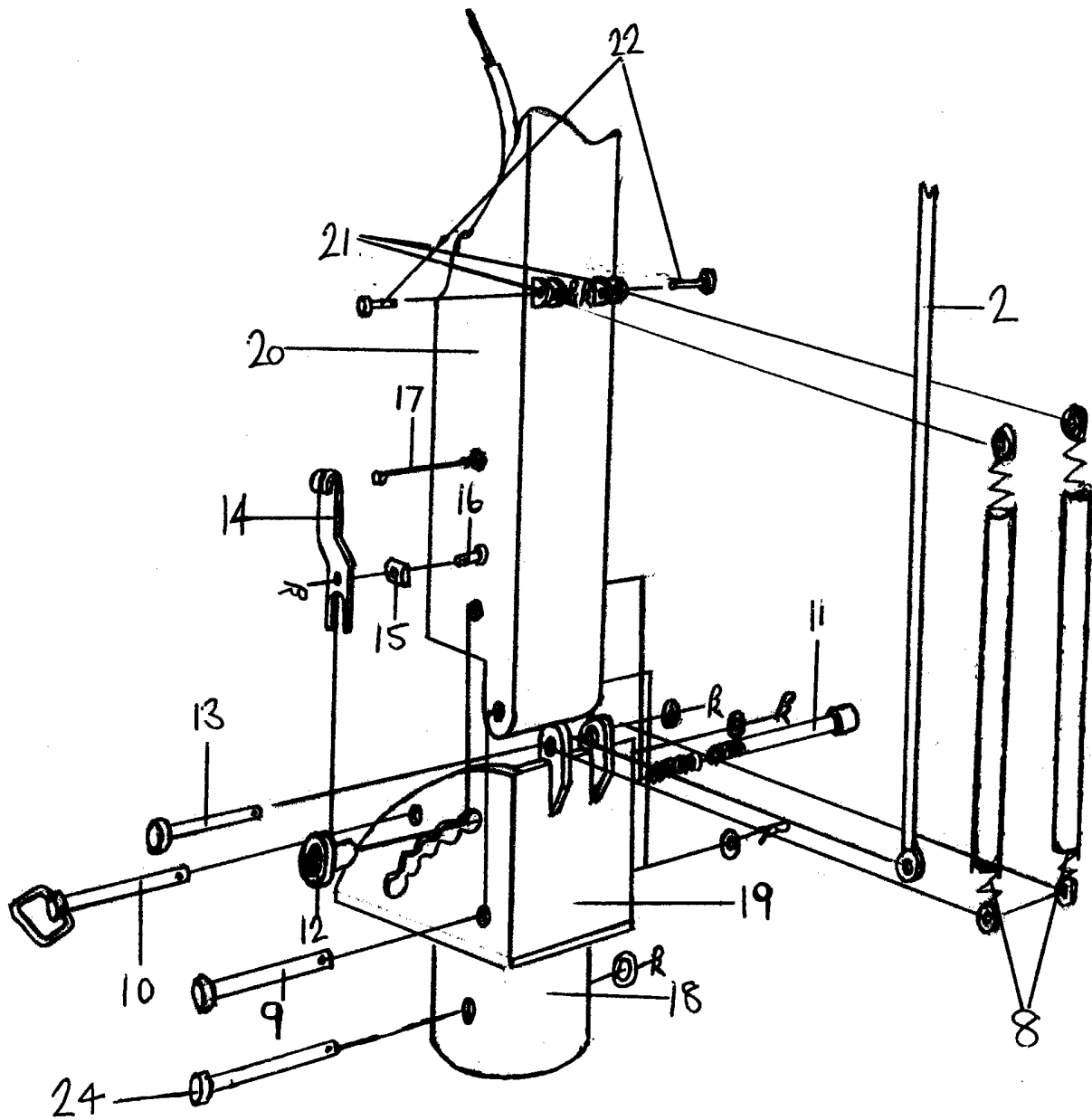
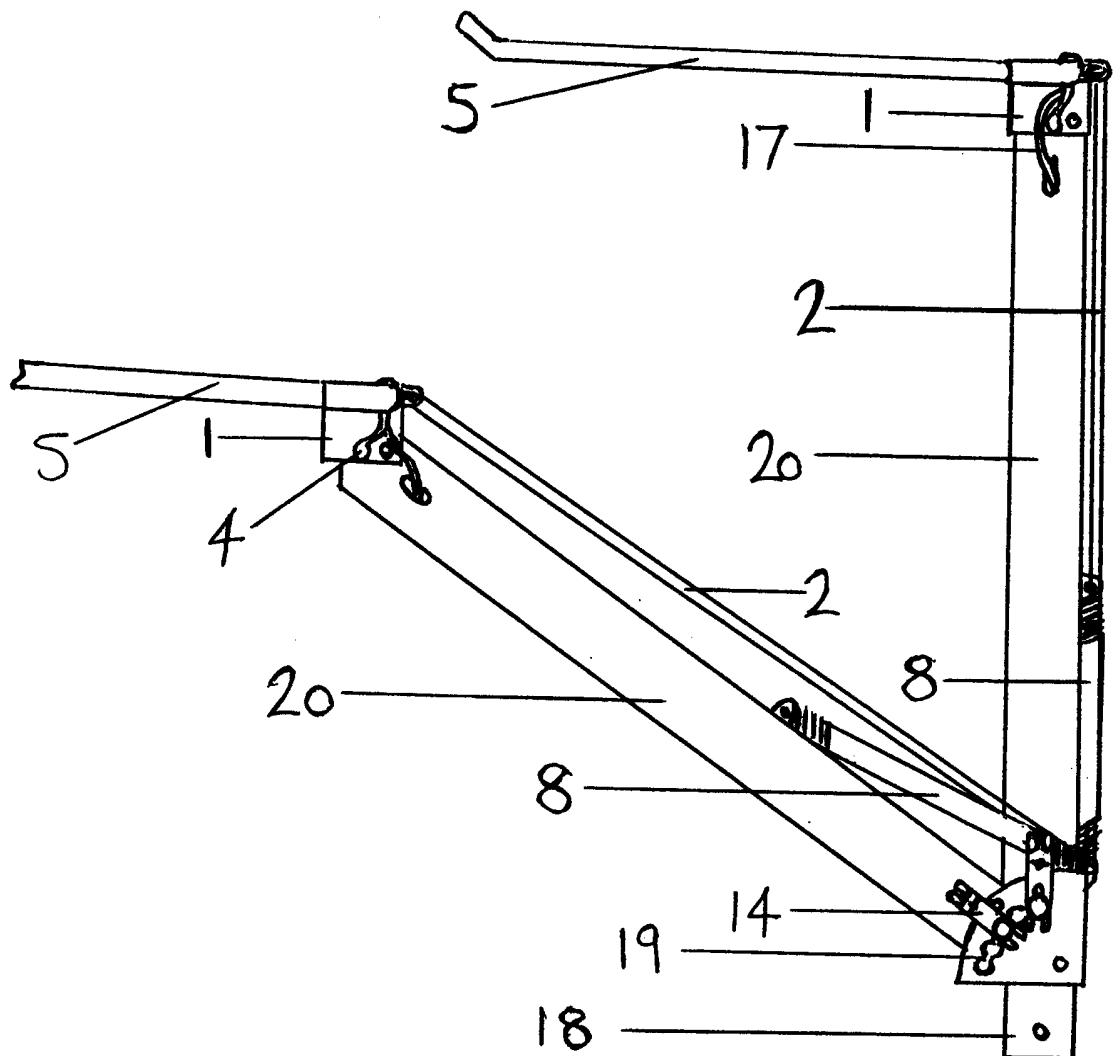


Fig 7



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Fig 8



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Fig 9

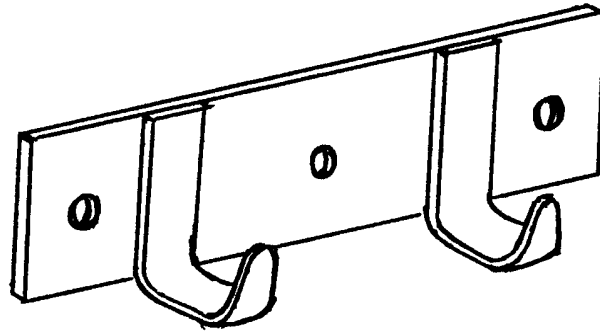
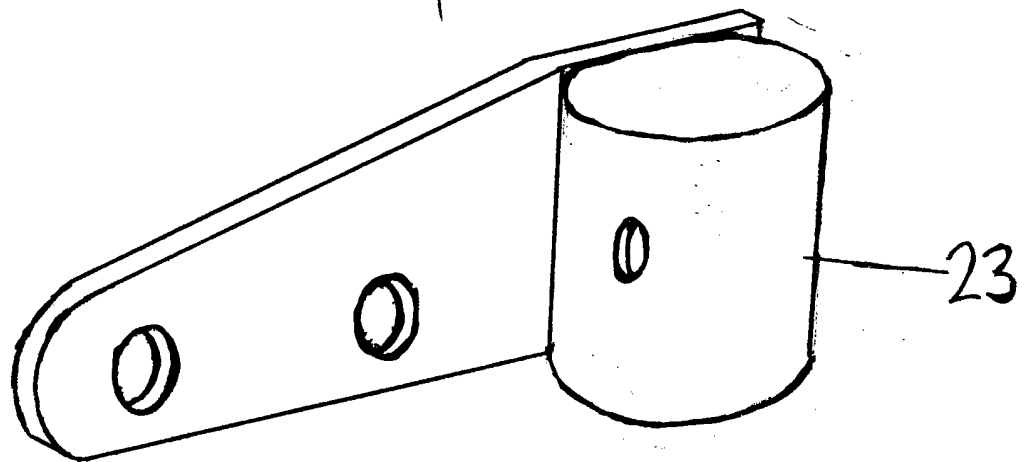
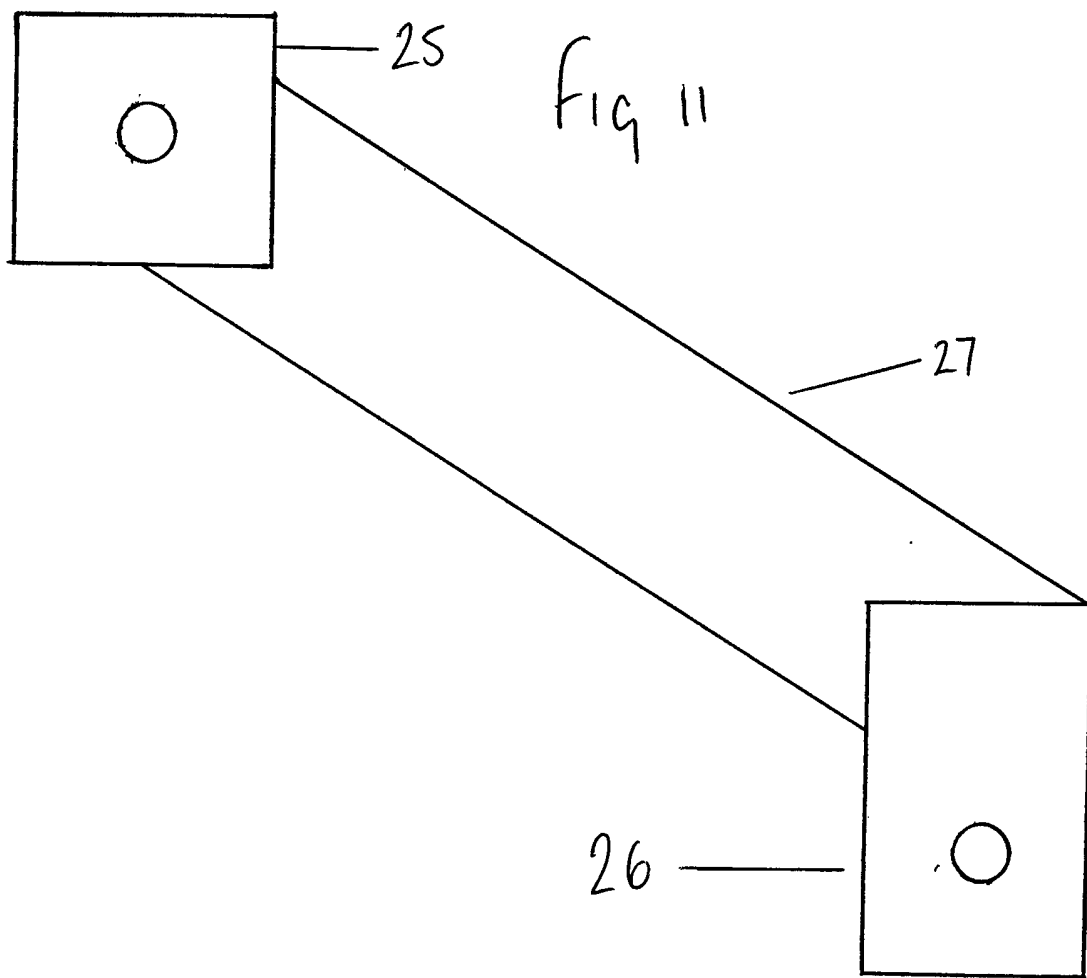


Fig 10



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CYCLE RACK

This invention relates to a towbar mounted cycle rack, which includes cycle supports such as shaped bent tubing welded to a pivoting head

Such cycle racks are common but suffer from the disadvantage that, when they are mounted on the vehicle, the user is then unable to access the boot space, without first removing the cycles and also the cycle rack itself.

An object of this invention is to provide a cycle rack that can be fitted to most vehicles with towbars of which access to bootspace is required.

Accordingly this invention provides a towbar mounted cycle rack with a five-position-locking pivoting base which also swivels in its mount allowing access to most vehicles boot space even whilst towing, without removal of cycles or cycle rack. Hatchbacks, multipurpose and offroad vehicles with the aid of the rear door mounted spare wheel extension.

Preferably the cycle rack would be made of a light strong material such as aluminium or mild steel.

A preferred embodiment of the invention will now be described with reference to the accompanying drawings in which

FIG 1: Shows a complete left side view of the cycle rack.

FIG 2: Shows a complete right side view of the cycle rack.

FIG 3: Shows a complete rear view of the cycle rack.

FIG 4: Showing the front view of the whole unit. Cycle carrying supports (5). Self levelling head (1). Position locking mechanism operation lever (4). Pivoting upright (20). Locking mechanism operation cable (17). Locking mechanism operation cable access window (23). Travel safety pin (10). Position locking mechanism base (19). Rack mount (18).

FIG 5: Shows a view of the upper section pivoting, self levelling head (1) self levelling rod (2) position assisting handle (3) and position locking mechanism operation lever (4). Cycle carrying supports (5)

FIG 6: As in FIG 5: showing strengthening tubes (6) and (7), (7) incorporating position assisting handle (3) and position locking mechanism operating lever (4). Strengthening tubes (6) and (7) will also be used to mount the complete cycle rack to the garage wall for cycle hanging storage, with the use of mounting bracket (FIG 9) to be supplied with cycle rack at purchase.

FIG 7: Showing an exploded view of Position locking mechanism: Self levelling rod (2). Operation assisting springs (8). Locking mechanism pivoting pin (9). Travel safety locking pin (10). Locking mechanism operation pin (11). Locking mechanism operation pin manoeuvre nut (12). Self levelling rod (2) and operation assisting springs fixing pin (13). Locking mechanism activation lever (14). Locking mechanism activation lever rocker (15). Locking mechanism activation lever mounting pin (16).

Locking mechanism operation cable (17). Rack swivelling mount (18). Position locking mechanism base (19). Pivoting upright (20). Operation assisting springs upright mounts (21). Operation assisting springs upright fixing pins (22).

FIG 8: Shows how the rack looks from a left side view of rack in locked travelling position, to locking position 2.

FIG 9: Rack garage storage wall mount.

FIG 10: Towbar rack mount. (23). 18 would slot into 23 and locked in place with pin and clip.

FIG 11: Rear door mounted spare wheel extension (27)

CYCLE RACK

This cycle rack is conceived from an idea I had back in 2000 and am now just going ahead with patent application.

This cycle rack is very quick and easy to fit to the vehicle. Once the vehicle has been fitted with the towbar-mounting bracket (Fig: 10). The rack is left complete and is fitted into place on the vehicle by slotting 18. Into swivel mounting 23 (fig 10). And locking into place with pin 24. Once locked into place on the vehicle it can be easily operated.

To operate the rack you first remove the travel safety-locking pin 10. Then depending On the type of vehicle the rack is fitted to, or if the vehicle is towing such as a trailer or caravan, the locking pin 23 can be removed from the swivel mount (fig 10). When the vehicle is parked only. Allowing the complete cycle rack to pivot and swivel through 180° simultaneously whilst operating. Standing to the left of the rack, holding position assisting handle 3. Depressing the position locking mechanism lever 4. Which in turn pulls the locking mechanism operation cable 17. The locking mechanism activation lever 14. Functions, pulling the locking mechanism operation pin 11. Unlocking the rack pivoting upright 20.

The pivoting upright can then be lowered away from the vehicle, whilst swivelling allowing the user to position the rack and cycles to either side of the vehicle and unit being towed. Weight transfer being assisted by the operation assisting springs 8. Releasing the position locking mechanism lever 4. And selecting the required position allowing the rear boot/door of the vehicle to open gaining access. All of course without removing cycles being carried or cycle rack. Locking pin 23 would be in place at all times while the rack is fitted to the vehicle and only removed for operating around units being towed.

The rack is lightweight, strong and will carry up to four cycles of any size including Y frame cycles.

Vehicles fitted with rear door mounted spare wheels would use removable extension 27 fig 11. The extension 27. Of which 26 would fit into towbar rack mount 23 fig 10 allowing the rack mount 18 to fit into 25 of the extension. Thus allowing for door mounted spare wheel.

Claims.

1. A cycle rack including five positions pivoting base and a one to four cycle carrying supports on a pivoting head.
2. A cycle rack as claimed in 1 where the pivoting base mount is able to swivel through 180°
3. A cycle rack as claimed in 2. where the pivoting head is connected to the pivoting base with an upright post.
4. A cycle rack as claimed in 1, 2 and 3 where a hand operated lever is depressed, pulling on a steel cable disengaging a locking mechanism in the pivoting base, allowing an upright post to pivot and or swivel with the aid of springs assisting with weight transfer.
5. A cycle rack as claimed in 3 where when the pivoting base is unlocked and operated, the pivoting head also being connected to the base by means of a rod running vertically with the upright post, keeps the pivoting head horizontal with the base in all positions, allowing cycles being carried to hang vertically giving safe standing room between cycles and boot space.
6. A cycle rack as claimed in any proceeding claim, which would be made from aluminium or mild steel.
7. A cycle rack substantially as herein described and illustrated in the accompanying drawings.

4.

Amendments to the claims have been filed as follows

1. A cycle carrying rack with a base in which the upright post is able to pivot and lock in five separate positions at different degrees of angle, a head with cycle carrying mounts which are kept horizontal in all positions with the aid of a rod connected to the head and base running parallel with the upright post.
2. A cycle rack as claimed in 1 where the complete cycle rack is also able to swivel in its vehicle towbar mount through 180 degrees whilst locked into any one of its five degrees of angle locking positions.
3. A cycle rack as in claim 2 where a hand operated lever is depressed pulling on a steel cable disengaging a locking mechanism in the base, allowing the upright post to pivot with the aid of springs connected to the upright post and base to assist with weight transfer.
4. A cycle rack as claimed in any proceeding claim, which would be made from aluminium or mild steel.
5. A cycle rack substantially as herein described and illustrated in the accompanying drawings.



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Application No: GB0508283.9

Examiner: Barnaby Wright

Claims searched: 1-7

Date of search: 15 August 2005

Patents Act 1977: Search Report under Section 17**Documents considered to be relevant:**

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1, 2, 6, 7	US 6199735 B1 (COTHERN) See whole document, especially figures 1-4.
X,Y	X: 1, 6, 7; Y: 2 at least	WO 02/24481 A1 (VIGOR) See whole document, especially figures 1-7.
X,Y	X: 1, 6, 7; Y: 2 at least	US 5658119 A (ALLSOP) See whole document, especially figures 1-4.
X,Y	X: 1, 6, 7; Y: 2 at least	US 5730345 A (YECKLEY) See whole document, especially figures 1-4.
Y	2 at least	US 6722380 B1 (HAFER) See whole document, especially figures 1-4.
Y	2 at least	US 5518159 A (DEGUEVARA) See whole document, especially figures 1-3.
A	-	US 5330084 A (PETERS) See whole document, especially figures 1-8.
A	-	US 6129371 A (POWEL) See whole document, especially figures 1-4.
A	-	US 5685469 A (STAPLETON) See whole document, especially figures 1-7.

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.



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Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

B7J

Worldwide search of patent documents classified in the following areas of the IPC⁰⁷

B60R

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC